34th Annual Congress of BESEDIM (Belgian Society Emergency & Disaster Medicine)

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Table of contents

Welcome to the 34th Annual Congress of BESEDIM (Belgian Society Emergency & Disaster Medicine)

Emergency & Disaster Medicine are young and evolving specialities, crucial to healthcare. A lot of exciting research is being done and with this abstract book we tried to provide forum to all Belgian colleagues. The abstracts presented here are relevant however to all working in Emergency & Disaster Medicine, far beyond the Belgian borders.

LIST OF ORGANIZERS

BESEDIM

Outcome, compliance with inclusion criteria and payer-of-healthcare costs of extracorporeal cardiopulmonary resuscitation (ECPR) in out-of-hospital cardiac arrest: A retrospective cohort study

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Introduction

Sudden cardiac arrest is the third leading cause of death in Europe. Survival from out-of-hospital cardiac arrest (OHCA) has remained low for the past decades and depends largely on early and high-quality cardiopulmonary resuscitation (CPR). [1-2] Extracorporeal cardiopulmonary resuscitation (ECPR) refers to the implementation of veno-arterial Extracorporeal Life Support (ECLS) during cardiac arrest. There remains uncertainty about the

efficacy of ECPR in adults and its use raises moral dilemmas. [3] Applying advanced life-sustaining treatments in patients with poor long-term prognosis, high comorbidity and poor pre-arrest quality of life may lead to futile and inappropriate care. [4] Furthermore, there is a constant challenge to maximise health benefits with the resources available, mandating the assessment of the cost-effectiveness of new therapies. [5] There is a need to critically evaluate whether ECPR is an appropriate intervention, and which patients would benefit most of ECPR. The primary aim of the current study was to describe the outcome, the compliance with inclusion criteria and the characteristics of patients who underwent ECPR for OHCA. The secondary aim of this study was to conduct an exploratory cost assessment to gain insight into the medical costs related to ECPR for OHCA.

Methods

Single-centre retrospective cohort study. We included all patients who were admitted to the emergency department (ED) of Antwerp University Hospital from 2018 to 2020 and who received ECPR for OHCA. Medical records were assessed to determine patient demographics, information concerning the cardiac arrest and the clinical outcome. Invoices were assessed to calculate the charged fees for each individual patient. This cost evaluation was performed from a patient's perspective, costs covered by the hospital were not included in the analysis. We collected all relevant cost components at the most detailed level (micro costing technique).

Results

Sixty-five patients who received ECPR for OHCA were included. Thirty-eight patients (58%) died within one week after ECPR. After one year, twelve patients (18.5%) were still alive of which ten (15.4%) had a good neurological outcome (Cerebral Performance Category (CPC) 1 or 2). Forty-nine patients (75.4%) met the ECPR inclusion criteria (Figure 1). A total of 2,552,498.34 euro was charged to patients and public healthcare. The patients and the Belgian healthcare system paid 255,250 euro for each survivor after one year with good neurological outcome Table 1.

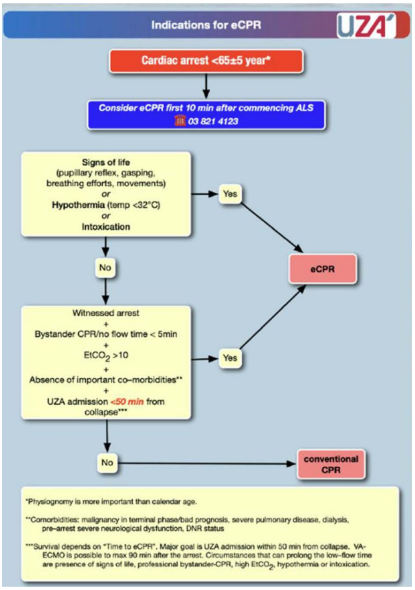

FIGURE 1
Inclusion criteria ECPR.

TABLE 1: Cost & outcome

				Compliance with ECPR criteria				Total	
		No	Yes	Unknown					
		Cost	%	Cost	%	Cost	%	Cost	%
One year survival	No	475,326.91	18.6	1,237,941.03	48.5	25,261.88	1.0	1,738,529.82	68.1
	Yes	25,210.36	1.0	686,358.23	26.9	102,399.93	4.0	813,968.52	31.9
Good neurological outcome after one year	No	475,326.91	18.6	1,358,222.01	53.2	25,261.88	1.0	1,858,810.80	72.8
	Yes	25,210.36	1.0	566,077.25	22.2	102,399.93	4.0	693,687.54	27.2
Total		500,537.27	19.6	1,924,299.26	75.4	127,661.81	5.0	2,552,498.34	100

Discussion

Our analysis highlights the complex interplay between clinical efficacy and financial implications inherent in the utilization of extracorporeal cardiopulmonary resuscitation (ECPR). While ECPR demonstrates potential in improving survival rates and neurological outcomes among cardiac arrest patients, its adoption presents substantial economic challenges for healthcare systems.

References

[1] Grasner, J.T., et al., *Survival after out-of-hospital cardiac arrest in Europe - Results of the EuReCa TWO study.* Resuscitation, 2020. **148**: p. 218-226.

[2] Kiguchi, T., et al., *Out-of-hospital cardiac arrest across the World: First report from the International Liaison Committee on Resuscitation (ILCOR).* Resuscitation, 2020. **152**: p. 39-49.

[3] Scquizzato, T., et al., *Refractory out-of-hospital cardiac arrest and extracorporeal cardiopulmonary resuscitation: A meta-analysis of randomized trials.* Artif Organs, 2023.

[4] Kompanje, E.J., R.D. Piers, and D.D. Benoit, *Causes and consequences of disproportionate care in intensive care medicine.* Curr Opin Crit Care, 2013. **19**(6): p. 630-5.

[5] Cox, H.L., K.B. Laupland, and B.J. Manns, *Economic evaluation in critical care medicine.* J Crit Care, 2006. **21**(2): p. 117-24.

Bereavement care in the emergency department – A valuable, but under used practice

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Citation

Adriaenssens, K., Henry, R., Bánki, B. Bereavement care in the emergency department – A valuable, but under used practice.

Introduction

Unexpected death at the emergency department (ED) is a catastrophic event for those left behind. Immediate grief reactions include shock and denial, whereas long term reactions include depression and an increased morbidity and mortality risk. Additionally, unexpected death at the ED marks the beginning of a period with a significant risk of complicated grief. Bereavement care (BC) is the practice to facilitate and help those left behind to go on with life in a new normal. Yet, BC differs widely between hospitals as it does not constitute a standardized protocol. Also, there are unique characteristics associated with the ED that hamper the delivery of effective BC. The aim of this study is to summarize the current literature of BC and to draw attention to its obstacles.

Methods
A narrative review of the literature by means of a PUBMED search (year 1990 onwards; MeSH terms: Bereavement or Grief and ED and Adults not Palliative Care) that identified 13 articles out of 121 results that fulfilled the search criteria.

Results
All articles retrieved acknowledged the importance of BC after death at the ED. Seven particularly stressed its surplus (psychological) value. Six articles recommended a necessary multidisciplinary approach, and over half suggested that a longitudinal follow up program might be even more beneficial to those left behind. Three articles paid attention to its cost-effectiveness (high) and feasibility (high). Factors complicating BC were amongst others the ED-setting itself, the absence of a standing relationship with the attending physicians and a lack of BC educational training programs. Overall, the literature showed that, although BC was highly valued and beneficial, it was under used in clinical practice. Additionally, despite the fact that its useful elements were identified a guideline on standardized approach to BC at the ED is missing. Finally, the literature states that BC is most likely also beneficial to ED staff.

Discussion
With this review we want to raise awareness about the importance of BC after unexpected death at the ED for those left behind, but also for ED staff. Most strikingly is the fact that the unique circumstances of unexpected ED death leave those left behind vulnerable to an increased complicated grief risk. A risk that may be diminished by standardized BC programs. Apart from the fact that BC programs fit good clinical practice. We want to emphasize the guideline void on BC. Finally, further outcome research on BC is warranted.

Post Scriptum
In our hospital death at the ED occurs roughly once every week. Since January 2022 we started a standardized multidisciplinary BC program partly

based upon the literature presented here. In short, after demise at the ED those left behind receive a hand written card of condolence within the same week and are offered bereavement care after six weeks. This initially start with a visit to our ED and consists of a counseling session(s) based upon the needs of the bereaved. If necessary additional (primary) disciplines are being involved. This program is currently under evaluation.

An equivalent STEMI ECG: The de Winter complex

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Citation
Baugnon, J., Manara, A. An equivalent STEMI ECG: The de Winter complex.

Introduction

The de Winter ECG complex described in 2008 by RJ de Winter appears in 2% acute anterior myocardial infarctions (1). It is crucial to recognize it in emergency medicine to activate the coronary angiography room for a primary angioplasty.

Clinical Case

A 70-year-old man calls 112 for a retrosternal chest pain evolving for 30 minutes with nausea, diaphoresis and lipothymia following Sildenafil intake. He has a medical history of left anterior descending artery (LAD) angioplasty and he is on acetylsalicylic acid therapy. He is pre-obese (BMI 27.4 kg/m2). The clinical examination is otherwise unremarkable. The electrocardiography (ECG) shows a sinus rhythm and an abnormal repolarization: thin QRS, ST-segment upsloping depressions, tall and symmetrical T-waves in leads V2 to V5 and a 2 mm ST-segment elevation in aVR (figure 1). This tracing is named de Winter pattern: this is an equivalent ST-elevation myocardial infarction (STEMI) ECG. The coronary angiography shows at the level of LAD: an acute occlusion of the ostium and an insignificant lesion of the first diagonal with the presence of a collateral circulation from the right coronary artery.

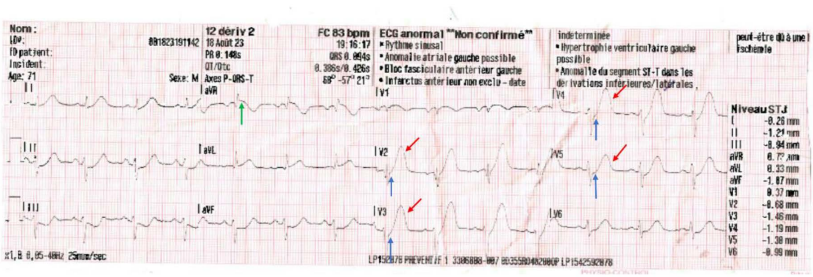

FIGURE 1

ECG of the patient: The de Winter pattern.

ST-segment upsloping depression

Tall and symmetrical T wave

ST-segment elevation

The patient is treated with primary angioplasty of the proximal LAD with implantation of an active stent and the de Winter pattern disappears. He is discharged on day 4.

Discussion

This ECG doesn't show the academic criteria for STEMI but a de Winter complex.

It indicates a coronary (sub)occlusion and requires recognition to prompt urgent angioplasty. However, it still doesn't appear in the recommendations for the management of acute coronary syndromes.

This complex is more common in young, hypercholesterolemic, with no heart failure men (2).

It has on early onset and remains present for several hours. It disappears after revascularization, nevertheless without treatment it can evolve to an ECG with typical STEMI criteria (1,2). It has a high positive predictive value (>95.2%) for the LAD acute coronary occlusion (3).

It is defined by: an ST-segment upsloping depression (1-3mm) at the J point with tall, positive symmetrical T waves in leads V1 to V6 and an absence of ST-segment elevation except in aVR (1-2mm). There may exist a planing of the R waves or QRS fragmentation (1).

The electrophysiological explanations are (4):

In acute ischemia: there is a delay in conduction in the sub-endocardial area because the endocardium is more susceptible to ischemia than the epicardium. Sub-endocardial cells are more depolarized in diastole, leading to an upward shift in the ECG baseline. The posterior-lateral part of the left ventricle depolarizes first, the R wave is shifted. Voltage differences of the action potential (AP) between endocardium and epicardium induce ST-segment depression. The sub-endocardial AP repolarizes faster creating tall T-waves.

Several pathophysiological hypotheses have been put forward (1,2): an anatomical variant of the Purkinje fibers; the absence of activation of ATP-sensitive potassium channels; a collateral circulation with a sufficient quality of the downstream vascular bed.

Conclusion
The de Winter ECG complex remains underrecognized. Identifying it is essential to make a no-delay diagnosis of acute myocardial infarction and urgently a coronary angiography and primary angioplasty.

Bibliographie

(1) de Winter, R.J., Verouden, N.J., Wellens, H.J., Wilde, A.A., Interventional Cardiology Group of the Academic Medical C. A new ECG sign of proximal LAD occlusion. N Engl J Med, 2008, 359 (19), 2071-2073

(2) Verouden, N.J., Koch, K.T., Peters, R.J., Henriques, J.P., Baan, J., van der Schaaf, R.J., et al. Persistent precordial "hyperacute" T-waves signify proximal left anterior descending artery occlusion. Heart, 2009, 95 (20), 1701-1706.

(3) MorrisNP, BodyR. The De Winter ECG pattern : morphology and accuracy for diagnosing acute coronary occlusion: systematic review. Eur J Emerg Med. 2017;24(4):236–42.

(4) Gorgels, A.P. Explanation for the electrocardiogram in subendocardial ischemia of the anterior wall of the left ventricle. J Electrocardiol, 2009, 42 (3), 248-249.

Discomfort and convulsions in a child: Rare case of late erosion of an atrial septal defect prosthesis

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Citation
Baugnon, J., Manara, A. Discomfort and convulsions in a child: Rare case of late erosion of an atrial septal defect prosthesis.

Introduction

Atrial septal defects (ASD) represent 10% of congenital heart diseases. The reference treatment for ASD ostium secundum is percutaneous prosthesis implantation with a high success rate (>95%). Very rare complications need to be recognized and treated urgently.

Clinical Case

A mother calls 112 because her 12-year-old daughter is unconscious and convulsing. The child had a percutaneous closure of an ASD 8 months ago, followed by anti-thrombotic treatment and prophylactic antibiotics for endocarditis for 6 months.

On clinical examination, the child is pale with perioral cyanosis, apyretic, tachycardic, her blood pressure is pinched, her Glasgow is 14 (E3M5V6). Secondly, a left hemiparesis appears.

Electrocardiogram shows a regular sinus rhythm, blood gases a metabolic acidosis with hyperlactatemia, chest X-ray a cardiomegaly with signs of pulmonary oedema, cerebral magnetic resonance a diffusion restriction in the left cerebellar lobe compatible with a stroke, electroencephalogram is normal. Echocardiography reveals thrombi on the prosthesis and a large pericardial effusion (>3cm) causing pre-tamponade, prompting emergency pericardiocentesis. Surgery is performed to remove the prosthesis that is the site of aortic erosion and to close the ASD with a patch. The evolution is satisfactory, the child leaves intensive care on day 3.

Discussion

ASD is a defect in the atrial septum whose topography defines the type: primary ostium (15% ASD), ostium secundum (80%), sinus venosus (<5%) and coronary sinus. (1)

It produces a left-to-right shunt causing right overload progressing to right ventricular failure and pulmonary arterial hypertension (PAH). (1)

The diagnosis is suggested by a meso-systolic murmur at the pulmonary focus with splintting of B2, sometimes symptoms: respiratory infections, growth retardation, dyspnea, arrhythmia, stroke. (1)

Echocardiography confirms the ASD, its type, margins, cardiac repercussions.

Closure of the ASD is indicated for significant shunting, right ventricular dilatation, symptoms or complications. It will be more effective if performed early (< 25 years), before PAH. (2)

The treatment is surgery or for 80% ostium secundum ASDs with margins > 5 mm percutaneous treatment with insertion of a prosthesis. (2) First performed in 1976 by King and Mills, it is as effective as surgery with lower morbidity. (3)

Complications are very rare and require surgical revision in 8% cases: (3,4,5)

- Prosthesis migration (0.8% cases) favored by a too large defect or prosthesis, margins < 5 mm, occurs post-procedure
- Prosthesis malposition is observed immediately post-procedure
- Cerebral or peripheral thrombi (1.2% cases), related to gas embolism during procedure, are often regressive.
- Prosthesis thrombi generally disappear with anticoagulant or required surgery
- Prosthesis erosion (0,1% cases), located at the atrial roof, causing tamponade, favored by an oversized prosthesis, occurs in the week following implantation.
- Traumatic perforation by a guide appears during the procedure.
- Rhythmic complications (10% in the first six months) are more frequent in the elderly patients.
- Cardiac dysfunction (0.65% cases) can present as heart failure
- Endocarditis is rare thanks to prophylactic antibiotics.

Conclusion

Percutaneous closure of ASDs follows strict recommendations. Innovative advances in prosthetic have reduced complications. Echocardiography monitoring is used to check the effectiveness of the prosthesis and prevent the occurrence of cardiological emergencies.

Bibliography

(1) Houyel L. (2002) Communications interauriculaires. In: Encyclopédie médico-chirurgicale - Cardiologie. Elsevier Masson Ed., Paris, 11-940-C-20:8 3. Brickner ME, Hillis LD, Lange RA (2000) Congenital heart disease in adults. First of two parts. N Engl J Med 342:256–63

(2) Baumgartner H, De Backer J, Babu-Narayan SV, et al (2021) 2020 ESC Guidelines for the management of adult congenital heart disease. Eur Heart J 42: 563–645

(3) Dehghani H., Boyle AJ. Percutaneous device closure of secundum atrial septal defect in older adults. Am J Cardiovasc Dis. 2012 ; 2(2) : 133–142.

(4) Aubry P., Brochet E., Juliard J–M. Fermeture percutanée des communications interauriculaires de l'adulte. Journal Marocain de Car- diologie IV (2011).

(5) Chessa M, Carminati M, Butera G. Early and late complications associated with transcatheter occlusion of secundum atrial septal defect. J Am Coll Cardiol 2002;39:1061-5.

Aortic root dissection mimicking acute pericarditis: As one danger may hide another one

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Benoit, M., Lebecque, O., Berners, Y., Luchian, M-L., Higny, J. Aortic root dissection mimicking acute pericarditis: As one danger may hide another one.

Introduction

Acute chest pain assessment in emergency department (ED) are common but not always easy task. We report a case of a clinically convincing picture of acute pericarditis hiding a limited dissection of an enlarged aortic root.

Case Presentation

A 17 - year old patient presented in ED on Saturday night with breathing-dependent, positional and NSAID responsive chest pain for almost 24 hours. The patient also described recent throat soreness and runny nose without fever. He had experienced a transient acute chest pain during intense exercise a few days earlier. Thoracic examination suggested pericardial friction rub. The EKG displayed sinus rhythm with normal QRS and slight diffuse ST-segment elevation (figure 1). Chest X-ray was considered normal. Lab results showed mildly elevated C-reactive protein (CRP 41 mg/dl), troponins were normal. POCUS (point-of-care ultrasonography) showed no pleural effusion nor left or right heart dysfunction. Pain was relieved by

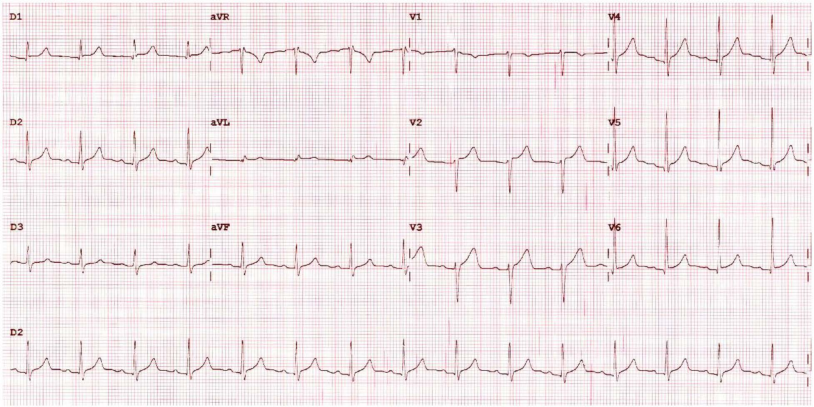

FIGURE 1
EKG with slight diffuse ST-segment elevation.

high dose aspirin. Though state-of-art transthoracic cardiac ultrasonography showed significantly enlarged aortic root enlargement without any effusion (figure 2). Mild central aortic regurgitation is noted. Transesophageal ultrasonography confirmed enlarged aortic root without evident false lumen though suggesting limited effusion in the pericardial transverse sinus of Thiele (1) (figure 3). Thoracic angioCT could detect limited intimal tear in the dilated proximal ascending aorta (figure 4). Acute aortic limited intimal tear is a rare entity of acute aortic syndromes carrying similar prognosis (2). The patient underwent urgent aortic root repair by Tirone David technique. Surgical examination confirmed the intimal tear. He was discharged 6 days later. Clinical pattern suggested Marfan syndrome. Genotype established type I Loeys-Dietz syndrome (heterozygous mutation of TGFBR1) a few months later. Acute chest pain in emergency department are common yet challenging. Even though minimal viral infection signs were misleading, we believe that earlier exercise-triggered intimal tear in the aortic root may have induced local edema and delayed pericardial syndrome that are described as being a clinical picture of aortic dissection (3-5).

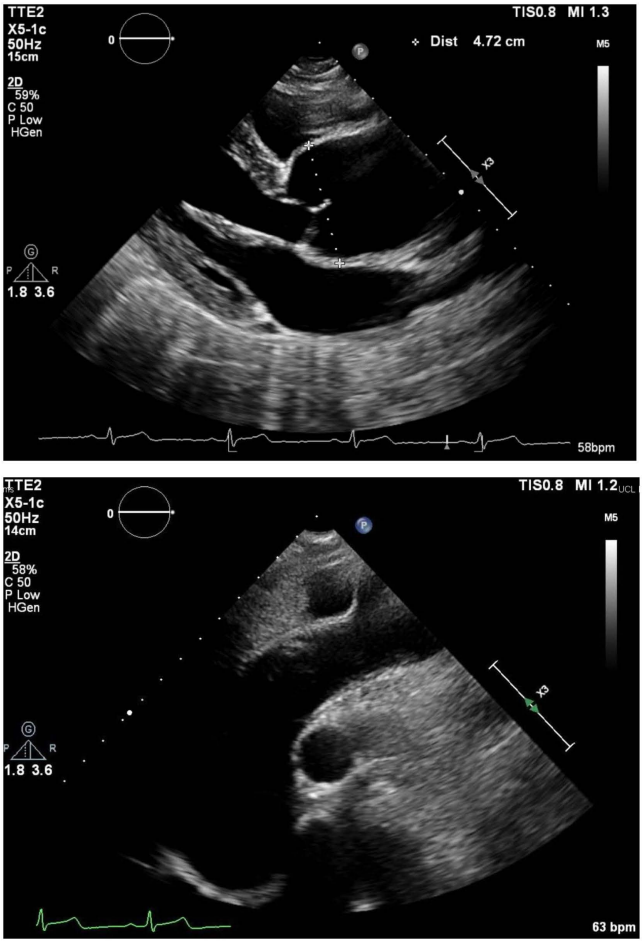

FIGURE 2

Transthoracic cardiac ultrasonography showing significantly enlarged aortic root enlargement (**a**: parasternal long axis view, **b**: suprasternal view) while aortic arch remains normal.

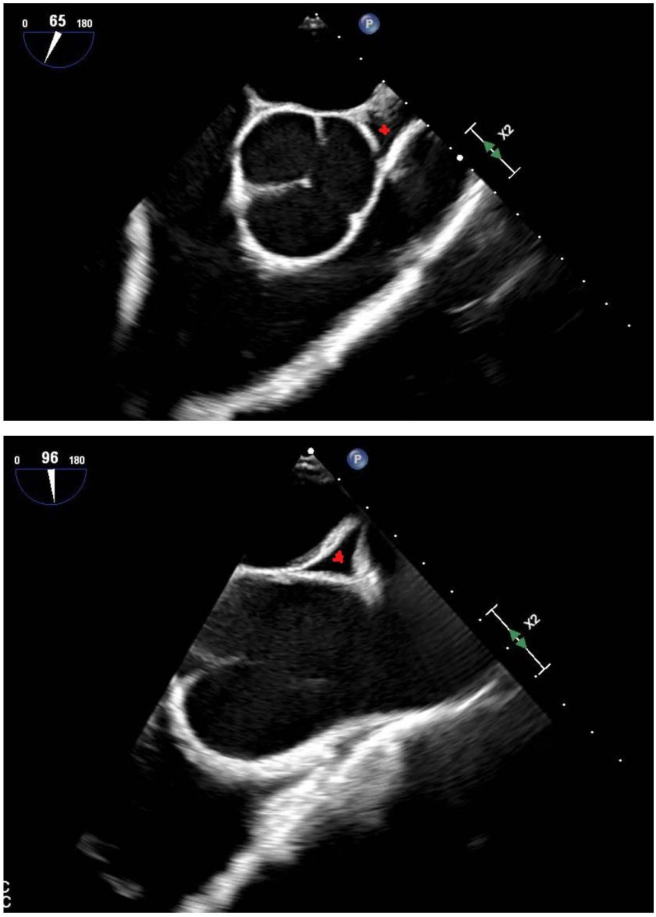

FIGURE 3
TEE mid-esophageal view showing enlarged aortic root as minimal effusion in the pericardial transverse sinus of Thiele (asterisk) (**a**: 65 °, **b**: 96).

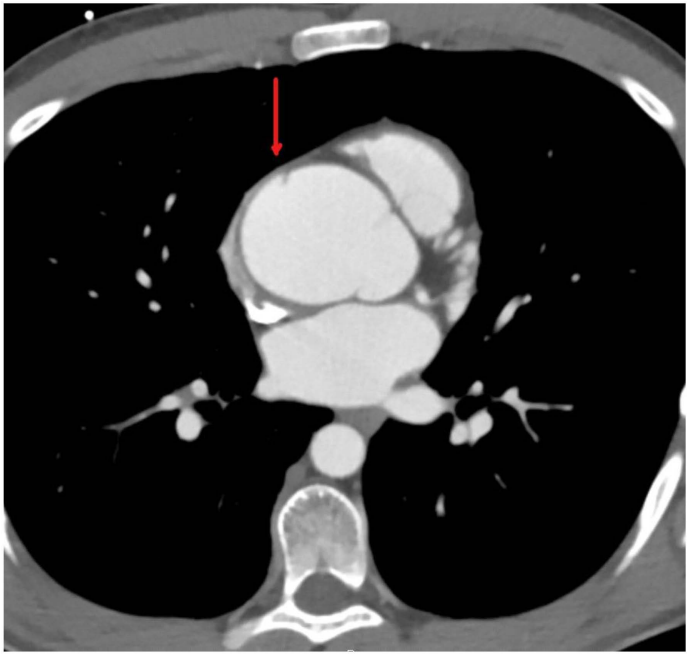

FIGURE 4
Thoracic angioCT showing limited intimal tear in the dilated proximal ascending aorta (arrow).

Conclusion

This case highlights the importance of thorough clinical and sonographic examination in acute chest pain or pericarditis as it guides to rule out differential diagnosis of the highest importance.

References

(1) Penmasta S, Silbiger JJ. The transverse and oblique sinuses of the pericardium: Anatomic and echocardiographic insights. Echocardiography. 2019; 36: 170–176.

(2) Mohammad H. Madani, Valery L. Turner, Richard L. Hallett, Martin J. Willemink, Horacio Murillo, Anne S. Chin, Gerald J. Berry, and Dominik Fleischmann; Limited Aortic Intimal Tears: CT Imaging Features and Clinical Characteristics; Radiology: Cardiothoracic Imaging 2022 4:6

(3) Greenberg DI, Davia JE, Fenoglio J et al.. Dissecting aortic aneurysm manifesting as acute pericarditis. Arch Intern Med 1979;139:108–9

(4) Suchdeep Raj Bains, Anita Kedia, Carlos A. Roldan; Pericarditis as initial manifestation of proximal aortic dissection in young patients, The American Journal of Emergency Medicine,Volume 26, Issue 3, 2008

(5) Soyer H. Acute pericarditis: a presenting manifestation of aortic dissection. BMJ Case Rep. 2016 Jun 28;2016:

Hyperthermia following clozapine-initiation - A case report

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Citation
Bruneel, E., Vanbrabant, P. Hyperthermia following clozapine-initiation - A case report.

Background

Clozapine is an atypical antipsychotic drug that is used in the treatment of refractory schizophrenia. Elevated body temperature is a common side effect, which usually occurs in the first four weeks of treatment.[1]

Case Presentation

A 49-year old male patient was referred to the ED because of elevated body temperature since a couple of weeks.

Patient first presented three weeks ago, with fever, dysuria and a sore throat. On laboratory findings patient had a C-reactive protein (CRP) of 214 mg/L, and urine culture showed E faecalis. Patient was treated with Augmentin for five days. At referral, patients has had daily fever, up to 38.2°C for a week. He had general malaise and weakness, and reflux. There were no abnormalities on clinical examination, other than tachycardia at 110 bpm. A new blood analysis showed a CRP of 65 mg/L, and leucocytosis with neutrophilia. CK, kidney function and liver function tests were within range. The other

diagnostic work-up, including ECG, urine culture, haemocultures, chest X-Ray and abdominal ultrasound showed no abnormalities.

In the patient history there is diabetes, hypogammaglobulinemia, schizophrenia, psychosis and an eating disorder. The patients has been started on clozapine two weeks ago.

No antibiotics were started, clozapine was continued, and fever subsided spontaneously during admission on the internal medicine ward.

Discussion

There are several reasons why patients on clozapine can present with elevated body temperature: neuroleptic malignant syndrome, heat stroke, concurrent infection (especially pneumonia), clozapine-induced inflammation (lupus, myositis, serositis, hepatitis, pancreatitis, nephritis, colitis) and clozapine-induced fever. Clozapine can be associated with neutropenia, which can present with fever as its only symptom. [2]

It is a priority to rule out concurrent infections, NMS, agranulocytosis and myocarditis. Other causes of inflammation should be eliminated before a diagnosis of clozapine induced fever can be made. Only in the latter case it is considered safe to continue clozapine. It is typically characterized by a mild grade fever, with a mean onset of two weeks after clozapine initiation, and lasts about one week. [3]

Adverse drug reactions after initiation of clozapine are often associated with rapid titration, concomitant use of other antipsychotic drugs and valproate and physical illness. [3]

Conclusions

Fever is a common adverse drug reaction in clozapine use.[1] Although short episodes of benign fever are frequent in the first weeks of its use, it is important to rule out potentially lethal adverse drug reactions, and to exclude infection and other medical causes.[2] It is important to recognize either, so

that a correct decision to continue or discontinue clozapine use can be made. As an ED-physician it is important to recognize all causes of elevated body temperature, including drug-induced hyperthermia and fever.

References

[1] Røge R, Møller BK, Andersen CR, Correll CU, Nielsen J. Immunomodulatory effects of clozapine and their clinical implications: what have we learned so far? Schizophr Res. 2012;140(1-3):204–213.

[2] Verdoux H., Quiles C., de Leon J. Clinical determinants of fever in clozapine users and implications for treatment management: A narrative review. *Schizophr Res*. 2019;211:1-9.

[3] Pui-yin Chung J, Shiu-yin Chong C, Chung KF, Lai-wah Dunn E, Wai-nang Tang O, Chan WF. The incidence and characteristics of clozapine-induced fever in a local psychiatric unit in Hong Kong. *Can J Psychiatry*. 2008;53(12):857-862.

Ventilation in cardiac arrest: Provider attributed differences in a computer-simulated CPR model

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Citation
Carlens, I., Olmen, D.V., Guldentops, J., Boef, M.d., Sabbe, M., Genbrugge, C., Stiers, M. Ventilation in cardiac arrest: Provider attributed differences in a computer-simulated CPR model.

Introduction

Invasive mechanical ventilation with a bag-valve is used during cardiac arrest, which remains a major global challenge.(1) The pulmonary component of cardiopulmonary resuscitation (CPR) is as important as is the cardiac one, in optimizing the delivery of oxygen-rich blood to the brain. Manuel ventilation with the bag-valve is frequently used in Belgium.(2) This bench study aims to evaluate the manual mechanical ventilation technique among healthcare workers at a tertiary center emergency department (ED) during respiratory arrest and CPR to gain a deeper understanding of the ventilation parameters associated with this device.

Methods

This bench study was conducted at the UZ Leuven Emergency Department following ethical approval. The setup included a bag-valve device (Ambu Mark IV, Ambu, Denmark) with a PEEP valve set at 5 cmH_2O, connected to a lung simulator (ASL5000, IngMar Medical, Pittsburgh, USA). A CPR compression model was developed to simulate intrathoracic pressures during thoracic compressions, featuring both compressive and passive recoil phases with pressures of 16 cmH_2O and -4 cmH_2O, respectively, at a frequency of 100 compressions per minute. Participants (n=59) were recruited to manually ventilate a simulated adult (IBW 70 kg) for four minutes in four different scenarios: 1) respiratory arrest, 2) cardiac arrest with synchronous CPR, and scenarios 3) and 4) standardized for respiratory rate using a metronome (10 bpm) and one-handed manual ventilation. The primary endpoints measured included ventilation rate, tidal volume, inspiratory time, expiratory time, and peak airway pressure. A mixed linear modal was used for statistical testing including all measured ventilations focusses on both the intra-operator and inter-operator level.

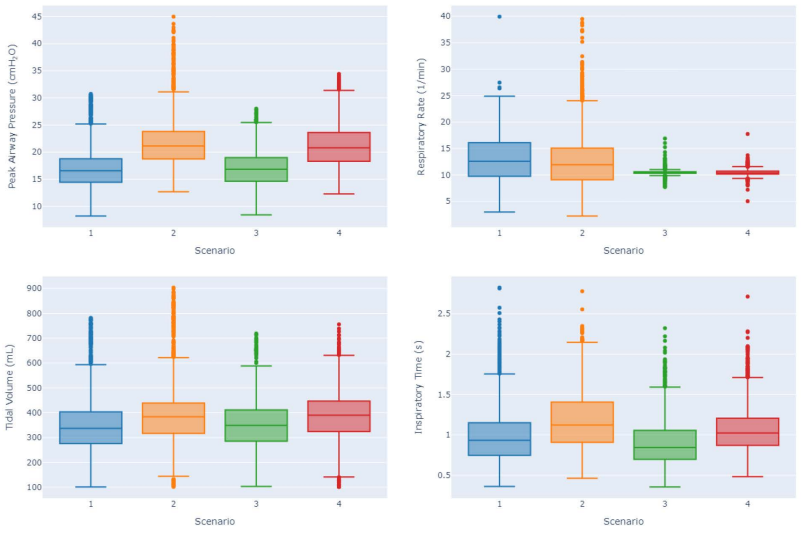
Results

The study population (n=59) had varying levels of experience where 22% had less than one year of experience and 36% had more than ten years. (Table 1). There was a statistically significant difference ($p<0.0001$) in all respiratory outcome parameters between scenarios 1 and 2 Fig 1.

TABLE 1: Characteristics of the studied population (n=59)

Age	34.9 ± 11.8
Gender	
Female	17 (29%)
Male	42 (71%)
Professional category	
Graduating doctor	12 (20%)
Nurse	28 (47%)
Resident	11 (19%)
Paramedic	4 (7%)
Attending physician	4 (7%)
Professional experience	
None ($n \leq 1$)	13 (22%)
Little ($1 \leq n < 5$)	10 (17%)
Medium ($5 \leq n < 10$)	15 (25%)
High ($10 \leq n$)	18 (36%)
Method	
Single-handed	50 (85%)
Double-handed	6 (10%)
Mixed	3 (5%)

Standardization resulted in a statistically significant difference in each of the respiratory outcome parameters ($p<0.0001$), except for peak airway pressure between scenarios 1 and 3. Peak airway pressure had outliers up to 45 cmH2O during scenario 2. The variation in respiratory rate was reduced with standardization in scenarios 3 and 4. The tidal volumes (VTs) had outliers ranging from 600 to 900 mL in scenarios 1 and 2.



Parameter	Scenario 1 (n=2492)	Scenario 2 (n=2352)	Scenario 3 (n=2256)	Scenario 4 (n=2284)	p-value (1-2)	p-value (1-3)	p-value (2-4)
Peak Airway Pressure (cmH_2O)	16.89±3.7	21.57±4.5	16.77±3.4	20.94±4.1	< 0.0001	0.5861	< 0.0001
Respiratory Rate (1/min)	13.23±5.9	12.71±5.2	10.55±3.9	10.46±0.5	< 0.0001	< 0.0001	< 0.0001
Tidal Volume (mL)	346.87±113.2	387.49±125.6	350.06±105.2	382.08±111.0	< 0.0001	< 0.0001	< 0.0001
Inspiratory Time (s)	0.99±0.3	1.17±0.4	0.89±0.3	1.06±0.3	< 0.0001	< 0.0001	< 0.0001

FIGURE 1
Boxplot and comparison of the ventilatory parameters for each scenario. (mean ± SD).

Discussion

Manual ventilation during respiratory arrest differs from the unique clinical situation during cardiac arrest, with a statistically significant difference in respiratory parameters. Respiratory arrest, scenario 1, can be compared to asynchronous ventilation during CPR. Standardization affected VT and respiratory rate, and given the already high fraction of one-handed ventilation, this effect is attributed to the metronome. Performance analysis

of ventilatory parameters in light of current guidelines is the next step in the research. Although this is a single-center study, it contributes to further understanding of manual ventilation in respiratory arrest and during synchronous ventilation in CPR, and also offers opportunities for teaching and training. The margin of error for hyperventilation and barotrauma remains small, even without the stress factors characteristic during CPR.

References

(1) Marijon E, Narayanan K, Smith K, Barra S, Basso C, Blom MT, et al. Commission to reduce the global burden of sudden cardiac death: a call for multidisciplinary action. The Lancet. 2023;402(10405):883-936.

(2) Malinverni S, Wilmin S, de Longueville D, Sarnelli M, Vermeulen G, Kaabour M, et al. A retrospective comparison of mechanical cardio-pulmonary ventilation and manual bag valve ventilation in non-traumatic out-of-hospital cardiac arrests: A study from the Belgian cardiac arrest registry. Resuscitation. 2024:110203.

(3) Khoury A, De Luca A, Sall FS, Pazart L, Capellier G. Ventilation feedback device for manual ventilation in simulated respiratory arrest: a crossover manikin study. Scand J Trauma Resusc Emerg Med. 2019;27(1):93.

"An intermediate analysis of emergency department presentations related to alleged spiking"

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Citation
Choi, K.C., Apers, J., Verougstraete, N., Paepe, P.D., Lyphout, C. "An intermediate analysis of emergency department presentations related to alleged spiking".

Introduction

Spiking means unintentionally receiving a psychoactive substance. Drink spiking is the intentional addition of drugs or alcohol into a drink without the consent of the person. Spiking is a growing concern worldwide. This study aims to investigate the characteristics and outcomes of patients presenting to the four emergency departments in the same city (ED) with alleged spiking.

Methods/Setting

A prospective analysis was conducted on ED presentations over an 10-month period. Patients were included if they reported a suspicion of piking within 5 days of event. Investigations involved a patient and healthcare provider questionnaire, and the analysis of urine and blood samples for drugs.

Results

An intermediate analysis indicates that a significant number of ED presentations were related to alleged spiking: of 36 patients, 29 were women and 7 were men. Of these 36 patients, 28 reported that they never use drugs. Eight patients had a history of sexual abuse. The alleged methods of spiking were: Drink spiking (21, 67.7%), needle spiking (2, 6.5%), unknown (8, 25.8%). Five (13.8%) patients tested positive for benzodiazepines or Z-drugs, none of which reported them as regular medications, and only 3/5 were found on immune-assay screening. Unexplained positive findings for cannabis (5), psychoactive medication (3), cocaine (2) and amfetamines (1) were noted (see table 1). Half of the patients tested positive on alcohol, with alcohol concentrations between 0,24 and 3,08 mg/L. However, we did not find 'classic' expected spiking agents like flunitrazepam (Rohypnol®) or GHB; albeit that the latter could have been missed in part of the cases due to very short detection times.

The most common symptoms were drowsiness (19, 54.3%), dizziness (14, 40.0%), nausea/vomiting (13, 37.1%), confusion (13, 37.1%), partial amnesia (11, 31.4%), and loss of consciousness (8, 22.9%).

TABLE 1: Detection of psychoactive substances in patients with alleged spiking

Agent type	Detected by IA	Detected by LC-GCMS	Reported self-administration (recreational or regular medication)	Unexplained exogenous substance
Benzodiazepines	3	6	2	4
Opioids	0	0	0	0
Amfetamine	1	1	0	1
Cocaïne	2	2	0	2
Psychoactive medication	7	7	4	3
Cannabis	7	7	2	5

Discussion

These findings highlight the relevance of increased awareness for alleged spiking in the ED setting. Systematic and standardized toxicological screening, implicating also testing with LC-GCMS, is required to understand the true prevalence of spiking and to develop effective prevention and management strategies.

Survivor outcomes following out-of-hospital cardiac arrest: Insights from the B-CAR registry

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Citation

de Longueville, D., Malinverni, S., Mols, P, Survivor outcomes following out-of-hospital cardiac arrest: Insights from the B-CAR registry.

Objective
To analyze the characteristics and outcomes of out-of-hospital cardiac arrests (OHCA) recorded in the B-CAR registry from January 1, 2017, to December 31, 2023, with a focus on survival rates, neurological status, and the impact of extracorporeal cardiopulmonary resuscitation (ECPR).

Methods
A retrospective analysis of 6418 OHCA cases was conducted, including demographic data, resuscitation efforts, hospital outcomes, and neurological status assessed using the modified Rankin Score (mRS). Survival rates and neurological outcomes were compared across age groups and gender. Additionally, the utilization and outcomes of ECPR were evaluated.

Results
Among OHCA cases, 729 individuals survived to hospital discharge, predominantly male, with a higher incidence and survival rate among males. OHCA of medical origin was more prevalent than traumatic, with better survival in the medical group. Neurological assessment revealed varying degrees of impairment, with age inversely associated with survival. The 30-40 years category exhibited the greatest post-arrest deterioration in mRS score. Notably, survivors up to 60 years maintained relatively low pre-arrest mRS scores, with a majority experiencing increased mRS scores at discharge. ECPR was performed in 22 cases, with varied timing relative to return of spontaneous circulation (ROSC), resulting in an overall survival rate of 14.0%.

Conclusion
The B-CAR registry provides valuable insights into OHCA characteristics and outcomes, highlighting the importance of gender, age, and etiology in survival rates and neurological outcomes. Additionally, ECPR demonstrates potential as a rescue therapy in select cases of OHCA. Further research is warranted to optimize patient selection and timing of interventions to improve OHCA outcomes.

Percutaneous endovascular embolectomy in acute pulmonary embolism: A case report

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Citation

Pieter, D., Evi, S., Bart, L., Andries, V.H., Jesse, M. Percutaneous endovascular embolectomy in acute pulmonary embolism: A case report.

Case Report

A 64-year-old patient was treated pre-hospital because of severe dyspnea since one week. The patient has a history of asthma. She presented with low saturation of 92% at chamber air, oxygen was given and saturation climbed to 99%, she had a normal pulse of 90/min combined with a rather low blood pressure of 80/40mmHg. She was awake and responsive.

She arrested a first time at the scene, PEA (Pulseless Electrical Activity). ROSC (Return Of Spontaneous Circulation) was seen after 2 minutes of CPR (Cardiopulmonary Resuscitation) without any medication given. She collapsed a second and third time in the ambulance, each time PEA. She was intubated and transported to the hospital under mechanical compressions using a mechanical chest compression device (LUCAS®).

Arriving at the hospital, initial TEE showed a severely dilated right ventricle. This clinical presentation, the immediate availability and resources to install an ECMO and a patients status that is not compatible with life made the ED physicians decide to install VA-ECMO. ECPR (Extracorporeal Cardiopulmonary Resuscitation) was started at the emergency department using the right arteria femoralis and the left vena femoralis.

CT thorax angiography showed bilateral central thrombi. Embolectomy was performed by the interventional radiologist with a satisfying result, several thrombi where extracted from the right pulmonary artery and truncus pulmonalis (Figure 1). TEE post procedure showed lowering of arterial pulmonary pressure from 55/25mmHg (mean pressure of 37mmHg) to 49/15mmHg (mean pressure of 29mmHg). After the procedure the patient was administered at the ICU (Intensive Care Unit). At day 2 VA-ECMO was successfully removed and at day 31 the patient was extubated (decannulation

FIGURE 1
The extracted thrombi.

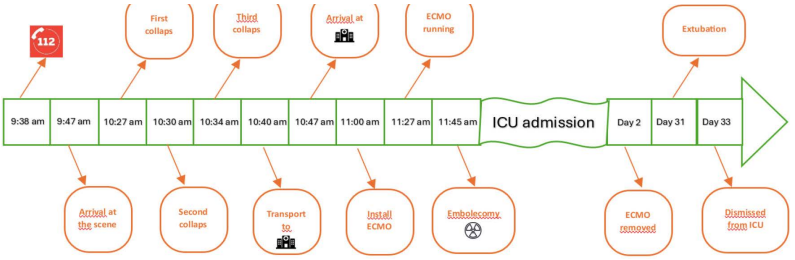

FIGURE 2
Timeline.

took place after tracheostomy was placed at day 22). There was a prolonged time to extubate because of recurrent respiratory infections and ICU acquired weakness. In the end the patient was dismissed from the ICU at day 33 Fig 2.

Discussion

Acute pulmonary embolism (PE) is the most serious clinical presentation of venous thromboembolism which can cause obstructive shock and hemodynamic instability. Right ventricular overload due to an acute pressure overload takes place and is considered the primary cause of death in severe PE. There are several therapeutic options to treat an acute PE such as thrombolysis, percutaneous embolectomy and surgical embolectomy.

According to the ESC guidelines (European Society of Cardiology), systemic hypotension or shock (severe acute PE) is an accepted indication for thrombolysis and surgical or endovascular thrombectomy can be an option in selected cases.

Primary reperfusion using catheter directed therapy (CDT) is currently not the first line therapy for patients with high risk acute PE due to the lack of high quality evidence from randomized controlled trials (RCT). As CDT is more and more available we should be aware of this therapeutic possibility

and consider this therapy in high risk PE. Especially in patients with high risk bleeding with systemic thrombolysis, for example a patient on VA-ECMO.

Reference

Stavros V K, et al.,2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS). Eur Heart J. 2020 Jan 21;41(4):543-603.

Automated decision support for assistance in ambulances

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Citation
De Jaegere, A., Ordies, S., Boxstael, S.V., Mesotten, D., Asbroeck, P.J.V. Automated decision support for assistance in ambulances.

Introduction

Belgian emergency medical services, coordinated through the 112 emergency centre, include ambulances, MUG (Mobile Urgency Group), and PIT (Paramedical Intervention Team). Ambulances can request MUG assistance, relying on their training and standing orders. In 2021, 610.952 ambulance interventions were conducted, of which 140.002 were supported by MUG. MUG assistance increased by 28% from 2012 to 2019. [1]. Prehospital physician presence may affect patient survival, though evidence is limited. [2]. Accurately assessing the need for a physician confers survival advantages but raises healthcare costs and limits hospital resources. Increasing MUG interventions raises concerns about non-standardized indications leading to MUG under- or over-utilization. Our study aims to standardize these indications to aid paramedics in decision-making.

Methods

For this study, we utilized a decision-making model derived from prehospital-to-hospital communication efficiency. [3]. This model followed the ABCDE method and was based on the REM-triage score. [4]. AMBUREG intervention

reports were retrospectively assessed in 2023 from March 1 till March 21. Only interventions with all necessary parameters for computation of the model were included. These included vital parameters for calculating REM-score, VAS pain score, temperature and glycemia level. MUG assistance requests, specified in the AMBUREG reports, were used as comparison to the decision-making model, using the Fisher exact test. Secondary outcomes, including hospitalization, ICU admission, mortality, and length of hospitalization were collected, along with ambulance call reasons. Odds ratios were calculated for categorical variables, and t-test were used for continuous variables.

Results

During a three-week span, 681 interventions occurred, of which 124 reports met inclusion criteria. The predominant reason for exclusion was low completion rates of the reports, with 81.8% missing important data. [Table 1]. This decreased to 64.8% when MUG assistance was requested, suggesting enhanced data collection practices before seeking additional resources. There was a discrepancy in reports, with fewer parameters seemingly collected for trauma compared to illness. The decision-making model significantly requested MUG assistance more frequently compared to actual

TABLE 1: Missing data

	Complete	Incomplete
Total	124/681(18.2%)	557/681(81.8%)
PIT intervention	37/105 (35.2%)	68/105 (64.8%)
MUG intervention		
Immediate	16/90 (17.8%)	74/90 (82.2%)
Requested	7/19 (36.8%)	12/19 (63.2%)
Reason		
Ilness	90/470 (19.1%)	380/470 (80.9%)
Trauma	16/172 (9.3%)	156/172 (90.7%)
Psychiatric	1/13 (7.7%)	12/13 (92.3%)
Intoxication	1/16 (6.3%)	15/16 (93.7%)

PIT = paramedic intervention team. MUG = mobile urgency group.

TABLE 2: Analysis of primary and secondary outcomes

	Model	Reality	p value
Primary outcome			
MUG assitance	32/124(26%)	11/124(9%)	< 0.001
Corrected for positive FAST test	23/124(19%)		< 0.001
Secondary outcomes			
Hospitalisation (OR)	2.05[95%CI 0.85-4.92]	3.23[95%CI 0.69-16.09]	0.153
IC admission (OR)	1.71[95%CI 0.53-5.54]	0.77[95%CI 0.09-6.51]	0.751
in-hospital mortality (OR)	2.42[95%CI 0.77-7.62]	3.48[95%CI 0.80-15.06]	0.196
LOS (mean)	8.33	8.33	0.996

MUG=mobile urgency group. IC = intensive care. OR = odds ratio. CI = confidence interval.
LOS = length of stay (in days). FAST = Face, arms, speech and Time (symptoms of a stroke)

requested MUG assistance ($p < 0.01$). [Table 2] This trend persisted even when adjusting for a positive FAST test as a determinant for MUG assistance. However, this model's indication for MUG assistance does not match reality, since it would only delay urgent patient care.[5] Examining secondary outcomes, the likelihood of hospitalization, ICU admission, and mortality seemed to increase with MUG assistance, although not significantly. [Table 2]. Additionally, no significant difference in hospitalization duration was found.

Discussion

Our study underscores a notable lack of report completion, hindering research and subsequent improvements in healthcare. While the decision-making model significantly deviates from current practice, it doesn't impact key outcome measures like mortality or hospitalization duration. Our dataset might be underpowered to demonstrate a significant difference as it involves very small groups. Nonetheless, a structured program can offer benefits as an on-site memory aid for paramedics and for enhancing communication. Further development of a standardized model in the future appears warranted; however, adjustments need to be made to the current model and tested in a larger dataset.

References

[1] Gezond België. Blikvanger gezondheidszorg: Naar een geïntegreerde eerstelijnszorg. [Internet]. 2020 [Geraadpleegd op 11 april 2024]; Beschikbaar via: https://www.gezondbelgie.be/images/Blikvanger_Gezondheidszorg_DH_NL_v8.pdf

[2] Bøtker MT, Bakke SA, Christensen EF. A systematic review of controlled studies: do physicians increase survival with prehospital treatment?. Scand J Trauma Resusc Emerg Med. 2009;17:12.

[3] Thielemans H. Time is tissue: efficiëntie van communicatie tussen ziekenhuizen en prehospitale zorgverleners bij spoedgevallen [Bachelorproef]. Thomas More; 2022. Beschikbaar via: https://scriptiebank.be/scriptie/2022/time-tissue

[4] Olsson T, Terent A, Lind L. Rapid Emergency Medicine score: a new prognostic tool for in-hospital mortality in nonsurgical emergency department patients. J Intern Med. 2004;255(5):579-587.

[5] Powers WJ, Rabinstein AA, Ackerson T, et al. Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association [published correction appears in Stroke. 2019 Dec;50(12):e440-e441]. Stroke. 2019;50(12):e344-e418.

Predicting for better healing: Evaluating hospitalization likelihood based on stakeholder intuition and patient perspectives in the emergency department

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Citation
Duquenne, T., Buddeker, C., Anh, D.N., Paquay, M., Ghuysen, A. Predicting for better healing: Evaluating hospitalization likelihood based on stakeholder intuition and patient perspectives in the emergency department.

Introduction

Overcrowding in Emergency Departments (ED) has been a growing phenomenon worldwide for the past twenty years. Recent studies have attempted to develop hospitalization prediction algorithms to accelerate throughput (1,2). The aim of this study was to investigate the predictability of patients' final status based on the intuition of the various stakeholders along with the patients' own perspectives.

Material and Methods

Using a prospective approach, we questioned participants about the likelihood of hospitalization of 157 patients at different times during their treatment in the ED. Each opinion collected was linked to the respondent's degree of confidence, reasoning and background. The patient's final status was then evaluated based on these factors. Cohen's Kappa and Fisher's exact tests were used to identify the most reliable predictor, determine the level of confidence in the predictions, and pinpoint the criteria that best predicted the final status.

Results

Based on Cohen's Kappa test, evaluations from the patients and physicians had a moderate agreement with the final status. Within the medical backgrounds, senior Emergency Physicians (EP) had the greatest agreement with the final status (K= 0.566). Regarding prediction, the patients' own perspectives had the best positive predictive value with a sensitivity (Se) of 1.00 (0.29-1.00) and a specificity (Sp) of 0.92 (0.81-0.98). The findings suggest that both triage nurses and patients tend to express greater confidence in the stated final status ($p< 0.05$). It also demonstrated a significant association ($p< 0.05$) between participants' own justifications and their prediction of hospitalization. EPs tended to explain patients' hospitalization based on results from additional tests. However, it is the specialists' opinion that best justified hospitalization. Furthermore, it appears that the "anamnestic elements" are the most significant factors explaining patients' discharge. However, the results of additional tests had no significant relationship with the patient's final status.

Discussion

Patients best predicted their final status, a result that we could not compare with the current literature given the lack of consideration of the patient's own perspectives in existing predictive models. However, these findings should be interpreted cautiously due to some limitations including a high rate of missing data (exclusion of 806 questionnaires, the study being longitudinal, required at minimum information from T1, T2, and the patient's outcome.

The longitudinal nature and the involvement of multiple teams led to poor questionnaire completion), a moderate level of agreement (k = 0.546) and a small sample size (n = 157). To further validate these findings, it is advisable to enlarge the sample size and integrate patients' severity index. Looking at the given decision-making process, the systematic use of additional tests is challenged in view of the lack of relationship with patients' final status and the need to speed up throughput. Nevertheless, by confining EP's role to the decision of hospitalization or discharge, we may ignore their important contributions to advancing medical care and treating pathologies.

Conclusion

A predictive model does not have to be particularly complex to predict a patient's final status. The prospective approach is interesting to consider the intuitions of the various stakeholders and of the patients' own perspectives themselves, thereby promoting their empowerment, fostering greater reflexivity and ensuring a more accurate analysis.

References

(1) Lee JT, Hsieh CC, Lin CH, Lin YJ, Kao CY. Prediction of hospitalization using artificial intelligence for urgent patients in the emergency department. Sci Rep. 2021 Dec;11(1):19472.

(2) Parker CA, Liu N, Wu SX, Shen Y, Lam SSW, Ong MEH. Predicting hospital admission at the emergency department triage: A novel prediction model. The American Journal of Emergency Medicine. 2019 Aug;37(8):1498–504.

Annexes

Annexe 1

Questionnaire pour le patient lorsque celui-ci arrive aux urgences.

POUR LE PATIENT A L'ACCUEIL ! 1. Quelle heure est-il ?

a. Réponse :

2. Selon-vous, allez-vous rester hospitalisé à l'hôpital (cochez la bonne réponse) ?

a. Oui

b. Non

3. Quel-est votre niveau de certitude en rapport avec la Q°2 (cochez la bonne réponse) :

0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10

(NB : 0 = Pas du tout certain / 10 = Absolument certain)

4. Quels sont les éléments qui influencent cette décision ? Soyez clair et précis. .....
....
....
....
....
.....

Pourquoi le patient n'a-t-il pas complété son questionnaire ? (Infirmier référent) .....
....
.....

Annexe 2: Questionnaire pour le personnel au premier contact avec le patient.

AU PREMIER CONTACT LORS DE LA PRISE EN CHARGE (INFIRMIER) !

1. Le patient Collez une étiquette du patient ici.

2. Quelle heure est-il ?

a. Réponse :

3. Quelle-est votre fonction au sein du service des urgences (cochez la bonne réponse) ?

a. Infirmier

b. Médecin (urgentiste – superviseur)

c. Assistant SMU Junior (1ère à 3ème année)

d. Assistant SMU Sénior (3ère à 6ème année)

e. Assistant autre Junior (1ère à 3ème année)

f. Assistant autre Sénior (3ère à 6ème année)

4. Selon vous, ce patient va-t-il rester hospitalisé (cochez la bonne réponse) ?

a. Oui

b. Non

5. Quel-est votre niveau de certitude en rapport avec la Q°4 (cochez la bonne réponse) ?

0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10 (NB : 0 = Pas du tout certain / 10 = Absolument certain)

6. Quels sont les éléments qui influencent cette décision ? Soyez clair et précis. .....
....
....
....
....
.....

A case of Budd-Chiari syndrome

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Citation
Amina, F., Lisa, V.M. A case of Budd-Chiari syndrome.

Introduction

Budd-Chiari syndrome is a rare condition characterized by the obstruction of the hepatic veins; primary because of a thrombus or secondary by external compression for example as the result of an abscess or tumor.

Case Description

A 44-year-old patient with no history presented at the emergency department with abdominal pain since 3 days. The lab test shows a slightly increased transaminase and ultrasound and CT abdomen showed large amounts of ascites. The patient was admitted with rapid deterioration with lactic acidosis and hemodynamic instability with extensive liver failure. Additional imaging (ultrasound and CT) suspected Budd-Chiari syndrome due to filling defects in the hepatic veins, after which heparin was started. The diagnosis was confirmed by the finding of a thrombus during angiography after which an angioplasty was performed without clinical improvement. A liver transplant was performed after which clinical recovery was acquired. At admission a polycythemia and thrombocytosis were noted. DNA testing showed a JAK2+ gene mutation. A bone marrow puncture confirmed the diagnosis of the JAK2 myeloproliferative neoplasia, type polycythemia vera. Treatment with aspirin and hydroxyurea were initiated.

Discussion

Primary Budd-Chiari syndrome is caused by a thrombus in the hepatic veins and is often accompanied by an underlying cause such as malignancy, hereditary coagulopathy, ... The clinical presentation often consists of the triad of abdominal pain, ascites and hepatomegaly and can have an acute or subacute/chronic presentation. The diagnosis can be suspected when additional examination (such as ultrasound, CT or MR abdomen) is unable to visualize the hepatic veins. Hepatic venography can confirm the diagnosis but is invasive. The aim of treatment is to prevent further growth of the thrombus, induce restoration of the hepatic flow, decompress the hepatic congestion and to prevent the complications. Thrombolysis or angiographic intervention with or without surgical decompression can be considered, while transplantation remains a last resort. Treatment for any underlying cause of trigger should be started as soon as possible.

Prehospital Point of Care Ultrasound in Helicopter Emergency Medical Services: A five-year experience retrospective study in Belgium

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Citation

Gontier, R., Betz, R., Gilbert, A., Moens, D., Marissiaux, L., Paquay, M., Pirotte, O., Ghuysen, A., Stipulante, S. Prehospital Point of Care Ultrasound in Helicopter Emergency Medical Services: A five-year experience retrospective study in Belgium.

Introduction

Point-of-care ultrasonography (POCUS) involves the immediate use of ultrasound imaging by clinicians at the bedside to aid in clinical decision-making and improve diagnostic capabilities. For Helicopter Emergency Medical Services (HEMS), the application of Clinical ultrasound (CUS) has the potential to enhance prehospital care quality and facilitate decision-making for patient destination. This study aims to explore the operational profile of CUS within a HEMS setting, evaluating its link with diagnostic accuracy, therapeutic interventions, and decisions regarding hospital destinations at the Helicopter Medical Center of Bra-sur-Lienne (CMH), Belgium.

Methods

A retrospective analysis was conducted over a five-year period from January 2018 to December 2022. Data included mission and patient characteristics, CUS examination, choice of therapeutic options and hospital destination. These were obtained through a retrospective analysis of the CMH center's electronic database, the 112 dispatching center databases and the medical datafile of the Liege University Hospital Center. All eligible files were retrospectively assessed by one investigator who assigned an agreement score between the CUS results and the hospital imaging findings. The agreement score was categorized into three possibilities: full agreement, partial agreement, and no agreement.

Results

Among the 6,126 interventions assessed, 1,810 ultrasound exams were performed (29.55%). In 30.88% of these instances, CUS led to a change in therapeutic actions. Hospital destination decisions were affected in 9% of the cases. There was an 80.39% agreement rate between prehospital CUS diagnostics and hospital imaging, suggesting the utility of CUS in enhancing diagnostic accuracy in prehospital settings. The implementation of CUS did not significantly extend on-scene intervention times, with most examinations completed within five minutes.

Discussion

The application of prehospital CUS in HEMS shows a potential to enhance medical decision-making by improving diagnostic accuracy. The agreement between prehospital CUS findings and hospital findings reaffirms the relevance of these examinations and their ability to enhance clinical diagnostic precision, which could significantly benefit patients. CUS should enable HEMS physicians to alert the hospital team earlier, thereby providing the most suitable care. However, the variability in its application underscores the need for standardized guidelines to optimize its usage. The retrospective, monocentric design and focus on on-site ultrasound evaluations of our study highlight the necessity for broader, prospective research to further substantiate the benefits of CUS within emergency medical services.

Smiling is infectious (not the Milligan's poem): The 'hidden' infective endocarditis in the emergency department

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Citation

Higny, J., Ntwali, F., Forêt, F., Benoît, M. Smiling is infectious (not the Milligan's poem): The 'hidden' infective endocarditis in the emergency department.

Introduction

Early recognition and management of septic shock in the emergency department (ED) remain challenging. It has been reported that to 5-10% of critically ill patients with sepsis present an unknown origin [1]. Nowadays, critical care echocardiography (CCE) has become the first-line tool to assess patients in shock state. Point-of-Care Ultrasound (POCUS) is performed by a growing number of emergency physicians [2].

Case Presentation

A 74-year-old man was admitted to our ED for confusion, hypotension and fever. Physical examination revealed an arthritis of the right wrist. Blood analysis demonstrated an inflammatory syndrome (CRP: 295 mg/L), neutrophilic leukocytosis (12490/µL), acute kidney failure (creatinine: 2.06 mg/dL), impaired coagulation (TP: 42%) and lactic acidosis (pH:

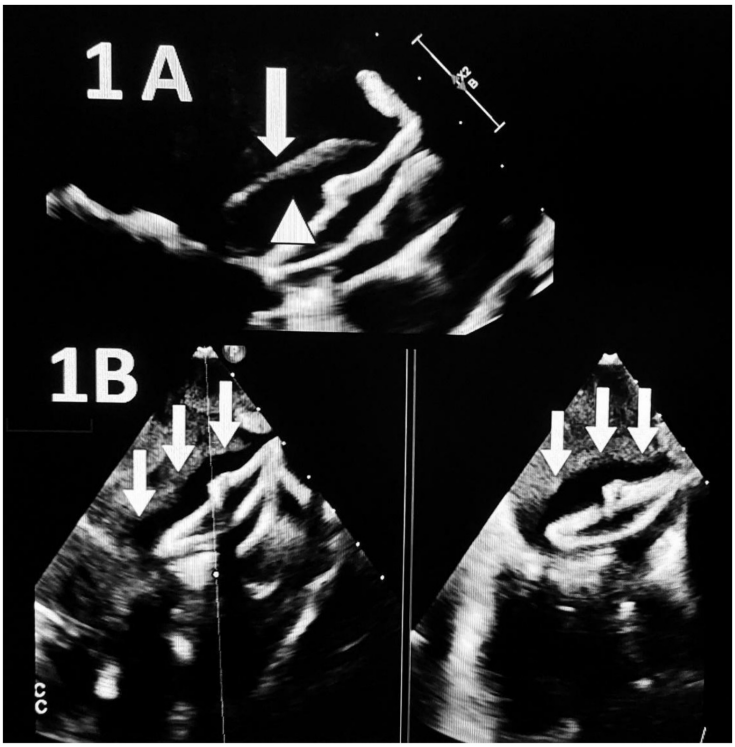

FIGURE 1

A. TEE images of the LAA occluder illustrating an anechoic mass (arrowhead) consistent with abscess circumscribed with a pyogenic membrane (arrow).

B. Post- contrast-enhanced TEE evaluation of the LAA occluder with xPlane imaging demonstrating the circumscribed anechoic collection consistent with abscess (arrows).

7.31, lactate: 2.6 mmol/L). Lifesaving support included fluid resuscitation, blood culture, vasopressor, antibiotic therapy and mechanical ventilation. The medical history included atrial fibrillation and interventional left atrial appendage (LAA) closure. Cardiac POCUS was performed regarding the recommendations of The European Association of Cardiovascular Imaging to exclude emergency cardiac diagnostics [3]. The examination was not conclusive and demonstrated a preserved cardiac function without evidence of pericardial effusion, right ventricular failure or significant valvular disease. Transesophageal echocardiography (TEE) was performed for its incremental value in terms of diagnosis and monitoring. TEE was more conclusive and revealed an anechoic structure (1.7x1.0 cm) located on the LAA occluder (Figure 1A). Two-dimensional TEE examination with xPlane imaging confirmed an anechoic mass located on the device. Strikingly, contrast-enhanced imaging confirmed the anechoic circumscribed structure which raised the suspicion of abscess (Figure 1B). Pre- and post- contrast video loops clearly illustrated the previously described abnormality after complete opacification of the left atrium (Video clip). In this context, an infective endocarditis of the LAA closure device complicated with multiple organ failure was diagnosed. To our knowledge, only six cases of this condition have been reported in the literature [4].

Discussion

POCUS has become fundamental in diagnosis and management of shock states. TEE has gained importance, particularly in critically ill patients under mechanical ventilation. Our experience demonstrated that TEE was key in diagnosis of this rarely reported cause of septic shock. Regarding cardiac ultrasound, we are convinced that training experience and interpretation in appropriate contexts are fundamental for the safety of the patients. Indeed, we illustrated that bedside cardiac ultrasonography was not appropriate to diagnose this uncommon presentation of endocarditis. Also, this case report demonstrates that a focus on oral health and mouth examination play a crucial role in patients admitted in the ED with sepsis of unknown origin (Figure 2).

FIGURE 2
Patient's mouth examination revealing a very poor oral hygiene consistent with entrance door of microorganisms responsible for LAA device-related endocarditis.
Video clip. Real-time pre- and post- contrast-enhanced TEE evaluation of the LAA occluder. The previously detected anechoic mass has been circumscribed after complete opacification of the left atrium.

Conclusion

Septic shock of unknown origin represents a diagnostic challenge for ED physicians. In this clinical case, we described a unique case of 'hidden' infective endocarditis. This is a short reminder that transthoracic

echocardiography can be misleading to diagnose device-associated endocarditis. Importantly, we are convinced that the incidence of device-related infection is expected to rise because of the increase in percutaneous implantation of cardiac devices. Finally, this case reminds us that a rigorous clinical examination (i.e. cutaneous and mouth inspection) remains fundamental in patients with sepsis and cardiac implantable devices.

References

[1] Ling, L., Mui, O.O.Y., Laupland, K.B. et al. Scoping review on diagnostic criteria and investigative approach in sepsis of unknown origin in critically ill patients. j intensive care **10**, 44 (2022). https://doi.org/10.1186/s40560-022-00633-4.

[2] Cecconi M, De Backer D, Antonelli M, Beale R, Bakker J, Hofer C, Jaeschke R, Mebazaa A, Pinsky MR, Teboul JL, Vincent JL, Rhodes A. Consensus on circulatory shock and hemodynamic monitoring. Task force of the European Society of Intensive Care Medicine. Intensive Care Med. 2014 Dec;40(12):1795-815. doi: 10.1007/s00134-014-3525-z. Epub 2014 Nov 13. PMID: 25392034; PMCID: PMC4239778.

[3] Neskovic AN, Edvardsen T, Galderisi M, Garbi M, Gullace G, Jurcut R, Dalen H, Hagendorff A, Lancellotti P; European Association of Cardiovascular Imaging Document Reviewers:; Popescu BA, Sicari R, Stefanidis A. Focus cardiac ultrasound: the European Association of Cardiovascular Imaging viewpoint. Eur Heart J Cardiovasc Imaging. 2014 Sep;15(9):956-60. doi: 10.1093/ehjci/jeu081. Epub 2014 May 27. PMID: 24866902.

[4] Al-Terki H, Mügge A, Gotzmann M. Infective endocarditis of a left atrial appendage closure device: a case report and literature review. Eur Heart J Case Rep. 2022 Oct 31;6(11):ytac434. doi: 10.1093/ehjcr/ytac434. PMID: 36415684; PMCID: PMC9675590.

Drugs associated with hospitalisation after Tomorrowland festival

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Citation
Jans, M., Vos, K.D. Drugs associated with hospitalisation after Tomorrowland festival.

Introduction

Tomorrowland is a yearly electronical music and dance festival happening in Boom, Belgium with over 100.000 attendees each weekend. The burden on the emergency department is high, with mostly drug related cases. We did interviews and toxicological research on each patient who was admitted in the University hospital in 2022.

Methods

Each patient was contacted during their hospital stay and a questionnaire was filled out. We asked about drug use at the festival, how the drugs were obtained and what they thought was the reason for hospitalisation. This to get a better insight in the morbidity of drug use and to set up adequate prevention plans on site. Consequently we looked at the toxicology reports of the urinary samples obtained from each patient.

Results

27 patients were interviewed after hospitalisation during 3 weekends of the festival. Everyone was tested for ethanol intoxication. 18 persons tested positive for alcohol (=66.67%), with blood alcohol levels ranging from 0.79 mg/l till 3.12 mg/l with a mean alcohol level of 1.99 mg/dl.

Seven patients admitted to their intent of taking drugs before the festival (26%), 48% denied using drugs, excluding alcohol, at the festival site.

25 patients underwent a toxicology screening of an urinary sample, this was positive in 21 patients (84%). Of those testing positive the most used drug is MDMA in 14 persons (56%), followed by methamphetamine in 44% and cocaine in 32% of the total population. Six persons tested positive for amphetamines and six patients tested positive for cannabis (24%). Five people

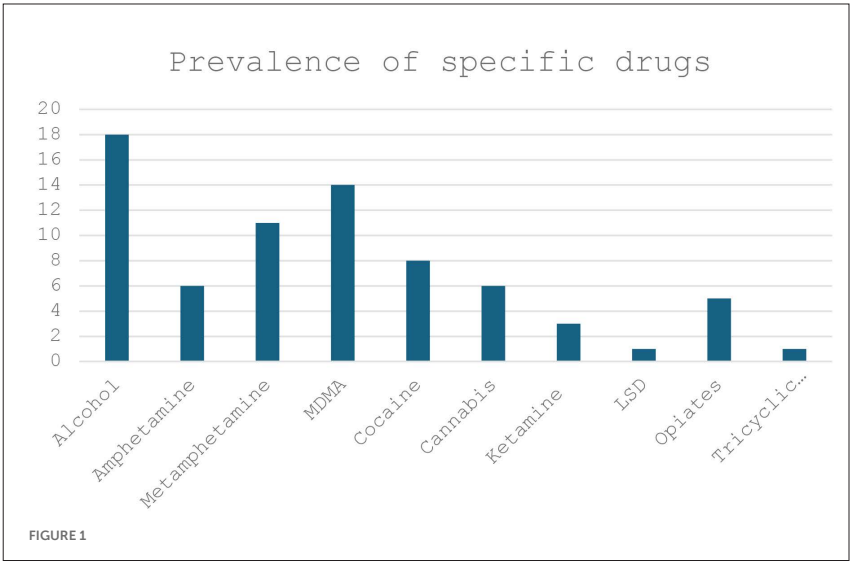

FIGURE 1

tested positive for opiates (20%), three people for ketamine (12%). There was one test positive for LSD and one test positive for tricyclic antidepressants. (fig 1).

Most people were intoxicated with more than one agent, alcohol included. Four people screened positive for a combination of 5 agents (all including methamphetamine, amphetamine and MDMA), which was the most reported in this population.

In the confirmation analysis we found two incidences of levamisole which is an antihelminhic medication mostly used in veretinary medicine to treat ascariasis. It is known as an adulterating agent in cocaine, fentanyl and heroine. (1)

Discussion

Positive benzodiazepine screening was left out since most people arriving in the hospital had already received benzodiazepines in the medical post at the festival.

The most intoxications were intoxications with multiple toxins, which can cause more harm, it is also essential to stay vigilant for unknown elements added in the drugs such as levimasole which can cause severe reactions. No special reactions were noted in this study population.

Reference

(1) Midthun KM, Nelson LS, Logan BK. Levamisole-a Toxic Adulterant in Illicit Drug Preparations: a Review. Ther Drug Monit. 2021 Apr 1;43(2):221-228. doi: 10.1097/FTD.0000000000000851. PMID: 33298746.

From seasoning to poison: An overview of salt intoxication

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Citation
Janssen, L., Haesendonck, R., Ordies, S., Vanelderen, P., Boxstael, S.V., Dijck, C.V., Asbroeck, P.J.V. From seasoning to poison: An overview of salt intoxication.

Case Presentation

A 46-year-old woman with breast cancer and depression presented at our emergency department. She attempted suicide by ingesting 250 grams of table salt, and 20 mg of lorazepam. She was found in a drowsy state, with altered consciousness and multiple episodes of emesis.

Introduction

Severe hypernatremia is a potentially life-threatening electrolyte disorder, defined by serum sodium levels exceeding 150 mEq/L. The lethal dose of salt in animal models is 3 g/kg body weight. However, doses as little as 25 grams have been associated with death in humans [1, 2]. Hypernatremia can result from various underlying causes and may lead to severe complications. Early recognition and appropriate treatment are necessary.

Etiology

Hypernatremia can be caused by iatrogenic factors, dehydration due to gastro-intestinal or renal fluid losses, central and nephrogenic diabetes insipidus, or medication-related. Rarely it occurs after intentional ingestion of salt, as we present in this case report.

Clinical Presentation

In mild cases, hypernatremia may present with extreme thirst and polyuria. More severe cases present with tachycardia, hypotension, weakness and muscle twitches. Eventually, there may be elaborate neurological symptoms such as an altered mental status, seizures or even coma. Our patient presented with drowsiness and emesis.

Diagnostic Workup

Besides the serum sodium, the volume status should be assessed. It is important to assess whether it concerns a hypovolemic, euvolemic or hypervolemic hypernatremia. Our patient suffered an euvolemic hypernatremia with an initial sodium level of 155mmol/L. This fairly low level can be explained by diminished uptake of sodium because of emesis. Vital signs were stable, urine output maintained, urine osmolality was 649 mOsm/kg, and urine sodium was 222 mmol/L. The free water deficit was

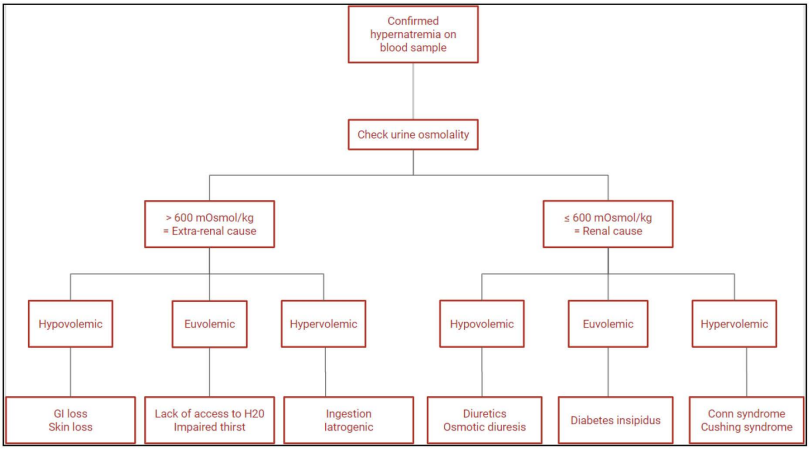

FIGURE 1
The diagnostic workup of hypernatremia.

estimated to be 3.25 L. When the cause of hypernatremia is unclear, further workup consists of testing for diabetes insipidus using a water deprivation test or desmopressin stimulation test. Imaging studies (MRI or CT-scan) and additional laboratory investigations can be used to confirm or exclude other underlying etiologies {Fig. 1}.

Management Strategies

Hypernatremia is primarily treated by rehydration using oral intake or IV hypotonic fluids such as glucose 5%. Treatment of our patient consisted of both oral and IV rehydration. She received 300 ml IV glucose 5% over a 2.5 h timespan, leading to a sodium of 146 mmol/L. Then plasmalyte-glucose 5% was started at a rate of 40 ml/h. Fifteen hours after admission the sodium had risen again to 147 mmol/L, thus another 500 ml of glucose 5% was given, leading to further normalization of sodium and correction of the free water deficit. During treatment, our patient also received 4 g of oral potassium chloride. Her neurological status improved quickly, and she was discharged from the hospital without residual injuries within less than 1 week.

Conclusion

Severe hypernatremia is a potentially life-threatening condition that requires prompt recognition, appropriate diagnostic workup, and timely intervention to prevent severe complications such as cerebral edema, central pontine myelinolysis and permanent neurological deficits [3, 4].

References

[1] Campbell NRC, Train EJ. A Systematic Review of Fatalities Related to Acute Ingestion of Salt. A Need for Warning Labels? Nutrients. 2017 Jun 23;9(7):648. doi: 10.3390/nu9070648. PMID: 28644412; PMCID: PMC5537768.

[2] Norma A. Metheny, Mary M. Krieger, Salt Toxicity: A Systematic Review and Case Reports, Journal of Emergency Nursing, Volume 46, Issue 4, 2020, Pages 428-439, ISSN 0099-1767, https://doi.org/10.1016/j.jen.2020.02.011.

[3] Chauhan K, Pattharanitima P, Patel N, Duffy A, Saha A, Chaudhary K, Debnath N, Van Vleck T, Chan L, Nadkarni GN, Coca SG. Rate of Correction of Hypernatremia and Health Outcomes in Critically Ill Patients. Clin J Am Soc Nephrol. 2019 May 7;14(5):656-663. doi: 10.2215/CJN.10640918. Epub 2019 Apr 4. PMID: 30948456; PMCID: PMC6500955.

[4] Sterns RH. Disorders of plasma sodium--causes, consequences, and correction. N Engl J Med. 2015 Jan 1;372(1):55-65. doi: 10.1056/NEJMra1404489. PMID: 25551526.

Unplanned readmission of older patients to an emergency department: A retrospective study

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Citation

Kaisergruber, J., Baelen, R., Cornette, P., Collard, A., Steenebruggen, F. Unplanned readmission of older patients to an emergency department: A retrospective study.

Introduction

The growing group of older people (OP) accounts for up to a quarter of emergency department (ED) admission (1). Compared to their younger counterparts, they are at greater risk of mortality, functional decline and unplanned hospital readmission (UR) to ED (2). UR within the month is a quality indicator for hospital performance, as these readmissions are likely to be related to the index admission (3). We therefore wanted to analyze the social, demographic, medical and functional characteristics of patients aged ≥ 75 readmitted to the ED within the month in our institution.

Methods

In this single-center retrospective study, digital medical records (DMRs) of patients aged ≥ 75 years with an UR within 31 days to the ED of Cliniques Universitaires Saint-Luc (Brussels, Belgium) over a 2-months period (January and July 2019) were included. All data were derived from their DMRs. Patients without DMR or in palliative status were excluded. We analyzed the first and second ED visits of each patient over the course of one month, while excluding any additional visits beyond these initial two. Sociodemographic, functional and comorbidity-related variables were defined and analyzed.

Results

During the study period, we observed a UR occurrence of 10.5% in our ED. After exclusions (n = 43), 124 DMR were analyzed (median age 81 years, 48% male). Table 1 summarized OP characteristics. Most patients were discharged

TABLE 1: Patients characteristics at the 1st emergency admission

	Total (n = 124)
Socio-demographic factors	
Age (years) {median (IQR)}	81 (75 ; 97)
Male/Female {n (%male)}	60/63 (48)
Living alone {n (%)}	4 (5)$^{+48}$
Living at home {n (%)}	90 (84)$^{+17}$
Living at home with informal assistance (family) {n (%)}	35 (46) $^{+48}$
Living at home or in a nursing home with formal assistance {n (%)}	37 (49) $^{+48}$
Living in a nursing home {n (%)}	17 (16)$^{+17}$
Previous hospitalization within 6 months {n (%)}	50 (40)$^{+3}$

(*Continued*)

(*Continued*)

Preadmission function {n (%)}	
Current disorientation	10 (13)$^{+48}$
Usual cognitive disorder	30 (53)$^{+67}$
ED admission for a fall	11 (14)$^{+46}$
12-months fall(s) history	21 (27)$^{+46}$
Comorbidity-related variable {median (IQR)}	
CCI	6 (3 ; 15)
Number of current medication	6 (0 ; 15)
ED discharge destination {n (%)}	
Hospitalization	9 (8)$^{+8}$
New nursing home institutionalization	2 (2)$^{+8}$
Usual place of residence	105 (90)$^{+8}$

IQR = Interquartile range ; CCI = Charlson Comorbidity Index
$^{+3}$ = 3 missing data ; $^{+8}$ = 8 missing data ; $^{+17}$ = 17 missing data ; $^{+46}$ = 46 missing data ; $^{+48}$ = 48 missing data ; $^{+67}$ = 67 missing data

after ED. The social and functional characteristics were poorly documented in the DMR, with over a third of the data missing. Reasons for consultations leading to UR were mainly related to Injuries and external causes (n = 23), urinary tract pathology (n = 21), circulatory illnesses (n = 13), respiratory illnesses (n = 11) and gastro-intestinal issues (n = 10). The discharge diagnosis established at the 1st and 2nd ED visits showed an association with a moderate level of agreement, as indicated by the Cohen's kappa, with a coefficient of 0.56 (95% CI: 0.47-0.66). UR occurred within 24 hours in 15 patients (12%) and within 72 hours in 38 patients (31%) (Fig 1).

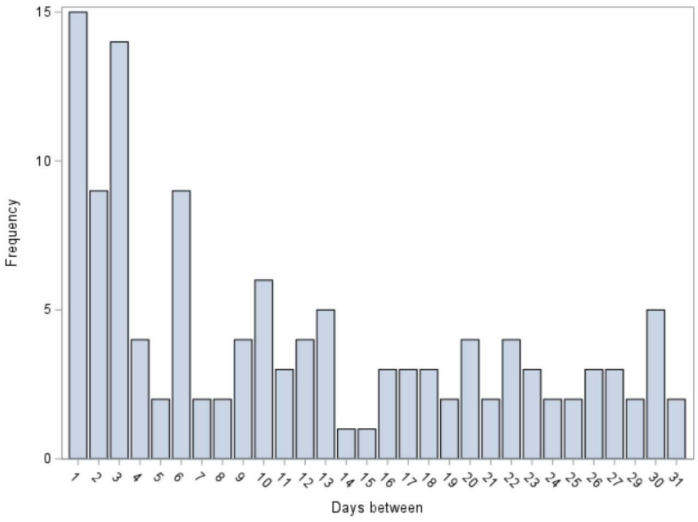

FIGURE 1
Time interval between first visit at ED and UR.

Discussion

The occurrence of URs in our ED was similar to reported in the literature (4). The majority of URs had the same discharge diagnosis as the index admission. Functional and social risk factors were insufficiently documented even if they are known to be associated with readmissions (5). These results indicate the need of a more precise comprehension of the risk factors leading to URs in order to facilitate their assessment in the ED. A better vision of the OP's state of health could lower those URs. The DMR could help identify risk factors, for example, by automatically querying their encoding. Artificial intelligence could also play a prominent role in identifying those factors in the future. Future research should investigate best practice in the management of OP in ED given their high risk of mortality and functional decline.

References

(1) Samaras N, Chevalley T, Samaras D, Gold G. Older patients in the emergency department: a review. Ann Emerg Med. 2010;56(3):261-269.

(2) Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. Ann Emerg Med. 2002;39:238-247.

(3) Fischer C, Lingsma HF, Marang -van de Mheen PJ, et al.Is the Readmission Rate a Valid Quality Indicator Fischer C, Lingsma HF, Marang-van de Mheen PJ, Kringos DS, Klazinga NS. Correction. Is the readmission rate a valid quality indicator? A review of the evidence. PLoS One. 2015 Feb 27;10(2):e0118968. doi: 10.1371/journal.pone.0118968. Erratum for: PLoS One. 2014;9(11):e112282. PMID: 25723477; PMCID: PMC4344298.

(4) Pérès K, Rainfray M, Perrié N, Emeriau JP, Chêne G, Barberger-Gateau P. Incidence, facteurs de risque et adéquation des réhospitalisations à court terme de personnes âgées [Incidence, risk factors and adequation of early readmission among the elderly]. Rev Epidemiol Sante Publique. 2002 Apr;50(2):109-19. French. PMID: 12011730.

(5) Cilla, F.; Sabione, I.; D'Amelio, P. Risk Factors for Early Hospital Readmission in Geriatric Patients: A Systematic Review. *Int. J. Environ. Res. Public Health* 2023, *20*, 1674. https://doi.org/10.3390/ijerph20031674

Case report – Contrast-induced encephalopathy (CIE)

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Citation
Alexia, K., Shari, Z., Lore, S. Case report – Contrast-induced encephalopathy (CIE).

Introduction

A 61-year-old man underwent an elective percutaneous coronary intervention of a chronic total occlusion of his mid-LAD. He received 263 milliliters of iomeprol 350 mgI/ml, atropine 0,6 milligram and heparin 7500 IE intravenously and verapamil 5 milligrams intra-arterial. During the post-procedure observation, the patient became increasingly agitated. His agitation progressed into combativeness, and he developed a fixed eye gaze to the right and a neglect of his left side. A stroke protocol was activated because of a suspicion of hemorrhagic stroke and the critical care response team aided with safe sedation to perform an urgent brain CT.

The imaging showed a unilateral but global edematous/ swollen aspect of the right cerebral hemisphere with effacement of the sulci and reduced corticomedullar differentiation. There was a marked hyperdensity and swollen aspect of the brain parenchyma (both white and grey matter), including a hyperdense aspect of multiple sulci, most compatible with contrast staining of the parenchyma and the subarachnoid space in the context of contrast-induced encephalopathy (fig 1).

FIGURE 1
The patient remained very agitated, which prompted transfer to the intensive care unit for further monitoring and escalation to intubation and ventilation.

Twelve hours later a CT angiography, which was performed to rule out any underlying vascular stenosis or carotid pathology, already showed decreasing of the edema. After twenty-four hours the patient could be extubated, and a complete neurologic resolution was seen after forty-eight hours. He received a follow up brain MRI three days after the event, which confirmed complete resolution of the edema and the patient was discharged home six days later.

Discussion

Contrast-induced encephalopathy (CIE) is a rare complication following **intravenous** or **intra-arterial iodinated contrast** administration. Reported incidence is between 0.5% - 3.5% [1] CIE has a **variable presentation**, most commonly reported are transient cortical blindness, focal neurological deficits, seizures, transient global amnesia and disturbances of consciousness. Symptoms are usually **transient** over 48-72 hours, but there have been case reports of long-term neurological deficits [2] and even death. [3]

Diagnosis can be made when there is a temporal correlation between the neurological dysfunction and administration of iodinated contrast and after excluding other complications as cerebral infarction/hemorrhage or hemodynamic disturbances. CIE has been reported following angiography of various vascular territories (head and neck, coronary, thoracic, abdominal, spinal) and following endovascular aneurysm treatment; however, it is more commonly associated with cerebral or carotid angiography. [4]

CIE's pathogenesis is not completely understood, but the integrity of the blood-brain barrier (BBB) plays a big role. It is currently thought that in cases of CIE the integrity of the BBB is compromised (either due to an inflammatory response after an ischemic stroke, intracranial hemorrhage or pre-existing hypertension, small vessel disease...). [1]

Contrast media in itself have also been reported to damage the BBB, even the newer generation iso-osmolar products [5]. The secondary extravasation of the contrast into the extracellular space then leads to vasogenic edema due to high osmolality and thus neurotoxic effect. [1]

Treatment of CIE consists of supportive management only and usually complete resolution of the symptoms can be expected.

References

(1) Mariajoseph F, Lai L, Moore J, Chandra R, et al. Pathophysiology of contrast-induced neurotoxicity: A narrative review of possible mechanisms. Eur Neurol. 2024;87 (1):26-35

(2) Leong S, Fanning N. Persistent neurological deficit from iodinated contrast encephalopathy following intracranial aneurysm coiling: a case report and review of the literature. Interv Neuroradiol. 2012;18(1):33–41

(3) Zhao W, Zhang J, Song Y, Sun L, Zheng M, Yin H, et al. Irreversible fatal contrast induced encephalopathy: a case report. BMC Neurol. 2019;19(1):46

(4) Babalova L, Ruzinak R, Ballova J, Sivak S, Kantorova E, Kurca E, Zelenak K, Nosal V. Contrast-induced encephalopathy. Bratisl Lek Listy. 2021;122(9):618-620. doi: 10.4149/BLL_2021_098. PMID: 34463105.

(5) Zhang G, Li T. The role of blood-brain barrier damage in the pathogenesis of contrastinduced encephalopathy. Arch Gen Intern Med. 018;2(2):34–40

Case report of a spontaneous Carotid Cavernous Fistula

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Citation
Aurélien, K., Yves, S., Laure, W. Case report of a spontaneous Carotid Cavernous Fistula.

Introduction

Carotid Cavernous Fistula (CCF) is a rare condition resulting from abnormal shunts between the carotid and the cavernous sinus. CCF is often initially misdiagnosed due to other pathologies mimicking symptoms and clinicals manifestations. The functional prognosis of the eye is at stake as it involves its vascular structures and cranial nerves. Thus, urgent management is needed once the diagnosis is confirmed.

Case

We report the case of a 67-year-old female patient, known for a medical history of fibromyalgia, chronic dry eyes, and restless legs syndrome, who presented in our Emergency Department (ED), since no recent or old traumatic head injury was related.

Her story began one month earlier with sudden pain, redness, and dryness of her left eye that she attributed to her chronic illness. At first, she self-medicated with painkillers in addition to her chronic medication, that

includes pramipexole and gabapentin. Because of increasing eye symptoms and bilateral temporal headache for several weeks, she was admitted to a first ED where an ophthalmologist prescribed her some eye drops. As her vision declined with the emergence of a blurred vision and a binocular diplopia for 3 days, she finally presented to our ED.

At the time of admission, the patient's vital signs were in the normal range and the clinical examination revealed a left eye proptosis, chemosis and redness with oculomotor palsy (ptosis with inward, upward, and downward gaze limitation). Both temporal arteries were pulsatile without pain or tenderness at palpation. Her right eye showed isolated redness with no other identified anomalies.

The blood analysis was normal without elevation of the inflammation markers. A head CT with an angio-sequence was then performed, showing a left cavernous enlargement and a bilateral cavernous enhancement at arterial

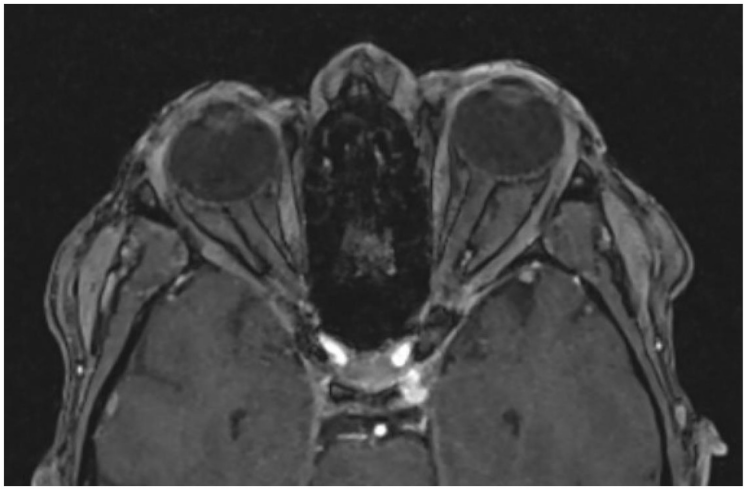

FIGURE 1
Left cavernous hyperintensity seen on TOF sequence (MRI).

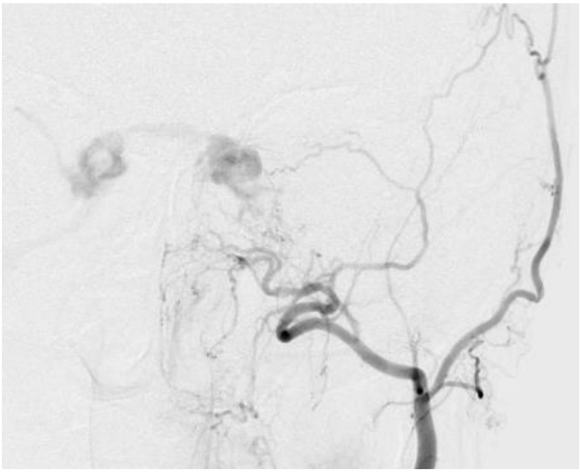

FIGURE 2
Catheter angiography revealing abnormal shunt between the left external carotid artery and the left cavernous sinus through a branch of the middle meningeal artery (bilateral cavernous enhancement seen on the picture).

phase associated with ophthalmic veins dilatation, suggesting the presence of a left CCF. The work-up was finally completed by a brain MRI, revealing similar radiological findings (fig 1).

The patient was transferred in a neurovascular reference center for a catheter cerebral angiography that confirmed the CCF (fig 2). Embolization of the fistula was successfully realized a few days later.

At two weeks of follow-up, the patient was free of headache or orbital pain and the left eye proptosis, redness and chemosis also vanished. Only an incomplete left oculomotor palsy was still reported on clinical examination.

Discussion

This case report aims to sensitize practitioners to consider the rare diagnosis of spontaneous CCF. Most cases of CCFs are encountered following

traumatic head injuries (up to 70%), with young male patients being therefore at greater risk, presenting acutely with rapidly progressing symptoms [1-5]. Conversely, spontaneous CCFs account for 30% of all cases and are mostly found in postmenopausal female patients. The onset is usually insidious with a chronic or relapsing/remitting clinical course. Conjunctival injection is the most common (and sometimes unique) presenting sign, which may lead to a delayed diagnosis and treatment. In addition, in this case, the chronic fibromyalgia may have influenced the delay of consultation and practitioners' behaviors.

References

[1] Kohli GS, Patel BC. Carotid Cavernous Fistula. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. PMID : 30571030; NBK533409

[2] American Academy of Ophtalmology: https://eyewiki.aao.org/Carotid_Cavernous_Fistula; 2024 Fev

[3] Chaudhry IA, Elkhamry SM, Al-Rashed W, Bosley TM. Carotid cavernous fistula: ophthalmological implications. Middle East Afr J Ophthalmol. 2009 Apr;16(2):57-63. doi: 10.4103/0974-9233.53862. PMID: 20142962; PMCID: PMC2813585

[4] N. Bonnin, F. Bacin, J. Gabrillargues, F. Chiambaretta, Fistule carotido-caverneuse : confrontation des aspects cliniques et neuroradiologiques pré- et post-embolisation, Journal Français d'Ophtalmologie, Volume 36, Issue 10, 2013, Pages 862-867, ISSN 0181-5512, ttps://doi.org/10.1016/j.jfo.2013.05.011.

[5] Fattahi TT, Brandt MT, Jenkins WS, Steinberg B. Traumatic carotid-cavernous fistula: pathophysiology and treatment. J Craniofac Surg. 2003 Mar;14(2):240-6. doi: 10.1097/00001665-200303000-00020. PMID: 12621297.

Acute pediatric heart failure: A case report

Author
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Citation
Julie, L., Sylvain, P.Acute pediatric heart failure: A case report.

Introduction

Causes of acute heart failure (AHF) in children differ from those in adults. In adults, ischemia and hypertension are most common causes, while in children we more often retain congenital heart defects (CHD) and cardiomyopathies. Although general treatment principles are similar, outcomes are better in children because structural heart diseases and reversible conditions are often more effectively treatable[(1)].

Case Presentation

A 12-year-old girl presents to the emergency department in acute respiratory distress, with severe tachypnea, 75% saturations and crepitations bilaterally. Hypertension of 200/120 mmHg, pulse of 140/min, temperature of 37.5°C.

Mom noticed a cough, general fatigue and thicker legs in the last four days. Lab results showed a deteriorated renal function (creatinine levels of 2.71 mg/dL), a mildly increased CRP value (38.6mg/L) and a high white blood cell count (25,400/µL). EKG showed sinustachycardia at 134/min. Chest x-ray showed substantial congestion bilaterally, acute pulmonary edema Fig 1. Covid test was positive, ct-value 28,2.

FIGURE 1
Massive pulm oedema on chest x-ray.

An urgent pediatric cardiology consult with cardiac ultrasound showed left ventricular dilatation with poor function, without structural abnormalities.

We concluded left heart failure requiring diuretics intravenously (Furosemide 30 mg), oxygen therapy and urgent transfer to a pediatric intensive care unit.

During hospitalization, it became clear this was a dilated hypertrophic cardiomyopathy due to chronic malignant hypertension in chronic renal failure, with COVID-19 infection as the suspected trigger for the acute heart failure. Several antihypertensive drugs were immediately started with favorable evolution on blood pressure and heart function. However, renal function remained poor with eventual need for peritoneal dialysis.

Discussion

Most common causes of heart failure in children depend on the child's age. In neonates and infants younger than 2 months, it usually involves structural heart diseases. In older children, congestive heart failure may be caused by obstructive left-sided disease, myocardial dysfunction, hypertension, renal failure or, rarely, arrhythmias or myocardial ischemia [(2)].

In patients with chronic kidney disease (CKD), uremic cardiomyopathy is a common complication in 17%, where pressure overload, volume overload, and the uremic state itself lead to diastolic dysfunction and left ventricular hypertrophy. Hypertension, leading to pressure overload, is the main cause of cardiac hypertrophy in CKD[(3)].

Generally, CKD is well-monitored and any form of heart failure is detected and treated early. In this case however, the CKD was not known, and the girl presented with chronical malignant arterial hypertension and left ventricular hypertrophy. Furthermore, infection is a common, though under-recognized contributor of AHF, which can cause rapid development or deterioration[(4)]. In our case, the covid infection was presumably the trigger for the acute-on-chronical heart failure.

Conclusion

Acute pediatric heart failure in neonates and young infants is mostly caused by congenital heart disorders, but if it suddenly starts at later age other causes need to be considered. In this case we presented sudden acute heart failure triggered by a Covid infection, in long-term malignant hypertension and chronic renal failure. General treatment in pediatric AHF is identical to adults and x-ray and cardiac POCUS may benefit in diagnosis and guided treatment.

References

(1) Masarone D, Valente F, Rubino M, et al. Pediatric Heart Failure: A Practical Guide to Diagnosis and Management. *Pediatrics and neonatology*. 2017; *58*(4): 303–312.

(2) Satou GM, Halnon NJ, Berger S. (2019, April 23). Pediatric Congestive Heart Failure. *Medscape*. https://emedicine.medscape.com/article/2069746-overview?form=fpf

(3) Alhaj E, Alhaj N, Rahman I, et al. Uremic cardiomyopathy: an underdiagnosed disease. *Congestive heart failure. 2013; 19*(4): E40–E45.

(4) Bezati S, Velliou M, Ventoulis I, et al. Infection as an under-recognized precipitant of acute heart failure: prognostic and therapeutic implications. *Heart failure reviews*. 2023; *28*(4): 893–904.

Brief report: An lesser known source of carboxyhemoglobline

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Citation
Pieter, L., Cathelijne, L. Brief report: An lesser known source of carboxyhemoglobline.

Introduction

An increased carboxyhemoglobin (COHb) percentage is commonly associated with carbon monoxide (CO) intoxication. However, this report sheds light on a lesser-known endogenous source of CO production.

Case

A 12-year-old patient with sickle cell disease presented at the emergency department with icterus following strenuous physical activity. Venous blood gas analysis showed an elevated COHb level, with other metabolic markers of hemolysis (hemoglobin 7,7 g/dL, haptoglobin < 0.10 g/L, Total bilirubin 7.8 mg/dL and LDH 638 U/L).

After ruling out exogenous CO exposure, the elevated COHb was concluded to be a side effect of hemolysis. The patient exhibited spontaneous improvement and was discharged the next day.

Discussion

Carboxyhemoglobin

Carbon monoxide (CO) is a gas that lacks odor, taste, and color, and is generated as a by-product during the incomplete combustion of hydrocarbons. Another exogenous source is exposure to methylene chloride, generating CO when metabolized. It forms, carboxyhemoglobin by binding to hemoglobin with significantly higher affinity than oxygen, thus reducing both oxygen-carrying capacity and utilization.

Because CO binds so avidly to hemoglobin, COHb remains in the circulation for hours and is a marker for recent exposure to exogenous CO.

The average COHb in non- smokers is less than 1%, whereas the average level in smokers is about 4%. COHb levels of 2% or greater in non-smokers and 10% or greater in smokers are considered abnormal and may lead to symptoms. (1)

Endogenous Production

There is however, also an endogenous production of CO in normal subjects as an end-product of the heme-metabolism. (2) During the catabolism of heme, Hemoxygenase (HO) enzymes break down heme molecules into free iron and equimolar amounts of biliverdin and CO (figure 1). Biliverdin is then converted into bilirubin by bilirubin reductase. Increased levels of heme due to hemolysis will therefore lead to increased levels of bilirubin and CO.

Relevance

In the absence of exposure to exogenous CO, hemolysis should therefore be considered as a differential diagnosis for patients presenting at the emergency room. (1). Intravascular hemolysis is associated with different diseases encountered in the emergency department or intensive care unit, such as hemolytic uremic syndrome, sickle cell vaso-occlusive crisis, severe Malaria, diffuse intravascular coagulopathy. At the intensive care unit, a raised COHb was found to be a reliable diagnostic marker of hemolysis. (4)

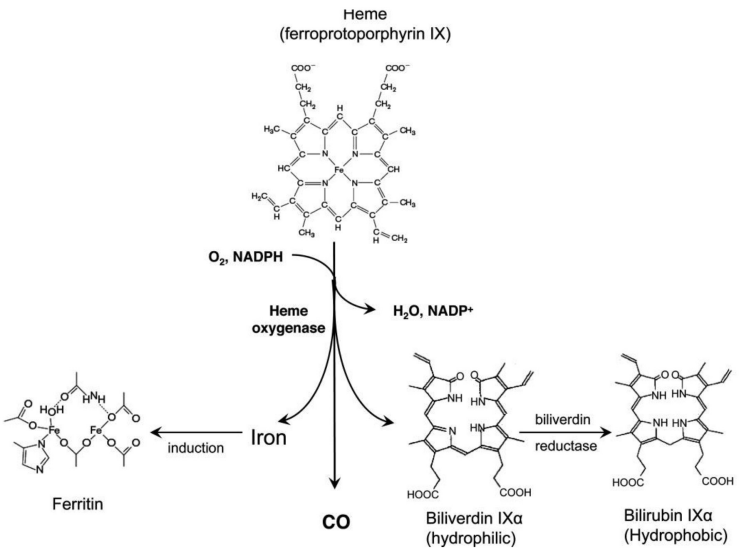

FIGURE 1
HO- catalyzed heme metabolism pathway (from Wu and Wang (3)).

The new generation of pulse CO-oximeters allow for a rapid non-invasive measurement of COHb, however, currently they do not appear to be a valid alternative for the venous blood gas for measurement of COHb. (5)

Conclusion

This case underscores the link between elevated COHb levels and underlying hemolysis, a pathophysiological process often overlooked in clinical practice. This might lead to misinterpretation as a CO-intoxication. (1, 2, 4)

The presence of an raised carboxyhemoglobin percentage can be used as a qualitative marker of increased hemolysis, provided that exogenous ambient CO exposure is primarily ruled out. (2)

References

(1) Hampson NB. Carboxyhemoglobin elevation due to hemolytic anemia. J Emerg Med. 2007;33(1):17-9.

(2) Engel RR, Rodkey FL, Krill Jr CE. Carboxyhemoglobin levels as an index of hemolysis. Pediatrics. 1971;47(4):723-30.

(3) Wu L, Wang R. Carbon monoxide: endogenous production, physiological functions, and pharmacological applications. Pharmacological reviews. 2005;57(4):585-630.

(4) Hariri G, Hodjat Panah K, Beneteau-Burnat B, Chaquin M, Mekinian A, Ait-Oufella H. Carboxyhemoglobin, a reliable diagnosis biomarker for hemolysis in intensive care unit: a retrospective study. Crit Care. 2021;25(1):7.

(5) Papin M, Latour C, Leclère B, Javaudin F. Accuracy of pulse CO-oximetry to evaluate blood carboxyhemoglobin level: a systematic review and meta-analysis of diagnostic test accuracy studies. Eur J Emerg Med. 2023.

A national survey of geriatric emergency health care: Insights into current practice

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Mahaux, A., Desender, C., Niset, A., Penaloza, A., Dupriez, F., Collard, A., Vanderhofstadt, M., Steenebruggen, F. A national survey of geriatric emergency health care: Insights into current practice.

Introduction

Emergency departments (EDs) are increasingly managing elderly patients who present unique clinical challenges (1-3). However, adapting management practices from the literature to real-world EDs can be complex (4). This study explores the current management practices for patients aged 75 years and older in Belgian EDs.

Methods

An electronic survey was sent to 105 heads of Belgian EDs. The survey addressed geriatric care and ED-related issues, collaborations, equipment, training, and protocols, including frailty screening. Responses underwent descriptive analysis and were compared according to hospital capacity and university affiliations.

Results

Overall, 58 of 105 surveys were completed. Regarding geriatric issues in the ED, time was the main constraint to providing optimal care to geriatric patients (82.8% of ED respondents) followed by lack of beds (53.4%) and insufficient staff training (39.7%). Collaboration with paramedical staff was reported in 44 centers (75.9%), especially with social workers (30/44 centers). For 40 ED heads (68.9%), telephone consultations with a geriatrician were sufficient as opposed to in-person consultations. Geriatric training was available in 24.1% of the responding EDs, while 63.8% used geriatric protocols. The majority (93.1%) had geriatric equipment such as pressure-relief mattresses (56.9%), adequate lighting (55.2%), and wall clocks (46.6%). Frailty scoring was rarely performed, with 50% never using it. Hospital size and university affiliation did not significantly influence these metrics.

Conclusion

This survey explores common geriatric issues encountered in EDs and evaluates the use of geriatric care standards. Our results highlight the need for standardized geriatric care protocols, further research, and ED policy interventions.

References

(1) SPF Santé publique, sécurité de la Chaîne alimentaire et Environnement. Feed-back national des services d'urgence - RHM 2018. https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file /spoed-2018-fr.pdf. Accessed 2023.

(2) Devriendt, De Brauwer, Vandersaenen, Heeren, Conroy, Boland, Flamaing, Sabbe and Milisen. Geriatric support in the emergency department: a national survey in Belgium. BMC Geriatr. 2017; 68. https://www.doi.org/10.1186/s12877-017-0458-8.

(3) American College of Emergency, American Geriatrics, Emergency Nurses, Society for Academic Emergency and Geriatric Emergency Department Guidelines Task. Geriatric emergency department guidelines. Ann Emerg Med. 2014; 7-25. https://www.doi.org/10.1016/j.annemergmed.2014.02.008.

(4) Aminzadeh and Dalziel. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. Ann Emerg Med. 2002; 238-47. https://www.doi.org/10.1067/mem.2002.121523.

Challenges in diagnosis of allergic reactions and anaphylaxis: A retrospective analysis at a tertiary hospital

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Citation

Elias, M., Tycho, D., Michiel, B., Griet, V. Challenges in diagnosis of allergic reactions and anaphylaxis: A retrospective analysis at a tertiary hospital.

Introduction

Allergic reactions and anaphylaxis are frequent occurrences in emergency departments (ED) and are increasingly observed. (1) Given their prevalence, severity, and potential implications, all healthcare providers should be familiar with the pathology and its management. However, multiple studies have highlighted the prevalence of misdiagnosis in this context, underscoring the significance of timely referrals for optimal patient care. (2, 3)

Methods

In this study, we conducted a retrospective monocentric observational analysis at the University Hospital Antwerp. We identified 236 patients who received a diagnosis of allergy or anaphylaxis in the emergency department who subsequently conducted a referral to the allergology or dermatology department. Patients aged 16 years or older, between January 2019 and April 2022 were enrolled. We manually compared the working diagnosis in the ED with the diagnosis upon referral to identify the common incorrect working diagnoses, and make a list of most frequently missed diagnoses.

Results

Of the 236 patients who performed a referral, there were 144 (61,0%) correct and 90 (37,4%) incorrect working diagnoses in the ED, two patients remained unclear. We distinguished seven different working diagnosis; hymenoptera allergy had 11 (92%) correct diagnoses, contrast allergy 5 (63%) correct diagnoses, drug allergy had 13 (42%) correct diagnoses, food allergy had 13 (68%) correct diagnoses, inhalation allergy had one (100%) correct diagnosis, undefined allergy had 23 (36%) correct diagnoses and urticaria or angioedema of unknown cause had 78 (77%) correct diagnoses. Of the 90 incorrect working diagnoses in the ED, we assessed the eventual diagnosis found upon referral, and categorized them as the most commonly missed diagnoses in the ED, as summarized in **(Table 1).** Our findings revealed of the false diagnoses, 34.5% had no signs of allergy and no alternative diagnosis. In 15,5% of the cases diagnosis of allergy was present but with a different trigger than initially suggested. Acute and chronic spontaneous urticaria, were found the be the cause in 20% of the false diagnoses. In 14,4% a dermatological disorder was found to be the underlying etiology. Furthermore 4,4% attributed to autoimmune diseases, 3,3% to angioedema due to angiotensin converting enzyme inhibitors (ACE-I), 3,3% to idiopathic angioedema and lastly 8,9% to various other diagnoses.

Discussion

This study reveals the complexity of allergy identification, particularly in cases lacking clear triggers, of which only 36% were correctly diagnosed cases in

TABLE 1: Missed diagnoses

Incorrect working diagnosis ED (n=90)	Corrected diagnoses after referral – 'Missed diagnoses'
	• No allergy present without alternative diagnosis **(n=31, 34,5%)**
	• Alternative allergic diagnosis **(n=14, 15,5%)** ▪ 8 Drug allergies ▪ 2 Mast cell activation syndrome ▪ 2 Inhalant allergy ▪ 1 Contrast allergy ▪ 1 Contact allergy
	• Dermatological disorders **(n=13, 14,4%)** ▪ 3 Psoriasis ▪ 2 Erythema exsudativum multiforme ▪ 1 DRESS ▪ 1 Xerosis cutis ▪ 1 Phototoxic eruption ▪ 1 Scombroid intoxication ▪ 1 Scabies ▪ 1 Dermatographism ▪ 1 Eczema ▪ 1 Dermatitis
	• Acute urticaria **(n=12, 13,3%)**
	• Chronic spontaneous urticaria **(n=6, 6,7%)**
	• Autoimmune disease **(n=4, 4,4%)**
	• Bradykinin-induced angioedema due to ACE-I **(n=3, 3,3%)**
	• Idiopathic angioedema **(n=3, 3,3%)**
	• Other diagnoses **(n=8, 8,9%)**

the emergency department (ED). Drug allergies also demonstrate subpar accuracy at 42%. Referral for further investigation is crucial not only to confirm but also to rule out allergy diagnoses, preventing potential avoidance of substances and impacting future medical care. Careful consideration is essential to avoid hasty allergy diagnoses in uncertain cases. Additionally, urticaria of diverse etiologies and dermatological disorders often masquerade as allergies in the ED.

References

(1) Turner PJ, Campbell DE, Motosue MS, Campbell RL. Global Trends in Anaphylaxis Epidemiology and Clinical Implications. J Allergy Clin Immunol Pract. 2020;8(4):1169-76.

(2) Alvarez-Perea A, Tomás-Pérez M, Martínez-Lezcano P, Marco G, Pérez D, Zubeldia JM, et al. Anaphylaxis in Adolescent/Adult Patients Treated in the Emergency Department: Differences Between Initial Impressions and the Definitive Diagnosis. J Investig Allergol Clin Immunol. 2015;25(4):288-94.

(3) Campbell RL, Park MA, Kueber MA, Jr., Lee S, Hagan JB. Outcomes of allergy/immunology follow-up after an emergency department evaluation for anaphylaxis. J Allergy Clin Immunol Pract. 2015;3(1):88-93.

Unraveling post-partum lymphocytic hypophysitis through repeat emergency room visits: A case report

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Citation
Elias, M., Vertommen, S., Philip, V. Unraveling post-partum lymphocytic hypophysitis through repeat emergency room visits: A case report.

Introduction

We present a case of a 32-year-old patient who presented multiple times to the emergency department with uncomplicated headache 10 months post-partum, leading to the eventual diagnosis of lymphocytic hypophysitis.

Case Presentation

A 32-year-old woman, who was 10 months postpartum (G2P2A0), had three presentations to the emergency department for headache. She reported a persistent throbbing frontal headache with severe exacerbations for 4 days with no other symptoms. Clinical neurological examination was strictly normal. On initial presentation, blood analysis showed an increased

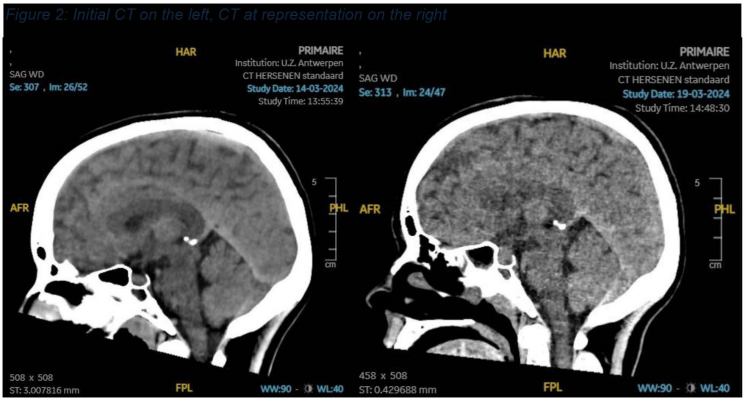

FIGURE 1

CRP value of 149,6 mg/L and computed tomography (CT) showed signs of sinusitis. Further infectious screening, including lumbar puncture, was unremarkable. The patient was discharged with the diagnosis of sinusitis and antibiotics and analgesics were initiated. However, she represented several times due to worsening symptoms. On the third presentation, five days after the initial visit, CT scan was retaken with intravenous contrast. This showed an enlargement of the pituitary gland with a diameter of 11 millimetres compared to the initial scan (**Figure 1**). The patient was admitted to the neurology ward and magnetic resonance imaging (MRI) showed gadolinium enhancement in the anterior pituitary gland and infundibulum in the T1-weighted images (**Figure 2**). Consequently, the definitive diagnosis of **lymphocytic hypophysitis** was established. As hormonal workup did not show any abnormalities, no corticosteroid replacement therapy was initiated. The patient was discharged with adequate pain control and anti-inflammatory agents if needed.

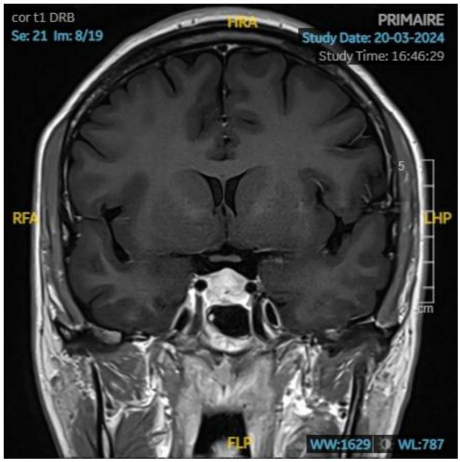

FIGURE 2
Gadolinium-enhanced MRI.

Discussion

Primary hypophysitis, a rare autoimmune disorder affecting the pituitary gland, presents a diagnostic challenge in clinical practice due to its low incidence, estimated at 1 in 9 million annually (1). Lymphocytic hypophysitis is its most common histological subtype and is strongly related to the postpartum state. Patients with hypophysitis typically present with headaches, visual field defects, ophthalmoplegia and hypopituitarism, resulting in various endocrine disturbances (2, 3). Confirmation of the diagnosis is obtained through tissue biopsy, but the diagnosis is often made through a combination of clinical history, pituitary hormone biochemistry and gadolinium-enhanced MRI of the pituitary gland (4). In this case, we advocate that a patient's return to the emergency department should be regarded as indicative of progression of illness and consequently, as a red flag. Furthermore, headaches during pregnancy or the postpartum period necessitate thorough investigation. If no clear cause for the headache can

be found in the post-partum period, a low threshold for additional imaging, preferentially MRI, is advised.

References

(1) Honegger J, Schlaffer S, Menzel C, Droste M, Werner S, Elbelt U, et al. Diagnosis of Primary Hypophysitis in Germany. J Clin Endocrinol Metab. 2015;100(10):3841-9.

(2) Hashimoto K, Takao T, Makino S. Lymphocytic Adenohypophysitis and Lymphocytic Infundibuloneurohypophysitis. Endocrine Journal. 1997;44(1):1-10.

(3) Saeger W. [Hypophysitis : Types and differential diagnosis]. Pathologe. 2016;37(3):230-7.

(4) Langlois F, Varlamov EV, Fleseriu M. Hypophysitis, the Growing Spectrum of a Rare Pituitary Disease. J Clin Endocrinol Metab. 2022;107(1):10-28.

Behavioural changes and aggression in young male in the ED – It's not always drugs. Susac syndrome case report

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Citation
Six, N., Hubloue, I. Behavioural changes and aggression in young male in the ED – It's not always drugs. Susac syndrome case report.

Introduction

Susac's syndrome is a rare auto-immune endotheliopathy leading to a characteristic clinical triad of encefalopathy, retinal vaso-occlusive disease and sensorineural hearing impairment [1,2]. Diagnosis is based on the clinical presentation, brain magnetic resonance imaging, retinal fluorescein angiography, and audiometry [1]. Because it is a rare disease with variable presentation, Susac syndrome is often missed and remains underdiagnosed. Therefore treatment is often started late, which can lead to sequalae such as dementia, blindness and permanent hearing loss [2].

Case Report

A 34 year old male presents at our emergency department with behavioural changes, confusion, headache and aggressive behaviour. Furthermore the patient has been experiencing vertigo, nausea, fatigue and is seeing black spots. In his medical history we only note migraines and mild case of bilateral

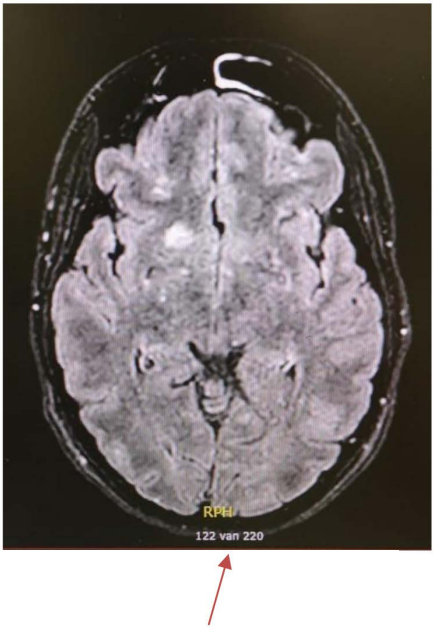

FIGURE 1
Brain magnetic resonance imaging (MRI) with coronal FLAIR illustrating snowball lesions.

otitis media. No medical history of mental illness or drug abuse. The patient is a pilot by profession. Initially the patient was categorized as non-urgent with suspicion of drug abuse and a psychiatric consult was ordered.

Upon physical examination the patient is rather bradyphrenic with word finding disorder. He also exhibits instable gait. The patient is not oriented in time. The facial lines were symmetrical, the tongue was extended centrally, the muscle strength and tone of the limbs was normal, and bilateral Babinski

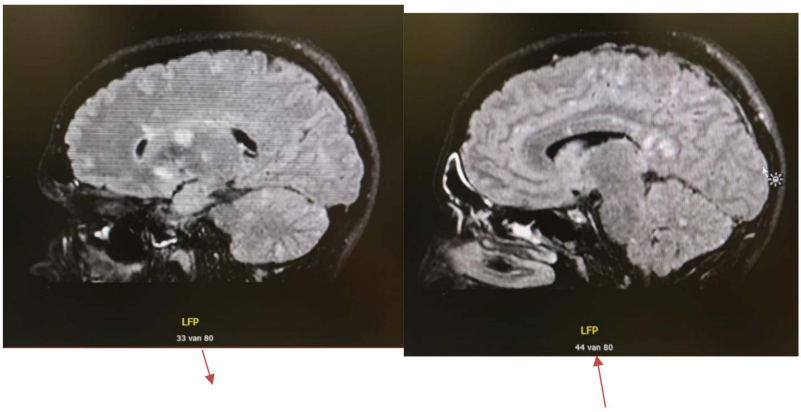

FIGURE 2
Brain magnetic resonance imaging (MRI) with sagittal FLAIR illustrating snowball lesions.

syndrome was negative. The neck was soft and Kernig syndrome negative. In supine position we note a nystagmus to the left. We also note a hearing loss in de the right ear. There was no abnormality in cardiopulmonary auscultation.

Initial labs show no abnormalities. ECG does not show any abnormalities. Lumbar puncture shows results within normal limits.

A non-contrast head CT showed nothing remarkable. Urgent magnetic resonance imaging (MRI) shows multiple hyperintense white matter lesions on fluid-attenuated inversion-recovery (FLAIR) sequence, located supra- and infratentorial in the corpus callosum, also known as 'snowball lesions', as seen in fig. 1 and 2 [3].

The patient was treated with high dose of methylprednisolone, 1000 mg intravenously daily for 5 consecutive days. A good response to initial

immunosuppressive treatment was noted and after a brief hospitalization the patient could leave the hospital for an ambulatory follow up.

Conclusion

When young people present in the emergency department with behavioural changes, confusion and episodes of aggression, we are often quick to jump to conclusions and go down the road of psychiatric differential diagnoses and/or drug abuse. This case offers an important message as it stresses the relevance of a profound mental and behavioural examination in patients with an "atypical" clinical presentation and a normal head CT. It will allow us to make an appropriate approach and diagnosis. The diagnosis of Susac syndrome can be established by a clinical triad of encephalopathy, vaso-oclussive disease and sensorineural hearing loss combined with magnetic resonance imaging.

References

[1] Pereira S, Vieira B, Maio T, Moreira J, Sampaio F. Susac's Syndrome: An Updated Review. Neuroophthalmology. 2020 May 1;44(6):355-360. doi: 10.1080/01658107.2020.1748062. PMID: 33408428; PMCID: PMC7746245.

[2] Marrodan M, Fiol MP, Correale J. Susac syndrome: challenges in the diagnosis and treatment. Brain. 2022 Apr 29;145(3):858-871. doi: 10.1093/brain/awab476. PMID: 35136969.

[3] Dierickx, J., Vanhoenacker, F. and Merckaert, V., 2021. Snowballs and Icicles in Susac's Syndrome. Journal of the Belgian Society of Radiology, 105(1), p.24.DOI: https://doi.org/10.5334/jbsr.2441

Bilateral external iliac artery intimal injury following blunt compression trauma

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Citation

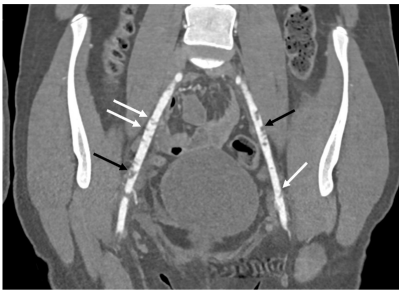
Margot, A., Vermeersch, W., Swinnen, J., Delbrassine, A., Gellens, P., Vandenbulcke, R., Gryspeerdt, S., Steverlynck, L. Bilateral external iliac artery intimal injury following blunt compression trauma.

Introduction

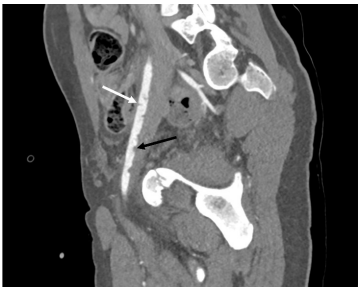
This case describes bilateral intimal lesions of the external iliac artery (EIA) following blunt compression trauma, a condition never previously described in literature. Moreover, it was complicated with limited intra-abdominal free fluid and two pelvic fractures.

Case

A prehospital team was sent to a 14-year-old girl with no significant medical history who had fallen off her horse onto her right side, after which the horse



A.



B.

FIGURE 1
Contrast-enhanced CT scan in the arterial phase. A, Oblique coronal plane along the axis of the external iliac arteries shows bilateral multifocal intimal flaps (white arrows) and intimal flaps with wall-adherent thrombi (black arrows). B, Oblique sagittal plane along the right external iliac artery demonstrates similar findings.

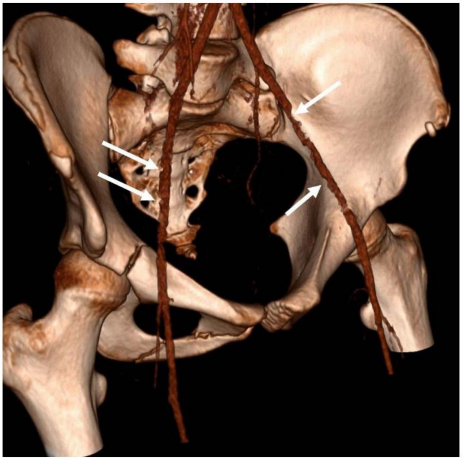


FIGURE 2
Three-dimensional CT angiography shows multiple filling defects (white arrows) over the full course of both external iliac arteries and the right-sided pelvic fracture consisting of an acetabular and a bifocal inferior pubic ramus fracture.

fell on her pelvis. She complained of abdominal pain and numbness of the right leg. Her vital signs showed RR 19/min, SpO_2 100%, HR 97bpm and BP 114/70mmHg. Physical examination showed normal peripheral pulsations. Polytrauma CT revealed a right acetabular fracture, a bifocal fracture of the right inferior pubic ramus and a fracture of the right medial Fig 1-2 malleolus. Multiple intimal flaps were noted in both EIAs. A small amount of intra-abdominal fluid was described, which the surgeons and emergency physician considered traumatic until proven otherwise. Doppler ultrasound showed bilateral arterial flow. After multidisciplinary discussion, enoxaparin 4000 IU daily and acetylsalicylic acid 80 mg daily were started. The girl was admitted to the intensive care unit for monitoring of limb perfusion and hemodynamics, which remained stable. Eight days later, CT angiography showed no more EIA injuries.

Discussion

EIA injury is rare, especially when followed by blunt trauma compared to penetrating trauma, because of its anatomical location and protection by the pelvis (1). Here, it is believed that tunica intima injuries are caused by the unique mechanism of blunt compression trauma rather than the well-known deceleration trauma. Normally, EIA injuries are significantly associated with hemodynamic instability (2). Most case reports agree that surgical repair is preferable because of the risk of extremity loss. Only two reports mentioned observation (3) or administration of anticoagulation of unspecified dose (4). Generally, ASH guidelines recommend prophylaxis with anti-Xa when a patient is at high risk of VTE (5).

Conclusion

The abovementioned unique EIA intimal lesions caused by blunt compression, led to controversy regarding appropriate treatment. Multidisciplinary discussions resulted in noninvasive treatment with anticoagulation, balancing the risk of worsening possible abdominal bleeding against the complication of a cold leg. This worked out well, but since this is the only report of such a case, we cannot claim that this is the single correct treatment. Since trauma cases are difficult to compare, a multidisciplinary case-by-case approach weighing risks and benefits remains the safest option.

List of Abbreviations

EIA, external iliac artery; *RR*, respiratory rate; *SpO_2*, oxygen saturation; *HR*, heart rate; *BP*, blood pressure; *VTE*, venous thromboembolism.

References

(1) Muck, P. E., Nunez, T. C., Hruska, L., Kasper, G. C., Chang, C., & Welling, R. E. (2002). Blunt Injury to the External Iliac Artery: A Case Report. *The American Surgeon*, *68*(1), 11–14. https://doi.org/10.1177/000313480206800103

(2) Tanizaki, S., Maeda, S., Ishida, H., Yamamoto, T., & Yoshikawa, J. (2017). Clinical characteristics of external iliac artery branch injury in pelvic trauma. *The American Journal of Emergency Medicine*, *35*(11), 1636–1638. https://doi.org/10.1016/j.ajem.2017.05.006

(3) Harris, D. G., Drucker, C. B., Brenner, M. L., Narayan, M., Sarkar, R., Scalea, T. M., & Crawford, R. S. (2014). Management and outcomes of blunt common and external iliac arterial injuries. *Journal of Vascular Surgery*, *59*(1), 180–185. https://doi.org/10.1016/j.jvs.2013.07.107

(4) Muckart, D. J. J., Pillay, B., Hardcastle, T. C., & Skinner, D. L. (2014). Vascular injuries following blunt polytrauma. *European Journal of Trauma and Emergency Surgery*, *40*(3), 315–322. https://doi.org/10.1007/s00068-014-0382-y

(5) Schünemann, H. J., Cushman, M., Burnett, A. E., Kahn, S. R., Beyer-Westendorf, J., Spencer, F. A., Rezende, S. M., Zakai, N. A., Bauer, K. A., Dentali, F., Lansing, J., Balduzzi, S., Darzi, A., Morgano, G. P., Neumann, I., Nieuwlaat, R., Yepes-Nuñez, J. J., Zhang, Y., & Wiercioch, W. (2018, November 27). *American Society of Hematology 2018 guidelines for management of venous thromboembolism: prophylaxis for hospitalized and nonhospitalized medical patients*. American Society of Hematology. https://ashpublications.org/bloodadvances/article/2/22/3198/16115/American-Society-of-Hematology-2018-guidelines-for

Invasive blood pressure monitoring made easy in the prehospital setting – A case of prehospital invasive blood pressure measurement in a TBI patient

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Citation
Mertens, B., Van den Brande, F., Lesaffre, B., Steen, E. Invasive blood pressure monitoring made easy in the prehospital setting – A case of prehospital invasive blood pressure measurement in a TBI patient.

Background

Traumatic Brain Injury (TBI) accounts for 37% of all injury-related deaths in trauma, yet there has been minimal improvement in outcomes over the past three decades (1). To increase survival in TBI patients, the whole chain of brain trauma care needs to improve, including the prehospital care. Prehospital Emergency Anaesthesia (PHEA) is often necessary for TBI patients.

However, post-intubation hypotension is prevalent and correlates with heightened mortality in trauma (2). TBI patients may benefit from prehospital invasive blood pressure (IBP) monitoring by facilitating prompt detection of hypotension, which is critical for neurological outcome (3). Currently, IBP monitoring is not deemed a practical option in the Belgian prehospital setting, while non-invasive blood pressure measurement (NIBP) may display significant measurement errors, especially at the extremes of blood pressure (4). Additionally, movements and vibrations often encountered on-scene and during transportation can interfere with NIBP measurements (4). Knapp et al. proposed that the time invested in placing an arterial cannula and even conducting prehospital blood gas analysis might be justified in severe TBI cases necessitating PHEA. In their study, neither prehospital nor on-site durations had any impact on mortality (5).

Case Report

Our medical rapid response car was dispatched to a 62-year-old male truck driver who fell from a height of 4 meters. He was found in an agitated, unresponsive state with an obstructed airway, necessitating PHEA. After induction the NIBP cycled for several minutes and finally displayed a pressure of 156/123 mmHg although the patient had a weak radial pulse. The radial artery was cannulated and an IBP of 74/48 mmHg was measured using a IBP sensor with a minimised flush system. Vasopressors were titrated to a target mean arterial pressure of 80 mmHg. The head CT scan revealed an occipitotemporal fracture with a significant subarachnoid haemorrhage, prompting the initiation of intracranial pressure (ICP) monitoring. While in the intensive care unit (ICU), a hemicraniectomy was conducted due to elevated ICP. Following a 69-day ICU admission, the patient was transferred to a rehabilitation center with a poor neurological status, characterised by right-sided hemiparesis and absence of verbal responsiveness.

Devices (Figure 1 and Table 1)

Time-consuming preparation of the pressure set can be an issue. Therefore, we searched for compact, easy-to-use devices for IBP monitoring that are distributed in Belgium (table 1, figure 1). We found 2 suitable devices with

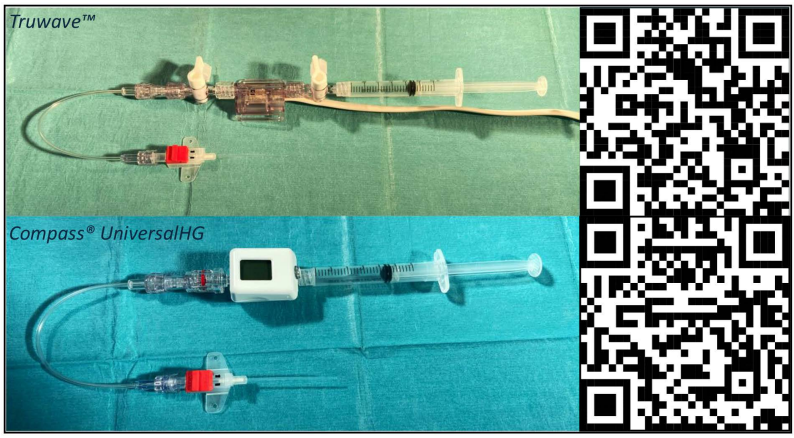

FIGURE 1
Picture and preparation of both devices.

TABLE 1: Characteristics of the devices

Name	Truwave™	Compass® UniversalHG
Producer	Edwards Lifesciences	Centurion Medical Devices
Distributor in Belgium	Edwards Lifesciences	Medline International
Price	€12	€180
Display	On patient monitor	Integrated digital display
Parameters	SBP, DBP, MAP	MAP
Waveform	Yes	No
Need for zeroing	Yes	No (self-calibrating)
Pressure range	-50 to +300 mmHg	-199 to +999 mmHg

SBP: systolic blood pressure ; DBP: diastolic blood pressure ; MAP: mean arterial pressure

different features. Both systems can be ready to connect in < 1 minute. The first device is a classic IBP sensor with a minimised flush system which is connected to a monitor screen displaying numerical values and a waveform.

The second device, originally designed for measuring compartment pressures, is a stand-alone pressure sensor with its own display showing a Mean Arterial Pressure (MAP).

Conclusion

In conclusion, prehospital IBP monitoring offers potential benefits in prehospital critical patient care, particularly in traumatic brain injury as indicated in this case report. However, its implementation requires careful consideration of indications and limitations. According to our experience the 2 devices presented may be practical and useful in the Belgian prehospital environment.

References

(1) Majdan M, Plancikova D, Brazinova A, Rusnak M, Nieboer D, Feigin V, Maas A. Epidemiology of traumatic brain injuries in Europe: a cross-sectional analysis. Lancet Public Health. 2016 Dec;1(2):e76-e83. doi: 10.1016/S2468-2667(16)30017-2. Epub 2016 Nov 29. PMID: 29253420.

(2) Price J, Moncur L, Lachowycz K, Major R, Sagi L, McLachlan S, Keeliher C, Steel A, Sherren PB, Barnard EBG. Predictors of post-intubation hypotension in trauma patients following prehospital emergency anaesthesia: a multi-centre observational study. Scand J Trauma Resusc Emerg Med. 2023 Jun 2;31(1):26. doi: 10.1186/s13049-023-01091-z. PMID: 37268976; PMCID: PMC10236576.

(3) Wildner et al. Resuscitation 82 (2011) 1198-1201 Arterial line in prehospital emergency settings – A feasibility study in four physician-staffed emergency medical systems. doi:10.1016/j.resuscitation.2011.05.002

(4) Standifird et al. Air Med J 41 (2022) 248-251 Initiation of Invasive Arterial Pressure Monitoring by Critical Care Transport Crews. doi:10.1016/j.amj.2021.11.006

(5) Knapp J, Doppmann P, Huber M, Meuli L, Albrecht R, Sollid S, Pietsch U. Pre-hospital endotracheal intubation in severe traumatic brain injury: ventilation targets and mortality-a retrospective analysis of 308 patients. Scand J Trauma Resusc Emerg Med. 2023 Sep 12;31(1):46. doi: 10.1186/s13049-023-01115-8. PMID: 37700380; PMCID: PMC10498564.

Near fatal vaginal injury caused by waterski

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Citation
Vanwalleghem, P., Steverlynck, L., Mandeville, Y., Mortier, D., Vandamme, S., Ryckaert, T. Near fatal vaginal injury caused by waterski.

Introduction

We describe a nearly fatal vaginal bleeding after waterskiing, with decision to perform an add-on interventional radiology. This report describes the first documented case of a water-related personal watercraft trauma in Belgium.

Case Report

A 56-year-old female in otherwise healthy conditions, was waterskiing at the local canal when she fell in the water. She felt a ripping vaginal sensation by a wave of water and blood oozing out of her vagina. Trying to stop the heavy bleeding by holding towels against her vagina, acquaintances brought her unannounced, to the emergency department in Menen, Belgium.

At presentation the patient was hemodynamic unstable. Inspection of the vagina showed towels who were drenched in blood. An extended

focused assessment sonography was performed and showed free fluid around the uterus. Following the inhospital protocol, 1g of tranexamic acid (Exacyl©) was given intravenously and the massive transfusion protocol was activated. Un urgent CT-scan showed a rupture of the vaginal cavity with an active arterial bleeding. In the operation room the senior gynaecologist sutured the perforation and packed the vagina. Meanwhile patient received polytransfusion and 3 grams of calcium gluconate intravenously. Although the perforation was sutured successfully and patient became hemodynamic stable, the active bleeding site was difficult to visualize. After peroperative counsel between the surgeon and radiologist, the decision was made to perform an embolization of both the arteriae iliaca internae. The patient was transported to the affiliated supraregional trauma centre in Roeselare. Postoperatively, patient was hospitalized at the intensive care unit where she remained hemodynamic stabile. Empiric high dose amoxiclavulanic acid intravenously was initiated.

Discussion

Water-skiing injuries with hydrostatic vaginal trauma have been described since 1990.[1] The theory was suggested that the vagina was acting as a conduit which directed the force of water to the upper vagina with perforation as a result. As such should these traumas be considered as penetrating trauma.[2] An overall mortality rate of 6.25% proves the potential life-threatening harm of these kind of traumas.[3] Seen the high mortality rate, a standardized management of these patient is necessary. Etienne et al. suggested an interdisciplinary approach with inclusion of adequate resuscitation and transfusion, rectovaginal examination, explorative laparoscopy or laparotomy for unstable patients, and empiric antibiotic coverage.[3] Damage control surgery could be a Hartmann's procedure or primary anastomosis of the perforation with rectal trauma, and transvaginal sutures of any vaginal lacerations. A laparotomy is recommended because, in addition to damage control, this may reveal vascular lesions. [4] The antibiotic used for empiric coverage needs to be adapted to the common waterborne species such as E. coli, Shigella, Campylobacter, Vibrio cholerae, Salmonella, Yersinia enterocolitica and Aeromonas hydrophila.[5]

In this case the decision was made to withhold from an explorative laparotomy seen the patient became hemodynamic stable after transvaginal suturing and polytransfusion. To stop the arterial bleeding the decision was made to perform an add-on embolization of both the arteriae iliaca internae rather than an explorative surgery. This case report is the first to describe this approach. In hindsight the use of a fluoroquinolone would have been a better choice for antibiotic coverage than high-dose amoxiclavulanic acid intravenously.

Conclusion

Vaginal injury after waterskiing is a possible deadly injury and needs to be addressed as a penetrating trauma. An interdisciplinary traumateam approach is imperative with a low threshold for transfusion and explorative laparoscopy or laparotomy. Empiric antibiotic coverage needs to be adapted to the common waterborne species.

References

[1] Wein P, Thompson DJ. Vaginal perforation due to jet ski accident. *Aust N Z J Obstet Gynaecol* 1990; 30: 384-385.

[2] Freeman MD, Everson TM, Kohles SS. Forensic epidemiologic and biomechanical analysis of a pelvic cavity blowout injury associated with ejection from a personal watercraft (jet-ski). *J Forensic Sci* 2013; 58: 237-244.

[3] Etienne JH, Rahili MA, Estran Mareva. Literature review on hydrostatic vaginal and anorectal injuries caused by personal watercraft. *Trauma* 2021; 23(4): 265-275.

[4] Haefner HK, Andersen HF, Johnson MP. Vaginal laceration following a jet-ski accident. *Obstet Gynecol* 1991; 78(5pt2): 986-988.

[5] Atlas I, Jerdev M, Younis JS, et al. Falling behind a jet ski: a sad end to a pleasure ride. *Trauma* 2016; 18(1): 65-69.

Solid organ transplantation originating from deceased donors in Europe: A narrative review

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Citation
Pionnier, Y., Genbrugge, C. Solid organ transplantation originating from deceased donors in Europe: A narrative review.

Human organ transplantation has begun in the 1960s with donation after circulatory death. Nowadays we are facing a significant shortage of transplant organs in Europe and worldwide. To increase the graft acceptance rate of organs originating from donation after controlled or uncontrolled circulatory death, preceding regional normothermic perfusion by an extracorporeal circulation before organs procurement or ex-situ machine perfusion of the organ are nowadays frequently implemented in clinical practice as organ assessment and reconditioning technique. First line actors like emergency department must be aware of this program to recognize and refer patients for donation especially in out of hospital situation.

This review provides an overview of organs transplanted from uncontrolled donation after circulatory death (uDCD) Table 1. Outcome of uDCD has

TABLE 1: Description of studies included in the review

Authors, Date , Country	Type of studies, Date of the study	Patient included, Organs procured	Inclusion criteria uDCD	Outcomes
De Antonio et al, 2007, Spain	Retrospective 2002 to 2006	54, Lungs	* Absence neoplasia, systemic diseases * 1 - 55 years * Witnessed CA * No flow < 15 min * WIT < 120 min * No traumatic massive bleeding	* 31,5 % effective donors * 17 lungs transplanted * 53 % PNF
Mateos-Rodriguez et al, 2010, Spain	Retrospective January 2008 to April 2009	28, Kidneys	* Absence neoplasia, systemic diseases * 1 - 55 years * Witnessed CA * No flow < 15 min * Arrival hospital < 90 min after CA * No traumatic massive bleeding	* 39 kidneys transplanted * 5,1 % PNF
Fondevila et al, 2012, Spain	Retrospective April 2002 to December 2010	290, Liver	* Absence neoplasia, systemic diseases * 1 - 65 years * Witnessed CA * No flow < 15 min * Arrival hospital < 90 min after CA * No traumatic massive bleeding	* 50 % effective donors * 34 livers transplantation * 82 % 1year graft survival
Mateos-Rodriguez et al, 2012, Spain	Retrospective January 2005 to April 2010	214, Kidneys, Liver and Lungs	* Absence neoplasia, systemic diseases * 1 - 55 years * Witnessed CA * No flow < 15 min * Arrival hospital < 90 min after CA * No traumatic massive bleeding	* 73,9 % effective donors * 302 organs trasnplanted * Functionality rate : 91 % for kidneys, 75 % for livers.
Hoogland et al, 2011, Nederlands	Retrospective January 1981 to January 2008	Unknown, Kidneys	* Absence neoplasia, systemic diseases * < 65 years * Witnessed CA * CPR < 45 min (<90 min in donors < 50 years) * Time between cessation of resuscitation and start of in situ preservation <45 min	* 83 effective donors * 138 kidneys transplanted * 22 % PNF * 63 % 5year graft survival
Peters-Sangers et al, 2017, Nederlands	Retrospective January 2002 to January 2012	133, Kidneys	* Absence neoplasia, systemic diseases * < 65 years * Witnessed CA * No flow < 20 min * Resusitation < 90 min after CA * WIT < 135 min	* 49,6 % effective donors * 97 kidneys transplanted * 19,6 % PNF * 60 % 5year graft survival
Lazzeri et al, 2020, Italy	Retrospective June 2016 to December 2018	25, Unknown	* 15 – 65 years * Witnessed CA * Relatives are present * No flow < 20 min * CA - hospital time < 90 min * WIT < 150 min	Unknown
Fieux et al, 2009, France	Prospective February 2007 to June 2008	63, Kidneys	* Absence neoplasia, systemic diseases * 18 - 55 years * Witnessed and refractory CA * No flow < 30 min * WIT < 150 min	* 43 % effective donors * 31 kidneys transplanted * 90 % 6months graft survival
Champigneulle et al, 2015, France	Prospective 2010 to 2012	126, Livers	* Absence neoplasia, systemic diseases * 18 - 54 years * Refractory CA * No flow < 15 min * WIT < 150 min	* 16,9 % effective donors * 11 livers transplanted * 27 % PNF * 82 % 1year graft survival
Dupriez et al, 2014, Belgium	Retrospective 1999 to 2014	39, Kidneys	* Absence neoplasia, systemic diseases * < 65 years * Witnessed and refractory CA * No flo < 30 min * WIT < 120 min	* 51 % effective donors * 25 kidneys transplanted * 5 % PNF * 86 % 1year graft survival

CA : cardiac arrest, PNF : primary non function, WIT : warm ischemia time

a lower effectiveness than DBD and controlled donation after circulatory death (cDCD) for short term graft survival (1-2). However, observational studies illustrate that longterm outcome from uDCD is comparable to graft outcome from cDCD and donation after brain death (DBD) (3-4). This review summarizes the studies reporting the procured organ rate and functional outcome of organs originated from uDCD.

European databases encourage the implementation of such uDCD programs. This donation is possible with good results so emergency department have to investigate the possibility of implementing such program. Nonetheless more research is necessary to make an estimation about the cost and benefits and to establish guidelines to select donors. Furthermore, the use of new technologies like extracorporeal Cardiopulmonary Resuscitation (E-CPR) for organ donation should be investigated from both a medical and economical perspective.

Bibliographie

(1) Lomero M, Gardiner D, Coll E, Haase-Kromwijk B, Procaccio F, Immer F, et al. Donation after circulatory death today: an updated overview of the European landscape. Transpl Int. janv 2020;33(1):7688

(2) Tang JX, Na N, Li JJ, Fan L, Weng RH, Jiang N. Outcomes of Controlled Donation After Cardiac Death Compared With Donation After Brain Death in Liver Transplantation: A Systematic Review and Meta-analysis. Transplant Proc. févr 2018;50(1):3341.

(3) West S, Soar J, Callaway CW. The viability of transplanting organs from donors who underwent cardiopulmonary resuscitation: A systematic review. Resuscitation. nov 2016;108:2733.

(4) Peters-Sengers H, Homan van der Heide JJ, Heemskerk MBA, Ten Berge IJM, Ultee FCW, Idu MM, et al. Similar 5-Year Estimated Glomerular Filtration Rate Between Kidney Transplants From Uncontrolled and Controlled Donors After Circulatory Death-A Dutch Cohort Study. Transplantation. juin 2017;101(6):114451.

Penetrating orbital injury: A narrative review for emergency clinicians

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Citation
Pirlet, F., flament, J. Penetrating orbital injury: A narrative review for emergency clinicians.

Introduction
Although rare, penetrating orbital trauma represents a major clinical challenge for emergency clinicians, often underdiagnosed and without clear guidelines, requiring a synthesis of best practices to standardize care.

Methods - Setting
This review aims to propose a standardized approach for emergency clinicians based on the latest evidence to improve clinical outcomes for patients with penetrating orbital injuries. The authors searched PubMed and Google Scholar for articles using the keyword and Medical Subject Heading "Penetrating orbital injury" OR "Transorbital injury" between 1970 and 2022. Authors reviewed and selected case reports, case series, reviews, clinical

guidelines, and reviews published in English with a focus on emergency medicine-relevant articles.

Discussion

Penetrating orbital injuries, although rare, present with a wide array of complications due to diverse injury mechanisms. The orbit's proximity to critical anatomical structures often results in significant morbidity; injuries are predominantly vision-threatening and can sometimes be life-threatening. This review highlights identified recurring injury patterns that are crucial for managing, diagnosing, and treating these injuries effectively. Complications range from infectious to ocular and cerebrovascular, influenced by the injury mechanism, entry point, and characteristics of the object involved, such as shape, composition, and velocity[1]. Non-occult injuries typically involve the medial orbital rim or eyelid, while occult cases, which might present with minor lateral eyelid injuries, risk being overlooked[2]. Radiological assessments are tailored based on the object's material, involving computed tomography or magnetic resonance imaging[3]. Initial emergency department treatment emphasizes resuscitation, broad-spectrum antibiotics, and tetanus prophylaxis, integrated with the latest advances in imaging and surgical techniques[4]. Early removal of the foreign object in a controlled setting and other specific interventions require a collaborative multidisciplinary approach, essential for optimizing patient outcomes[5].

Conclusion

By standardizing the management of penetrating orbital trauma, this review proposes a framework that can significantly enhance both the visual and overall prognosis of affected patients, representing a substantial advancement in emergency care. Penetrating orbital injury, though uncommon, poses complex diagnostic challenges. Systematic and multidisciplinary management in the emergency department is crucial for improving outcomes, emphasizing the need for an integrated approach to address this intricate type of head trauma effectively.

References

[1] Gonullu ME, Filinte GT, Cardak NG, Kucuk S, Akoz T. The Surgical Strategy for the Intraorbital Foreign Bodies. J Craniofac Surg. 2016;27(7):1785-1788. https://doi.org/10.1097/scs.0000000000002950

[2] Mzimbiri JM, Li J, Bajawi MA, Lan S, Chen F, Liu J. Orbitocranial Low-Velocity Penetrating Injury: A Personal Experience, Case Series, Review of the literature, and Proposed Management Plan. World Neurosurg. 2016;87:26-34. https://doi.org/10.1016/j.wneu.2015.12.063

[3] Mashriqi F, Iwanaga J, Loukas M, D'Antoni AV, Tubbs RS. Penetrating Orbital Injuries: A Review. Cureus. 2017;9(9):e1725. https://doi.org/10.7759%2Fcureus.1725

[4] Dehghanpour Barouj M, Tabrizi R, Behnia P, Alizadeh Tabrizi MA, Kheirkhahi M. Penetrating Orbital Injury; a Case Report and Treatment Algorithm. Arch Acad Emerg Med. 2020;8(1):e33. https://doi.org/10.22037/aaem.v8i1.582

[5] Schreckinger M, Orringer D, Thompson BG, La Marca F, Sagher O. Transorbital penetrating injury: case series, review of the literature, and proposed management algorithm. J Neurosurg. 2011;114(1):53-61. https://doi.org/10.3171/2010.8.jns10301

Cardiac arrest: Lysis or not lysis?

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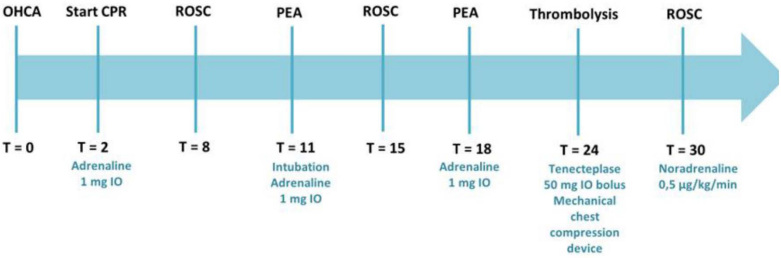
Citation
Marine, Q., Denis, R. Cardiac arrest: Lysis or not lysis?

Introduction

The use of thrombolysis during resuscitation is controversial. Currently, many countries (including Belgium) are facing a shortage of thrombolytic agents. In this context, is there still a place for thrombolysis in cardiac arrest?

Clinical Presentation

74-year-old woman who presented with sudden dyspnea at home associated with chest discomfort, nausea and vomiting. At Emergency Medical Services arrival, she suffered cardiac arrest. The sequence of cardiopulmonary resuscitation performed is described in Figure 1. After recovery of cardiac activity, the electrocardiogram was normal and the patient was transferred to the hospital. Echocardiogram on admission revealed dilation of the right chambers and the inferior vena cava. Computed Tomographic Pulmonary Angiography confirmed the presence of a right segmental embolism. The patient was admitted to the intensive care unit where she presented signs of bleeding diathesis (melena, multiple skin hematomas and a deep muscle hematoma) requiring a transfusion. Her hemodynamic status quickly improved and vasopressor support was stopped the same day. The patient left the hospital after 28 days with good neurologic outcome (Cerebral Performance Category score 1).



OHCA : out-of-hospital cardiac arrest , CPR : cardiopulmonary resuscitation, ROSC : return of spontaneous circulation, PEA : pulseless electrical activity, IO : intraosseous, T : time in minute

FIGURE 1
Advanced life support sequence.

Discussion and Conclusion

A recent meta-analysis[1], including 11 studies (3 randomized controlled trials), does not show any impact of thrombolysis of non-traumatic out-of-hospital cardiac arrests (OHCA) on survival to hospital discharge (Risk ratio [RR] 1.35 – 95% confidence interval [CI] 0.95 – 1.91). Subgroup analysis of the 3 studies focusing only on pulmonary embolism (PE) related OHCA shows similar results (RR 2.07 – 95% CI 0.64 – 5.63). Among these 3 studies, only the large prospective cohort of Javaudin et al.[2] shows a higher 30-day survival in PE-related OHCA (RR 2.43 – 95% CI 1.08 – 3.67). In this cohort, confirmed PE is very rare and represent 2.3% of all OHCA admitted alive to the hospital.

Accurate prehospital diagnosis of acute PE is particularly challenging. Clinical history and assessment, capnography and echocardiography (if available) can all assist in the diagnosis during CPR with varying degrees of specificity and sensitivity[3]. Cardiac arrest commonly presents as pulseless electrical activity. Common symptoms preceding cardiac arrest are sudden onset of dyspnea, pleuritic or substernal chest pain, cough, haemoptysis, syncope and signs of deep veinous thrombosis in particular (unilateral lower extremity swelling).

In view of the available studies and despite this period of shortage, thrombolysis is still an option in PE-related OHCA but it is important to carefully select patients (strong suspicion of PE, good prognosis linked to the cardiac arrest and limited patient's comorbidities). Thrombolysis should be administered as early as possible and resuscitation efforts must be continued between 60 and 90 minutes after administration[3].

References

[1] Alshaya et al. *Res Pract Thromb Haemost*. 2022;6:e12745.

[2] Javaudin et al. *Chest* 2019; 156:1167.

[3] Lott et al. *Resuscitation* 161 (2021) 152-219.

Impact of a sexual assault center, a retrospective study on adherence in post-exposure prophylaxis of victims of sexual violence

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Citation
Quirin, M., Kargar Samani, S., Bedoret, F., Malinverni, S. Impact of a sexual assault center, a retrospective study on adherence in post-exposure prophylaxis of victims of sexual violence.

Introduction

Victims of sexual assault who suffered from penetration are at risk of sexually transmitted diseases including the human immunodeficiency virus (HIV). To prevent HIV transmission, post-exposure prophylaxis (PEP) needs to be started and followed adequately(1). Therapeutic adherence being low amongst sexual assault victims(2,3), structures for specialized care called Sexual Assault Centers (SAC) have been created in Belgium . We conducted a study to evaluate their impact on the therapeutic adherence to PEP.

Methods

We conducted a retrospective before-after study to evaluate the impact of centralized and specialized care at a Sexual Assault Center (SAC) on

therapeutic adherence to Post-Exposure Prophylaxis (PEP). Victims attending the emergency service (between January 2011 and December 2017) were compared to those attended by the SAC (between January 2018 and February 2022). The primary objective was to assess the effect of the SAC on the adherence rate to post-exposure prophylaxis among victims of sexual assault. Clinical data were extracted from medical records. Univariate and adjusted logistic regression models were employed to assess the impact of the SAC on PEP adherence.

Results

The univariate analysis showed that characteristics associated with higher adherence rate were homosexual sexual orientation (OR: 2.42, 95% CI: 1.37–4.28, p=0.006), health insurance (OR: 1.71, 95% CI: 1.35–3.44, p= 0.001), psychological support (OR: 1.83, 95% CI: 1.36–2.45, p<0.001) and single-tablet treatment (OR: 1.57, 95% CI: 1.19–2.08, p=0.001). Moreover, being a migrant (OR: 0.76, 95% CI: 0.58–1.00, p= 0.049) and the victim of multiple abusers (OR: 0.63, 95% CI: 0.43–0.90, p=0.012) reduced adherence Table 1. The multivariate logistic regression, adjusted for known confounders, showed that victims who were taken in charge by the SAC were less adherent

TABLE 1: Analysis of factors influencing adherence

	Adherence		Univariate analysis		Multivariate analysis	
	Yes(n=440)	No(n=416)	OR (95% CI)	p value	OR (95% CI)	p value
SAC, No. (%)	236 (53.6)	217 (52.2)	1.06 (0.81 - 1.40)	0.666	0.67 (0.48 – 0.94)	0.021
Age, median (IQR)	25 (21-32)	26 (21-34)	0.99 (0.98 - 1.00)	0.110	0.98 (0.97 – 1.00)	0.032
Man, No. (%)	52 (11.8)	35 (8.41)	1.46 (0.93 - 2.29)	0.099		
Homosexuality, No. (%)	62 (14.1)	34 (8.17)	2.42 (1.37 - 4.28)	0.006	2.92 (1.57 – 5.42)	0.001
Health insurance, No. (%)	395 (89.8)	336 (80.7)	1.71 (1.35 - 3.44)	0.001	2.15 (1.27 – 3.67)	0.005
Migrant, No. (%)	200 (45.5)	218 (52.4)	0.76 (0.58 - 1.00)	0.049	0.79 (0.59 – 1.08)	0.136
Multiples aggressors, No. (%)	57 (13.0)	80 (19.2)	0.63 (0.43 - 0.90)	0.012	0.64 (0.43 – 0.96)	0.033
Amnesia, No. (%)	198 (45.0)	161 (38.7)	1.29 (0.98 – 1.70)	0.066	1.35 (1.00 – 1.82)	0.048
Link between victim and aggressor, No. (%)	159 (36.1)	153 (36.8)	0.97 (0.74 – 1.28)	0.845		
Working hours, No. (%)	147 (33.4)	120 (28.8)	1.24 (0.93 – 1.66)	0.144	1.22 (0.89 – 1.69)	0.216
Psychological support D5, No. (%)	171 (39.1)	107 (26.0)	1.83 (1.36 – 2.45)	0.000	2.02 (1.45 – 2.79)	0.000
STT, No. (%)	303 (68.9)	243 (58.4)	1.57 (1.19 – 2.08)	0.001	1.58 (1.13 – 2.20)	0.006

SAC, sexual assault centers; No, number; IQR, interquartile range; OR, odds ratio; 95% CI, 95% confidence interval; D5, first 5 days of treatment; STT, single-tablet treatment

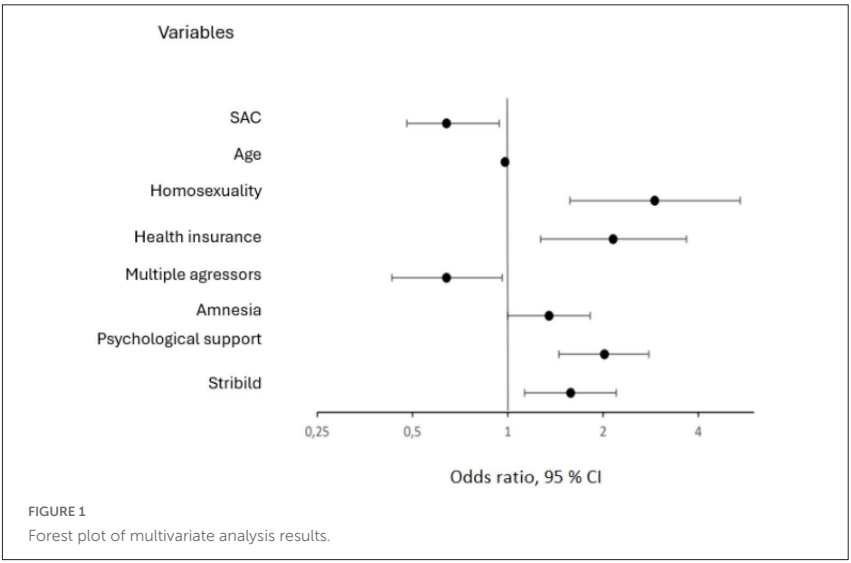

FIGURE 1
Forest plot of multivariate analysis results.

to the post-exposure treatment than those initially attended at emergency department (OR: 0.67, 95% CI: 0.48–0.94, p=0.021). Five independent factors promoting adherence were: homosexuality (OR: 2.92, 95% CI: 1.57–5.42, p=0.001), health insurance (OR: 2.15, 95% CI: 1.27–3.67, p=0.005), amnesia (OR: 1.35, 95% CI: 1.00–1.82, p=0.048), psychological support (OR: 2.02, 95% CI: 1.45–2.79, p< 0.001) and single-tablet treatment (OR: 1.58, 95% CI: 1.13–2.20, p=0.006). Being older (OR: 0.98, 95% CI: 0.97–1.00, p=0.032) and victim of multiple aggressors (OR: 0.64, 95% CI: 0.43–0.96, p=0.033) reduced adherence Figure 1.

Discussion

Individuals attending the Sexual Assault Center (SAC) manifest characteristics associated with heightened adherence (4,5). Furthermore, care provided at the SAC is positively correlated with increased psychological support. However, the multivariate logistic regression analysis reveals that being treated at the SAC is associated with an adjusted odds ratio of 0.67 for

completing the prescribed regimen. Potential explanations for these results may include the retrospective and monocentric nature of the study, the influence of the COVID-19 pandemic, insufficient emphasis on treatment during SAC visits, a potential stigma associated with SAC attendance, and the SAC center serving as a potential reminder of the assault and the associated trauma. Additional studies conducted outside epidemic contexts are needed, as our current findings do not permit the assertion that SAC enhances adherence in post-exposure prophylactic treatment for HIV.

References

(1) Tsai CC, Emau P, Follis KE, Beck TW, Benveniste RE, Bischofberger N et al. Effectiveness of post inoculation (R)-9-(2-phosphonylmethoxypropyl) adenine treatment for prevention of persistent simian immunodeficiency virus SIVmne infection depends critically on timing of initiation and duration of treatment. J Virol. 1998;72(5):4265-73.

(2) Chacko L, Ford N, Sbaiti M, Siddiqui R. Adherence to HIV post-exposure prophylaxis in victims of sexual assault: a systematic review and meta-analysis. Sex Transm Infect. 2012;88(5):335-41.

(3) Ford N, Irvine C, Shubber Z, Baggaley R, Beanland R, Vitoria M et al. Adherence to HIV postexposure prophylaxis: a systematic review and meta-analysis. AIDS. 2014;28(18):2721-7.

(4) Malinverni S, Gennotte AF, Schuster M, De Wit S, Mols P, Libois A. Adherence to HIV post-exposure prophylaxis: A multivariate regression analysis of a 5 years prospective cohort. J Infect. 2018;76(1):78-85.

(5) Nisida IVV, Boulos MC, da Silva LMB, Mayaud P, Avelino-Silva VI, Segurado AC. Predictors of Adherence to HIV Post-Exposure Prophylaxis and Retention in Care After an Episode of Sexual Violence in Brazil. AIDS Patient Care STDS. 2019;33(9):399-405.

Bilateral internal carotid artery dissection following near hanging – A case report and review of literature

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Citation
Segers, L., Sabbe, M. Bilateral internal carotid artery dissection following near hanging – A case report and review of literature.

Introduction

Hanging is a frequent method of suicide worldwide. In the emergency department (ED) we frequently encounter patients following an attempted suicide. A regional registry of suicide attempts in Flanders in 2020 noted 25 attempted suicides every day, 8% of which were hangings, making near-hanging the third most common presentation, preceded by poisoning and self-harm with sharp objects (1). Blunt cerebrovascular injury (BCVI) is among the injuries seen following near-hanging.

Case Report

We present a case of bilateral internal carotid artery dissection following near hanging. A 43-year-old patient was released from hanging after approximately six minutes, after a friend cut the rope. On arrival of the emergency medical services he was spontaneously breathing, but

unconscious with a Glasgow Coma Scale (GCS) of 3, prompting intubation and mechanical ventilation. On arrival in the ED he was sedated. His pupils were mydriatic and reactive to light and we identified abrasions in the anterior part of the neck. No further external injuries were observed. Atrial fibrillation was noted on ECG. A CT of the brain demonstrated no abnormalities. CT angiography (CTA) revealed bilateral dissection of the internal carotid arteries on both sides without occlusion. Treatment with a therapeutic dose of low-molecular-weight heparin was initiated (Enoxaparin 60 mg twice daily). Two days after the attempt, he was weaned from ventilation and without neurological sequelae. He was transferred to the psychiatric ward on day 5 and returned home on day 10. Enoxaparin was continued for one month.

Discussion

BCVI following near-hanging is reported with variable incidence, ranging from 2 to 6% (2). Bilateral vascular injury is rare and reporting thereof limited to case reports. While there is a trend for liberal screening for BCVI with CTA in general trauma care, recent reports suggest more selective imaging in near-hanging patients.

Berke suggests a work-up with CTA if one of the following criteria is present: GCS < 15, loss of consciousness, high energy mechanism, significant time suspended or in the field (30 minutes) (3). Ribaute argues for CTA in patients with one or more of the following 3 criteria: GCS < 8, cardiac arrest, need for assisted ventilation (4). In view of their low rates of BCVI in patients with normal GCS scores following hanging, Schuberg and Subramanian argue that these patients can be sufficiently clinically examined for determining a need for specific imaging (5), (6). These recommendations are based on retrospective observational studies, often without standard work-up, varying rates of CTA use and limited follow-up. In one study, CTA was only carried out in 40% of patients with normal GCS (6).

However the consequences of missed or delayed diagnosis of BCVI can be devastating (stroke, death) and can be prevented by early treatment with

antithrombotic therapy. Management of patients following near-hanging remains challenging due to the complexity of presentation and the paucity of evidence concerning diagnostic work-up and treatment.

Since the level of evidence for limited screening remains low, we continue to screen for vascular injury in all near-hanging patients.

References

(1) Vancayseele N, van Heeringen C, Portzky G. De epidemiologie van suïcidepogingen in Vlaanderen. https://www.eenheidzelfmoordonderzoek.be/: Universiteit Gent; 2020.

(2) Bordia R, Freeman C, Kou HH, Culhane J. Do we need neuroimaging in every case of near-hanging?: experience from a level 1 trauma center and analysis of the National Trauma Data Bank. Emerg Radiol. 2021;29(1):49-57.

(3) Berke DM, Helmer SD, Reyes J, Haan JM. Injury Patterns in Near-Hanging Patients: How Much Workup is Really Needed? Am Surg. 2019;85(5):549-55.

(4) Ribaute C, Darcourt J, Patsoura S, Ferrier M, Meluchova Z, Gramada R, et al. Should CT angiography of the supra-aortic arteries be performed systematically following attempted suicide by hanging? J Neuroradiol. 2021;48(4):271-6.

(5) Schuberg S, Gupta N, Shah K. Aggressive imaging protocol for hanging patients yields no significant findings: Over-imaging of hanging injuries. Am J Emerg Med. 2019;37(4):737-9.

(6) Subramanian M, Hranjec T, Liu L, Hodgman EI, Minshall CT, Minei JP. A case for less workup in near hanging. J Trauma Acute Care Surg. 2016;81(5):925-30.

Bullet fragments and the limitations of plain X-rays - A case report

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Sergoynne, L., Janssens, E., Dehandschutter, C., Verdonck, P. Bullet fragments and the limitations of plain X-rays - A case report.

Introduction

Gunshot injuries (GSI) have a low incidence on the European mainland when compared to other regions, but they often result in unexpected, unanticipated, and complex injury patterns, leading to substantial morbidity and mortality. The low incidence of GSI leads to limited clinical exposure and individual expertise, underscoring the importance of proper management regarding imaging and treatment. Therefore, we report a case of a fragmented bullet causing a dissection of the anterior tibial artery.

Case Report

A 19-year-old female presented at the Emergency Department (ED). She witnessed her sister being shot in their garage, but she did not consider herself injured. Her sister sustained injuries incompatible with life and died in our ED. When bringing the news, the emergency physician noticed the 19-year-old sister was limping, and a clinical examination identified a small gunshot entry wound in the middle third of the left lower leg. The wound was not actively bleeding, and neurovascular status was normal. An X-ray of the lower leg did not show a fracture, but demonstrated a foreign body of 5 mm posteriorly to the mid-shaft of the tibia (Fig 1). The patient was discharged inadvertently, but we called her back to assess any vascular injuries. A

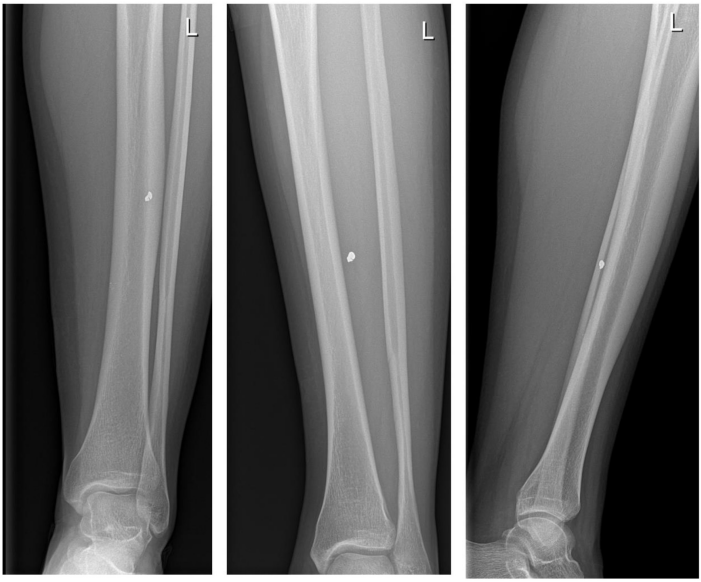

FIGURE 1

X-ray of the left lower leg, showing a foreign body of 5 mm posteriorly to the mid-shaft of the tibia, without signs of a fracture.

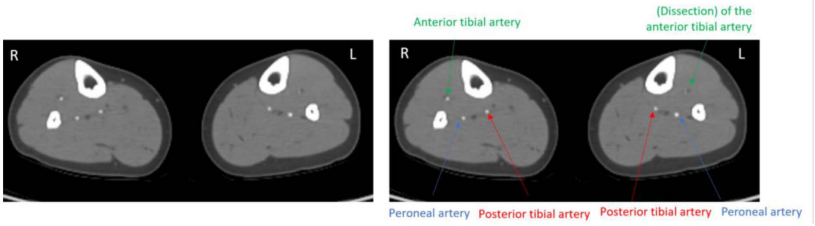

FIGURE 2
CT angiography of the leg and abdomen, showing a vascular occlusion at the level of the left anterior tibial artery.

subsequent CT angiography of the lower extremity and the abdomen was performed and showed an occlusion of the anterior tibial artery due to a dissection (Fig 2). As an arterial duplex study showed a triphasic signal in the dorsal tibial and posterior tibial arteries and the neurovascular status was not compromised, conservative management was proposed regarding the dissection, involving analgesics as needed and a follow-up consultation at the vascular surgery department. We did not initiate prophylactic antibiotics. The wound was cleaned, and local debridement was performed. The patient gained full recovery regarding this GSI and its complications.

Discussion

Ballistic trauma can cause tissue damage directly and indirectly through the transmission of energy dissipated by the projectile [1]. Conventional X-rays can show bullet fragments and identify fractures. Since these bullets have an unpredictable trajectory, can migrate through all tissues, including bone and even the bloodstream, and can cause significant vascular disruption, a CT angiography with the anatomical compartment adjacent both to the entry and exit wound included, should always be performed. Consequently, CT angiography serves as the standard imaging modality when assessing any type of ballistic trauma [2].

While prophylactic antibiotics are not universally indicated for GSI to the extremities, they may be warranted in specific anatomical sites (intra-articular areas, hands, feet, pelvis, or distal tibia) or in the presence of an adjacent fracture [3-5]. Removal of the bullet is not always indicated, but strict indications for excision include intra-articular, cerebrospinal fluid, intervertebral disc, or intraocular locations, as well as nerve/nerve root impingement or intravascular presence (risking embolization or ischemia). In all other cases, the indication should be critically evaluated, considering the risk of additional tissue damage, infection, iatrogenic neurovascular injury and bleeding [2]. Nevertheless, the absence of definitive guidelines emphasises the need for further research.

References

[1] Baum GR, Baum JT, Hayward D, MacKay BJ. Gunshot Wounds: Ballistics, Pathology, and Treatment Recommendations, with a Focus on Retained Bullets. Orthopedic research and reviews. 2022;14:293-317.

[2] Dienstknecht T, Horst K, Sellei RM, Berner A, Nerlich M, Hardcastle TC. Indications for bullet removal: overview of the literature, and clinical practice guidelines for European trauma surgeons. European journal of trauma and emergency surgery: official publication of the European Trauma Society. 2012;38(2):89-93.

[3] Goldberg SR, Anand RJ, Como JJ, Dechert T, Dente C, Luchette FA, et al. Prophylactic antibiotic use in penetrating abdominal trauma: an Eastern Association for the Surgery of Trauma practice management guideline. The journal of trauma and acute care surgery. 2012;73(5 Suppl 4):S321-5.

[4] Burg A, Nachum G, Salai M, Haviv B, Heller S, Velkes S, et al. Treating civilian gunshot wounds to the extremities in a level 1 trauma center: our experience and recommendations. The Israel Medical Association journal: IMAJ. 2009;11(9):546-51.

[5] Brand M, Grieve A. Prophylactic antibiotics for penetrating abdominal trauma. The Cochrane database of systematic reviews. 2019;12(12):Cd007370.

Typical chest pain, an atypical diagnosis: Spontaneous coronary artery dissection

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Introduction

As chest pain is a frequent complaint in the emergency department (ED), emergency physicians should consider spontaneous coronary artery dissection (SCAD) as a differential diagnosis. SCAD includes the spontaneous dissection of a coronary blood vessel unrelated to trauma, atherosclerosis or iatrogenic causes. Patients with SCAD are at a significant risk of being mistakenly discharged or undergoing incomplete investigations due to their often young age and absence of cardiovascular risk factors.

Case Report

The ambulance was dispatched for a 41-year-old woman, without any medical history, complaining of chest pain. Upon arrival of the ambulance, the patient was awake with normal vital signs. Shortly afterwards, she collapsed. Cardiopulmonary resuscitation (CPR) was initiated, and one shock was administered due to ventricular fibrillation. During CPR the patient was

already showing signs of life allowing the CPR to be stopped after +/- 5 minutes. She was sedated, intubated and transported to the hospital.

Upon arrival at the hospital, a complete workup was conducted. ECG showed no ST elevations, blood analysis revealed no abnormalities except for serially increasing troponins and elevated D-dimers. CT angiography of the thorax ruled out pulmonary embolism. Echocardiography revealed diffuse hypokinesia and slightly impaired left ventricle ejection fraction (LVEF). Coronary angiography showed clear coronary arteries without atherosclerosis. Mild narrowing of the ramus circumflex due to spasms was noted (associated with vasopressor use), which improved after administration of intra-coronary isosorbide dinitrate. LVEF was measured at 40% with basal hypokinesia, consistent with Takotsubo cardiomyopathy, the initial diagnosis upon admission to the intensive care unit (ICU).

Following multidisciplinary discussion the next day, it was decided to perform an optical coherence tomography (OCT), which revealed a SCAD of the left main coronary artery and proximal circumflex artery. Additional angiography of the iliac vessels revealed diffuse irregularities suspicious for fibromuscular dysplasia.

The patient was sedated, intubated and received adrenergic medications. Given a positive COVID test, empirical treatment with dexamethasone and remdesivir was initiated, alongside augmentin due to the risk of aspiration during the collaps. She didn't receive PCI, anticoagulation or DAPT. After tapering of adrenergic medications betablockers, ACE-inhibitor, statin and aspirin were associated.

The patient was weaned off the ventilator without any neurological deficits one day after admission. After 72 hours vasopressor support could be discontinued. 4 days later the patient was able to leave the ICU to the regular cardiology ward, with discharge home 2 days later. An additional CT angiography and a review of cardio-genetics were arranged to exclude underlying fibromuscular dysplasia and rule out hereditary connective tissue disorders.

Discussion

It is important for clinicians to include SCAD in the differential diagnosis when young, female patients present with chest pain, as the approach and treatment differs from atherosclerotic ACS. A thorough evaluation, including serial troponins and ECG's, should be conducted before considering discharge from the ED.

Stab wound entry, just the tip of the iceberg

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Citation
Six, N., Hubloue, I. Stab wound entry, just the tip of the iceberg.

Introduction

Stab wounds occasionally present in emergency situations. They often present in the context of assault, where the victim may not be aware of the type of weapon used or the length and depth of penetration. From the outside, the wound often appears small and trivial. Depending on the location, this can lead to significant injuries that may be missed if the wounds are superficially sutured and no further imaging is performed.

Case Report

A 36-year-old woman with no significant past medical history presented to the emergency department at the recommendation of the police. Earlier that evening, she has been stabbed by her ex-boyfriend during an argument. The wound was located around the paravertebral musculature at the L1-L2 level. Superficial suturing had already been performed at a nearby hospital. Needing documentation to file a police report, she returned to the emergency department for a head to toe examination. Her vital signs were within normal limits: heart rate 101 bpm, blood pressure 136/76 mmHg, and oxygen saturation 100% on room air. A 3cm laceration with surrounding swelling was noted along the dorsal spine. Her abdomen was soft but tender

to palpation in the left hypochondrium. Bilateral lung auscultation was clear. Due to the location of the wound and the developing hematoma around the entry site, a contrast-enhanced CT scan of the thorax and abdomen was performed. This revealed a non-displaced rib fracture posterolaterally at rib 12 and a linear laceration of the left kidney (approximately 2.5cm) along the trajectory of the stab wound, with diffuse infiltration of perinephric fat tissue and surrounding free fluid in the perinephric and perisplenic regions. No active bleeding or injury to the urinary tract were noted. Additional blood tests showed normal hemoglobin levels and stable kidney function. A minimal amount of microscopic hematuria was noted, possibly related to the patient's menstrual cycle. The patient was admitted to a monitored unit for hemodynamic monitoring and frequent hemoglobin checks. The following day, she was transferred to the urology department, and after 72 hours of reassuring observation, the patient was discharged home. Bed rest for 14 days and adequate hydration were recommended, along with a 5-day course of empiric Augmentin due to the unknown and possible contaminated origin of the penetrating object.

Conclusion

Despite the fact that the entry wound in some stab wounds may appear very small, missing a significant injury can have major consequences. Even small stab wounds can penetrate deep tissues and affect organs and blood vessels. Failure to detect these injuries in the early stages can have life-threatening consequences. Stab wounds increase the risk of infection, especially if the knife or penetrating object was not clean. Failure to treat this promptly can lead to abscesses, sepsis, or other serious complications. Therefore, it is vital that emergency medical professionals carefully assess all stab wounds, regardless of their size, to prevent potential complications and provide the best care to the patient.

Agreement between implicit clinical assessment and PRISMA-7 to detect frailty among older patients in the emergency department

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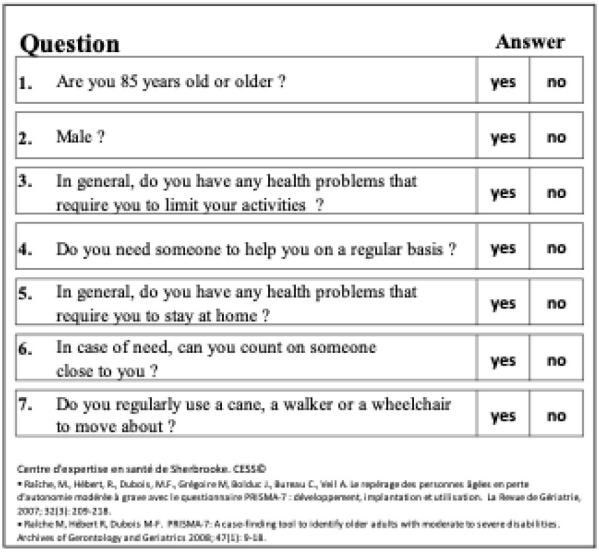
Citation

Steenebruggen, F., L'olivo, T., Dekeister, A-C., Dupriez, F., Marien, S. Agreement between implicit clinical assessment and PRISMA-7 to detect frailty among older patients in the emergency department.

Introduction

Caregivers are faced with an increasing proportion of elderly patients in the emergency department (ED) [1]. The early detection of frailty is essential to preserve the autonomy of these patients and to prevent morbidity and mortality [2 ; 3]. There are numerous screening tools for frailty, including the seven-item questionnaire known as "Program of Research to Integrate Services for the Maintenance of Autonomy" (PRISMA-7 ; figure 1), which has demonstrated good feasibility in the ED [4]. Implicit clinical assessment is another simple way to screen for frailty [5].



Question		Answer	
1.	Are you 85 years old or older ?	yes	no
2.	Male ?	yes	no
3.	In general, do you have any health problems that require you to limit your activities ?	yes	no
4.	Do you need someone to help you on a regular basis ?	yes	no
5.	In general, do you have any health problems that require you to stay at home ?	yes	no
6.	In case of need, can you count on someone close to you ?	yes	no
7.	Do you regularly use a cane, a walker or a wheelchair to move about ?	yes	no

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• Raîche, M., Hébert, R., Dubois, M.F., Grégoire M, Boiduc J, Bureau C, Veil A. Le repérage des personnes âgées en perte d'autonomie modérée à grave avec le questionnaire PRISMA-7 : développement, implantation et utilisation. La Revue de Gériatrie, 2007; 32(3): 209-218.
• Raîche M, Hébert R, Dubois M-F. PRISMA-7: A case-finding tool to identify older adults with moderate to severe disabilities. Archives of Gerontology and Geriatrics 2008; 47(1): 9-18.

FIGURE 1

Program of research to integrate services for the maintenance of autonomy 7-item questionnaire (PRISMA-7).

Raîche, M.; Hébert, R.; Dubois, M.-F. PRISMA-7: A case-finding tool to identify older adults with moderate to severe disabilities. Arch. Gerontol. Geriatr. 2008, 47, 9–18

TABLE 1: Value of the Kappa concordance coefficient and its 95% confidence interval in the evaluation of frailty by the PRISMA score and according to the doctor's clinical impression

		Prisma-7 score		
		Non-frail : PRISMA < 4	**Frail : PRISMA ≥ 4**	**Total**
Physician clinic impression	Non-frail	28	9	37
	Frail	31	69	100
	Total	59	78	137

Kappa {IC95%}	0.376 {0.077}
P-value	< 0,001

This study evaluates the agreement between the initial implicit clinical assessment made by the emergency physician and the PRISMA-7 results. Secondary objectives are to compare the influence of frailty based on the implicit clinical assessment or PRISMA-7 on the patient's discharge destination after the ED.

Methods

This single-center observational prospective study was conducted over a 7-month period from June to December 2021. We included all eligible patients aged 75 years or older admitted to the ED of the Cliniques Universitaires Saint Luc in Brussels, Belgium. Frailty was assessed using the PRISMA-7 score, which was carried out by an investigating doctor independent of the patient's care. Frailty was then assessed by the physician in charge of the ED, who had no knowledge of the patient's medical records and was blind to the PRISMA-7 score.

Results

Regarding the evaluation of frailty in elderly patients, the agreement between the emergency physician's initial clinical impression and the PRISMA-7 score was fair based on Cohen's kappa with a coefficient of 0.38 (95% CI 0.3-4.53) (Table 1). Patients assessed as frail according to the PRISMA-7 score were significantly more hospitalized than those assessed according to the

physician's initial clinical assessment (p=0.012). The total number of hospital admissions between the two groups was not significantly different.

Discussion

This study shows a fair agreement between the PRISMA-7 score and the implicit clinical assessment of frailty upon admission to the ED. The systematic use of the PRISMA-7 score in the ED would allow the identification of frail patients who might otherwise go undetected.

References

[1] https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing

[2] Lucke JA, Mooijaart SP, Heeren P, Singler K, McNamara R, Gilbert T, Nickel CH, Castejon S, Mitchell A, Mezera V, Van der Linden L, Lim SE, Thaur A, Karamercan MA, Blomaard LC, Dundar ZD, Chueng KY, Islam F, de Groot B, Conroy S. Providing care for older adults in the Emergency Department: expert clinical recommendations from the European Task Force on Geriatric Emergency Medicine. Eur Geriatr Med. 2022 Apr;13(2):309-317. doi: 10.1007/s41999-021-00578-1. Epub 2021 Nov 5. PMID: 34738224; PMCID: PMC8568564.

[3] Ofori-Asenso R, C. K., Sahle B, Mazidi M, Zullo A, Liew D. (2020). "Frailty Confers High Mortality Risk across Different Populations: Evidence from an Overview of Systematic Reviews and Meta-Analyses. ." Geriatrics 5: 14, doi: 10.3390/geriatrics5010017.

[4] Hoffmann S, Wiben A, Kruse M, et al. Predictive validity of PRISMA-7 as a screening instrument for frailty in a hospital setting. BMJ Open 2020;10:e038768. doi:10.1136/ bmjopen-2020-038768

[5] Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. J Gerontol A Biol Sci Med Sci 2004;59:255—63.

Fat embolism syndrome after a lateral tibial plateau fracture: A case report

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Citation

Joanne, V.B., Philip, V., Eva, J. Fat embolism syndrome after a lateral tibial plateau fracture: A case report.

Introduction

Fat embolism syndrome (FES) typically manifests in patients with long bone fractures but also occurs in other types of fractures, crush injuries, burns, and non-traumatic conditions. The exact incidence of FES is estimated to be less than 1% in orthopaedic and trauma patients. In this case report, FES was observed in a patient with a tibial plateau fracture, an uncommon fracture to cause FES, making it a challenging diagnosis.

Case Report

A 37-year-old man with no significant medical history presented to the emergency department (ED) following a work-related crush injury to the left lower leg. The leg was splinted and immobilized on scene. Upon admission the patient's vital signs and neurological status were normal. Examination after removal of the splint showed a swollen left knee and degloving injury of the left ankle and foot. CT angiography revealed a minimally depressed and displaced lateral tibial plateau fracture, and a calcaneal fracture. After urgent debridement of the degloving injury, the patient was admitted to the orthopaedic ward. The tibial plateau and calcaneal fractures were managed conservatively with application of a cast, and low molecular weight heparins were started. Twelve hours post-injury, the patient was found hypoxic with an oxygen saturation of 88%, and a Glasgow Coma Scale (GCS) of 6/15 (E1M4V1) without signs of lateralization. Blood analysis, cranial CT and CT pulmonary angiography were performed. Laboratory findings revealed mild inflammation (white blood cell count of 12,5 x 10^9/L, with a C-reactive protein of 89 mg/dL), and a mild acute renal insufficiency (creatinine of 1,14 mmol/L), with no other noteworthy abnormalities (including a normal thyroid-stimulating hormone level of 1,09 mU/L and a normal glucose level). Cranial CT findings were unremarkable, whereas CT pulmonary angiography demonstrated lung consolidations with mild interstitial pulmonary oedema, ruling out pulmonary embolism. In the light of the negative cranial CT, an MRI of the brain was performed, revealing a 'starry night' or 'starfield' pattern consistent with diffuse cerebral fat emboli. The patient was transferred to the stroke unit ward for further monitoring. Transoesophageal echocardiography revealed no evidence of a patent foramen ovale. The patient's clinical status spontaneously improved, with only mild bradyphrenia and mild cognitive impairment upon discharge.

Discussion

FES is an infrequent complication associated with trauma. This case report documents an uncommon aetiology of FES with a tibial plateau fracture, underscoring the diagnostic complexity inherent to such presentations. Notably, the concomitant calcaneal fracture and crush injury further

confound the attribution of FES solely to the tibial plateau fracture. Therefore, definitive determination of the causality is challenging.

In conclusion, FES is a diagnosis that warrants consideration, irrespective of the specific facture type. The treatment is purely supportive and symptomatic, with early fracture immobilization and reduction representing pivotal interventions in mitigating FES risk. [1,2,3,4,5]

References

[1] Luigi Vetrugno et al., "Cerebral Fat Embolism after Traumatic Bone Fractures: A Structured Literature Review and Analysis of Published Case Reports". *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 29, no. 1 (March 12, 2021): 47, https://doi.org/10.1186/s13049-021-00861-x.

[2] C Timon, C Keady, and CG Murphy, "Fat Embolism Syndrome – A Qualitative Review of Its Incidence, Presentation, Pathogenesis and Management". *Malaysian Orthopaedic Journal* 15, no. 1 (March 2021): 1–11, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8043637/.

[3] Ethan Kosova, Brian Bergmark, and Gregory Piazza, "Fat Embolism Syndrome". *Circulation* 131, no. 3 (January 20, 2015): 317–320, https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.114.010835.

[4] Jacob George et al., "Fat Embolism Syndrome". *Lung India : Official Organ of Indian Chest Society* 30, no. 1 (2013): 47–53, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3644833/.

[5] Daniel Agustín Godoy, Mario Di Napoli, and Alejandro A. Rabinstein, "Cerebral Fat Embolism: Recognition, Complications, and Prognosis," *Neurocritical Care* 29, no. 3 (December 2018): 358–365.

First Belgian prehospital blood transfusion program: Logistics and protocol

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Citation
Van den Brande, F., Vanhoenacker, S., Cauwelier, B., Steen, E. First Belgian prehospital blood transfusion program: Logistics and protocol.

Background

Hemorrhagic shock and exsanguination are major causes of death in trauma patients. Although bleeding control and blood transfusion are the cornerstones in the initial in-hospital treatment, none of the Belgian prehospital medical teams carry blood products. The literature concerning the benefits of prehospital blood transfusion is still ambiguous (1, 2).

Logistics (figure 1)

In October 2023 the Helicopter Emergency Medical Service (HEMS) in Brugge started (as first Belgian prehospital team) to carry 2 units of O Rh-negative erythrocyte concentrate (ECL). In January 2024 we added 3 bottles of lyophilized plasma (OctaplasLG produced by Octapharma). Since May 2024 the program was expanded to the rapid response car. So we carry more than 1000 mL of blood products in each vehicle.

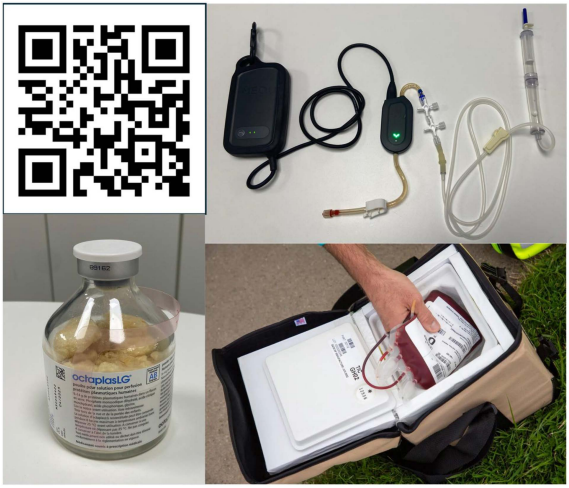

FIGURE 1
OctaplasLG, Credo ProMed™ box, °MEQU °M Warmer.

ECLs are stored in validated passive cooled boxes (Credo ProMed™ bags produced by Peli Biothermal™). The transfusion lab prepares the cold packs, put 2 units ECLs and a temperature tag in the box before sealing it. The cold packs consist of phase change material that maintain a steady temperature of 6°C inside the box for at least 24 hours.

Every sealed box is changed every 24 hours with a new box prepared by the transfusion lab. When the ECLs are not used, the temperature tag is checked in the lab and the ECLs return into the hospital blood bank.

The lyophilized plasma is reconstituted just before transfusion by adding 200 mL of water to the bottle.

Blood products are transfused by large-bore tubing through a portable blood warming device (°M Warmer System produced by °MEQU) which warms the blood from 5°C to 37°C at a flow rate of 150 mL/min.

Patient Selection

All shocked patients are evaluated for mechanism of injury, (evolution of) vital signs and clinical findings. Ultrasound and the 'hateful eight' (table 1) can be helpful to confirm bleeding or exclude 'bleeding mimics' such as tension pneumothorax, cardiac tamponade, neurogenic shock and vasoactive traumatic brain injury. With all this information the physician can decide to transfuse the patient when systolic blood pressure < 90 mmHg and there are signs of major bleeding based on the first evaluation.

Transfusion

Bleeding control (direct pressure, pelvic binder, tourniquet, ...) always takes priority over transfusion. Before transfusion is initiated, we collect standard blood samples and treat all patients with tranexamic acid and calcium. A separate large-bore IV access is used for transfusion of the blood products. We transfuse the blood products in following order: ECL – plasma – ECL – plasma – plasma. After transfusion of each unit, vital signs are reevaluated if further transfusion is needed.

TABLE 1: Hateful Eight: Clinical signs of exsanguination

The 'Hateful Eight': Clinical signs of exsanguination
1. Pallor
2. Diaphoresis
3. Air hunger
4. Venous collapse – difficult to cannulate
5. Low or unrecordable blood pressure
6. Low/falling $EtCO_2$
7. Abnormal sensorium (agitation, apathy, confusion, ...)
8. Brady- or tachycardia

Admission and Registration

Patients who receive prehospital blood products are transferred to a major trauma center. We pre-alert the receiving hospital in ATMIST style including transfused products and volume, IV access, ongoing hemorrhage or not and ask for activating the major hemorrhage protocol.

After the intervention all important information is collected and registered: patient characteristics (including medication, coagulation disorders, ...), trauma mechanism, vital signs at different timings, clinical findings, treatment, injuries, transfused volumes and lab results.

References

(1) Sperry JL et al. Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock. N Engl J Med 2018 ;379 :315-26 doi:10.1056/NEJMoa1802345

(2) Crombie N et al. Resuscitation with blood products in patients with trauma-related haemorrhagic shock receiving prehospital care (RePHILL) : a multicentre, open-label, randomised, controlled, phase 3 trial. Lancet Haematol 2022;9(4):e250-e260 doi:10.1016/ S2352-3026(22)00074-6

(3) Davies G. Trauma Care Webinars 23 nov 2022. Bleeding mimics, exsanguination and the hateful 8. https://www.youtube.com/watch?v=HCvTv_NTnEI

Volume-controlled mechanical ventilation during continuous chest compressions: An in vitro study on a CPR ventilation model

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Citation

Vanderstukken, J., Guldentop, J., Boef, M.d., Sabbe, M., Genbrugge, C., Stiers, M. Volume-controlled mechanical ventilation during continuous chest compressions: An in vitro study on a CPR ventilation model.

Introduction

Ventilation during cardiopulmonary resuscitation (CPR) is a critical step in enhancing survival rates and quality of life after cardiac arrest.(1) Most commonly, manual bag ventilation is used, which is operator dependent and could lead to hyperinflation and adverse hemodynamic effects. Mechanical ventilation during continuous chest compressions has the potential to provide a standardized and optimized ventilation method.(2) This bench study investigates the potential to use volume-controlled ventilation during CPR and secondarily to describe the respiratory parameters involved in a novel CPR compression model.

Methods

The bench setup consisted of a mechanical ventilator operated in a volume-controlled mode (ViX-ventilator, KU Leuven) and a lung simulator (ASL5000, IngMar Medical, USA). A CPR compression model was developed to replicate intrathoracic pressures during thoracic compressions, incorporating compressive and passive recoil phases with pressures of 16 cmH_2O and -4 cmH_2O, respectively, at a frequency of 100 compressions per minute. Clinically relevant ranges were defined for the volume-controlled ventilation parameters and lung compliance. Sampling of this multidimensional parameter space was done by Latin Hypercube Sampling (LHS, n=200), with each sample consisting of at least 35 mechanical ventilations.

Results

The LHS method achieved a good distribution across the clinically relevant range of the defined ventilation parameters. (Figure 1) The observational standard deviation for the outcome parameters Tidal Volume (VT) and Airway Pressures from these 200 measurements was clinically insignificant after 35 ventilations. A disparity in the distribution between the set VTs and the measured VTs was observed. Airway pressures exceeded the barotrauma threshold of 30 cmH_2O, particularly at low lung compliance and high set VTs. The set PEEP was maintained during the continuous compressions. The measured VT did not match the integral of the flow curve, resulting in a calculated higher cumulative volume. (Figure 2).

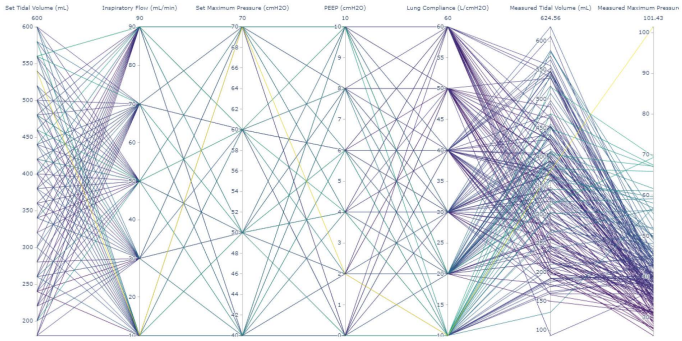

FIGURE 1

Parallel coordinates of defined ventilation and outcome parameters. Latin Hypercube Sampling ensures even distribution without clustering within the clinically relevant ranges of the set ventilation parameters (Tidal Volume, Inspiratory Flow, Maximum Pressure, and PEEP) and Lung Compliance. The outcome parameters, namely Measured Tidal Volume and Measured Maximum Airway Pressure, are plotted for each of the 200 measured configurations.

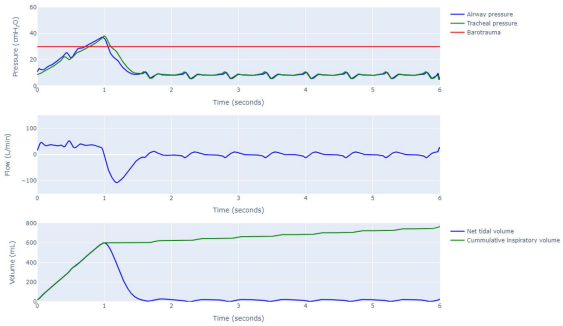

FIGURE 2

Ventilation profiles for a single cycle during synchronized Mechanical Ventilation in CPR. This figure plots the pressure, flow, and volume curves for volume-controlled ventilation with Tidal Volume: 580 mL, Inspiratory Flow: 10 L/min, Maximum Pressure: 60 cmH_2O, PEEP: 8 cmH_2O, and Lung Compliance: 20 mL/cmH_2O during continuous mechanical compressions. In the pressure curve, both airway and alveolar pressures are displayed, each exceeding the potential threshold for barotrauma (30 cmH_2O). The volume curve illustrates the Net Tidal Volume and cumulative inspiratory volume, calculated as the integral of the flow curve.

Discussion

The expected performance of volume-controlled ventilation, namely the delivery of a set tidal volume (VT), is not achieved during synchronous ventilation with continuous compressions. Contributing factors include reduced lung compliance during cardiac arrest and the intrathoracic counterpressure's generated by compressions, which can lead to high tracheal pressures and potential barotrauma. Additionally, targeting VT during CPR ventilation is challenging due to discrepancies between measured VT and the cumulative inspiratory volume. Current guidelines have translated general principles from routine mechanical ventilation to ventilation during cardiac arrest (CA), a fundamentally different clinical scenario.(3) This in vitro model allows for precise adjustments of ventilator settings and close monitoring of their effects on ventilation and respiratory parameters. Further development of the database and a sensitivity analysis (Sobol) will provide additional insights, as well as testing a pressure-controlled ventilation mode. (4) The developed CPR compression simulation model offers a pioneering approach for bench research on ventilation during active CPR using a high-end lung simulator, eliminating the need to rely on difficult-to-control manikin studies or cadaver studies. Measuring respiratory mechanics is the first step, influencing them with new ventilation methods is the logical next. This innovative in vitro model paves the way for research and development of a specific ventilation mode tailored for cardiac arrest.

References

(1) Marijon E, Narayanan K, Smith K, Barra S, Basso C, Blom MT, et al. Commission to reduce the global burden of sudden cardiac death: a call for multidisciplinary action. The Lancet. 2023;402(10405):883-936.

(2) Orlob S, Wittig J, Hobisch C, Auinger D, Honnef G, Fellinger T, et al. Reliability of mechanical ventilation during continuous chest compressions: a crossover study of transport ventilators in a human cadaver model of CPR. Scand J Trauma Resusc Emerg Med. 2021;29(1):102.

(3) Berg KM, Ng K-C, Liley HG, Greif R, Carlson JN, Morley PT, et al. 2023 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation, and Teams; and First Aid Task Forces. Resuscitation. 2024;195:109992-.

(4) Malinverni S, Wilmin S, de Longueville D, Sarnelli M, Vermeulen G, Kaabour M, et al. A retrospective comparison of mechanical cardio-pulmonary ventilation and manual bag valve ventilation in non-traumatic out-of-hospital cardiac arrests: A study from the Belgian cardiac arrest registry. Resuscitation. 2024:110203.

Differentiation of transfusion profiles following implementation of a goal-directed transfusion protocol in major trauma: A monocentric retrospective analysis

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Citation

Mieghem C.V., Janssens, E., Schnaubelt, S., Verdonck, P. Differentiation of transfusion profiles following implementation of a goal-directed transfusion protocol in major trauma: A monocentric retrospective analysis.

Introduction

Trauma-induced coagulopathy (TIC) significantly contributes to mortality in major trauma (1, 2). Diagnosis can rely on conventional coagulation tests or point-of-care (POC) viscoelastic hemostatic assays (VHA) like POC rotational thrombo-elastometry (ROTEM), allowing for early and goal-directed correction of TIC during primary survey as opposed to the standard 1:1:1 transfusion ratio. Previous studies have reported reduced overall mortality and reduced use of FFP and thrombocyte concentrate with goal-directed transfusion strategies (3, 4). Despite this apparent benefit, a pragmatic 1:1:1 transfusion strategy remains a requirement for patients too unstable to sample or to await ROTEM results for targeted correction. This study aims to observe the differences in patient characteristics and outcomes between patient groups, based on different transfusion strategies since implementation of a goal-directed transfusion protocol in a level-1 trauma center.

Methods

This retrospective, monocentric study examines transfusion strategies developed following the introduction of ROTEM as a part of the primary survey in the Antwerp University Hospital late 2017. Trauma patients with transfusion requirement during primary survey presenting from January 2018 to December 2023 were categorized based on the transfusion strategy: packed cells only (PC-O), packed cells and fresh frozen plasma (PC-FFP), packed cells and factor concentrate [Cofact® and/or Riastap®] (PC-FC), or packed cells, FFP, and FC (PC-FFP-FC). These regimens were compared for demographic, biochemical and coagulation differences at admission and differences in the incidence of TIC at 24h and 72h, mortality and thrombotic complications. TIC was defined by an INR >1.2, EXTEM-A10 <40s or FIBTEM-A10 <9mm. Analysis was performed with Kruskal-Wallis analysis of variance and chi-square testing through IBM SPSS Statistics version 29.0.1.0.

Results

We included 243 patients and allocated them to a transfusion regimen group based on transfusion strategy during primary survey: PC-O (N=105), PC-

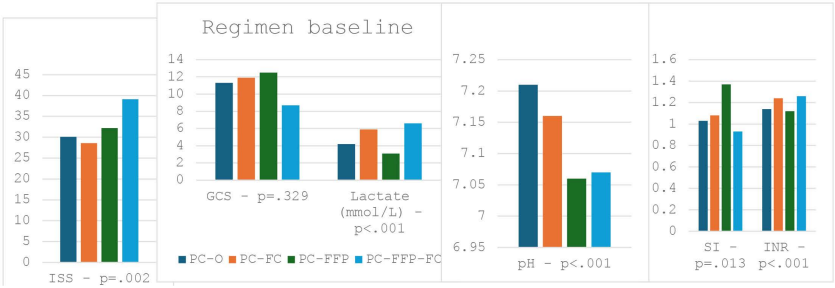

FIGURE 1
Patient characteristics.

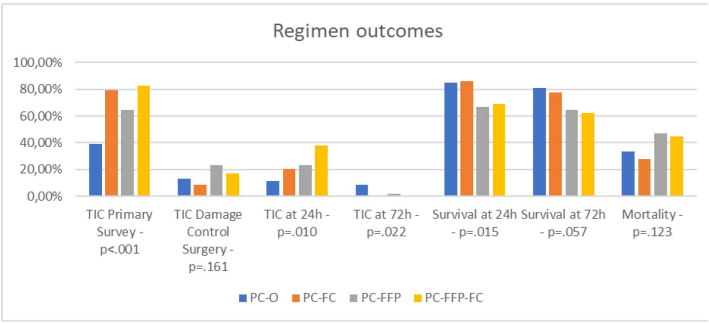

FIGURE 2
Outcome measures for different subgroups in % of total.

FFP (N=51), PC-FC (N=58) and PC-FFP-FC (N=29). Patient characteristics demonstrated a higher Injury Severity Score (ISS) for the PC-FFP (median 28.0±14.4, p<.001) and PC-FFP-FC (median 34.0±13.1, p=.009) groups, as well as a higher shock index (SI) in the PC-FFP group (median 1.37±.53, p=.013). PC-FFP and PC-FFP-FC transfused groups demonstrated higher heart rate, acidosis, hypofibrinogenemia, and lower base excess Fig 1. PC-FC and PC-FFP-FC groups demonstrated more ROTEM-diagnosed TIC. The PC-O group demonstrated lower packed cells transfusion compared to all other groups

(mean 2.5±1.3U, PC-FFP 5.6±2.8, PC-FC 4.6±3.3U and PC-FFP-FC 5.8±2.7U, p<.001) and fewer platelet transfusions than FFP-transfused groups (0.0±.0U, PC-FFP 0.4±.5U, PC-FFP-FC 0.2±0.4U, p<.001) during the primary survey, as well as for cumulative transfusion at 72h of admission. Lower survival rates at 24h were observed in the PC-FFP and PC-FFP-FC groups compared to the other groups (66.7% and 69.0%, respectively, versus 84.8% and 86.2% p=.015), without significance to overall mortality (p=.123) Fig 2.

Discussion

Implementation of goal-directed transfusion in major trauma led to a pragmatic application of different transfusion regimens, appearing associated with distinct clinical and metabolic profiles. The PC-O group demonstrated less injured, more stable patients with lower transfusion requirements than all other groups. The PC-FFP and PC-FFP-FC groups exhibit more severely injured patients with higher degree of shock and metabolic dysfunction, as well as reduced early survival despite goal-directed transfusion. PC-FFP-FC and PC-FC groups both demonstrate more coagulopathic ROTEM screening, although the latter proved more stable and less injured than the first. We propose goal-directed transfusion can offer product correction tailored to clinical and coagulation requirements of different patient profiles, as opposed to a one-size-fits all 1:1:1 transfusion strategy.

References

(1) Moore EE, Moore HB, Kornblith LZ, Neal MD, Hoffman M, Mutch NJ, et al. Trauma-induced coagulopathy. Nat Rev Dis Primers. 2021;7(1):30.

(2) Moore HB, Moore EE, Gonzalez E, Chapman MP, Chin TL, Silliman CC, et al. Hyperfibrinolysis, physiologic fibrinolysis, and fibrinolysis shutdown: the spectrum of postinjury fibrinolysis and relevance to antifibrinolytic therapy. J Trauma Acute Care Surg. 2014;77(6):811-7; discussion 7.

(3) Gonzalez E, Moore EE, Moore HB, Chapman MP, Chin TL, Ghasabyan A, et al. Goal-directed Hemostatic Resuscitation of Trauma-induced Coagulopathy: A Pragmatic Randomized Clinical Trial Comparing a Viscoelastic Assay to Conventional Coagulation Assays. Ann Surg. 2016;263(6):1051-9.

(4) Gonzalez E, Moore EE, Moore HB. Management of Trauma-Induced Coagulopathy with Thrombelastography. Crit Care Clin. 2017;33(1):119-34.

Impact of implementing a goal-directed transfusion protocol on transfusion and coagulation management in major trauma: A monocentric retrospective analysis

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Citation

Mieghem, C.V., Janssens, E., Schnaubelt, S., Verdonck, P. Impact of implementing a goal-directed transfusion protocol on transfusion and coagulation management in major trauma: A monocentric retrospective analysis.

Introduction

Trauma-induced coagulopathy (TIC) significantly contributes to mortality in major trauma (1, 2). The diagnosis of TIC can rely on conventional coagulation tests or on viscoelastic hemostatic assays (VHA) and has an estimated incidence of 25% in major trauma. Implementation of point-of-care (POC) rotational thromboelastometry (ROTEM) during primary survey in major trauma allows goal-directed transfusion of allogeneic blood products or coagulation factors (factor complex concentrate (FCC) or fibrinogen concentrate (FC)), moving away from a standard 1:1:1 ratio of packed cells (PC) to fresh frozen plasma (FFP) to platelets (PLT) (3, 4, 5). This study aims to observe changes in transfusion strategies and coagulation management since implementing a goal-directed transfusion protocol in a major trauma center.

Methods

This retrospective monocentric study observes the effects of implementing POC ROTEM on transfusion practice, biochemical results, coagulation tests, and clinical outcomes in the Antwerp University Hospital. The analysis includes trauma patients who received allogeneic blood products during primary survey. Patients with prehospital arrest without ROSC, FCC-only transfusion, age below 16 years, and anticoagulation use were excluded. Patient characteristics, transfusion ratios, biochemical results, and coagulation profiles were analyzed before and after ROTEM implementation (January 2016 to December 2017, pre-ROTEM; and January 2018 to December 2023, post-ROTEM). Clinical outcomes assessed include the incidence of TIC on admission and during damage control surgery (DCS), 24 hours and 72 hours post-admission, as well as mortality and thrombotic events during admission. TIC was defined by an INR >1.2, EXTEM-A10 <40s or FIBTEM-A10 <9mm. Analysis was performed with Kruskal-Wallis analysis of variance and chi-square testing through IBM SPSS Statistics version 29.0.1.0.

Results

We included 300 patients: 63 in the pre-ROTEM and 237 in the post-ROTEM cohort. Patients in the post-ROTEM group had a higher injury severity

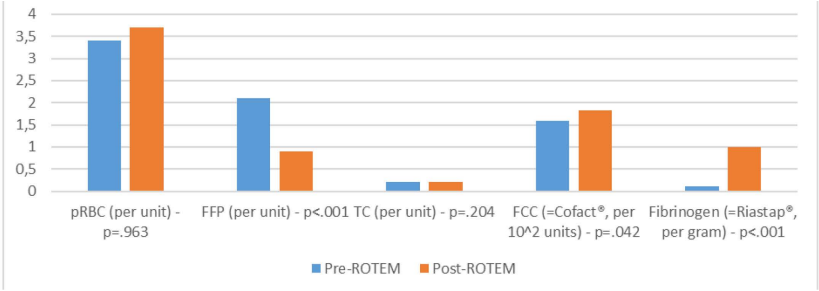

FIGURE 1
Transfusion regimens before and after implementation of ROTEM during primary survey.

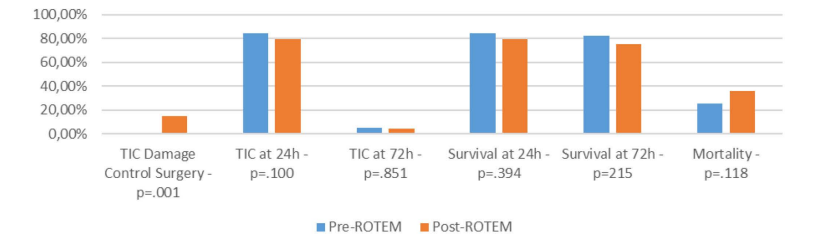

FIGURE 2
Outcomes before and after implementation of ROTEM during primary survey.

score (ISS; median ISS 27.0±12.4 versus 34.0±16.3, p<.001) compared to the pre-ROTEM group, but no significant difference in shock index during primary survey was observed. The incidence of TIC on admission increased post-ROTEM implementation (31.7% versus 59.1%, p<.001) along with an increase in ROTEM sampling (3.2% versus 39.7%, p<.001). TIC as per INR remained similar (31.7% versus 39.7%, p=.250). Other patient characteristics and baseline data did not demonstrate a significant difference between both

groups (age, gender, BMI, mechanism of injury, abbreviated injury score, GCS and GCS-M scores). Analysis showed a reduction in FFP usage (mean 2.1±2.2U versus 0.9±1.5U, p<.001), an increase in FCC administration (mean 159±861U versus 182±489U, p=.042) and an increase in administration of FC (mean 0.1±0.7g versus 1.0±1.7g, p<.001) post-ROTEM implementation Fig 1. These differences remained significant cumulatively during DCS and the initial 72 hours of admission. Transfusion of PC and PLT did not differ significantly. There were no significant differences in TIC incidence at 24 and 72 hours, nor in mortality or in the incidence of thrombotic events Fig 2.

Discussion

Overall, this study observed a shift towards FFP-sparing transfusion after implementation of goal-guided transfusion. This decrease in need for allogeneic transfusion products during primary survey was not compensated later in the admission and did not demonstrate significant impact on mortality, TIC, or thrombotic complications.

References

(1) Moore EE, Moore HB, Kornblith LZ, Neal MD, Hoffman M, Mutch NJ, et al. Trauma-induced coagulopathy. Nat Rev Dis Primers. 2021;7(1):30.

(2) Moore HB, Moore EE, Gonzalez E, Chapman MP, Chin TL, Silliman CC, et al. Hyperfibrinolysis, physiologic fibrinolysis, and fibrinolysis shutdown: the spectrum of postinjury fibrinolysis and relevance to antifibrinolytic therapy. J Trauma Acute Care Surg. 2014;77(6):811-7; discussion 7.

(3) Sankarankutty A, Nascimento B, Teodoro da Luz L, Rizoli S. TEG® and ROTEM® in trauma: similar test but different results? World J Emerg Surg. 2012;7 Suppl 1(Suppl 1):S3.

(4) Gonzalez E, Moore EE, Moore HB, Chapman MP, Chin TL, Ghasabyan A, et al. Goal-directed Hemostatic Resuscitation of Trauma-induced Coagulopathy: A Pragmatic Randomized Clinical Trial Comparing a Viscoelastic Assay to Conventional Coagulation Assays. Ann Surg. 2016;263(6):1051-9.

(5) Gonzalez E, Moore EE, Moore HB. Management of Trauma-Induced Coagulopathy with Thrombelastography. Crit Care Clin. 2017;33(1):119-34.

Telemonitoring-based discharge from the ED for COVID-19 patients: Can we do it safely?

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Citation
Katrien, V., Merel, V.P., Brecht, D.T., Peter, D.P., Lyphout, C. Telemonitoring-based discharge from the ED for COVID-19 patients: Can we do it safely?

Introduction

Because of the challenges posed by the COVID-19 pandemic, telemonitoring was suggested as a possible resource to reduce the number of hospitalisations, monitor patients at home and reduce exposure of health personnel to the virus.

Methods

This study aims to assess the safety profile and feasibility of the 'CovidCare@Home' system. Patients who presented to the emergency department (ED) with symptoms due to COVID-19 were evaluated based on clinical presentation and risk factors for deterioration. A protocol was established as a guideline for possible discharge (with or without telemonitoring) or hospitalisation Fig 1. This protocol was based on the available resources on COVID-19, it's presentation and the associated risk factors at that time (1-2).

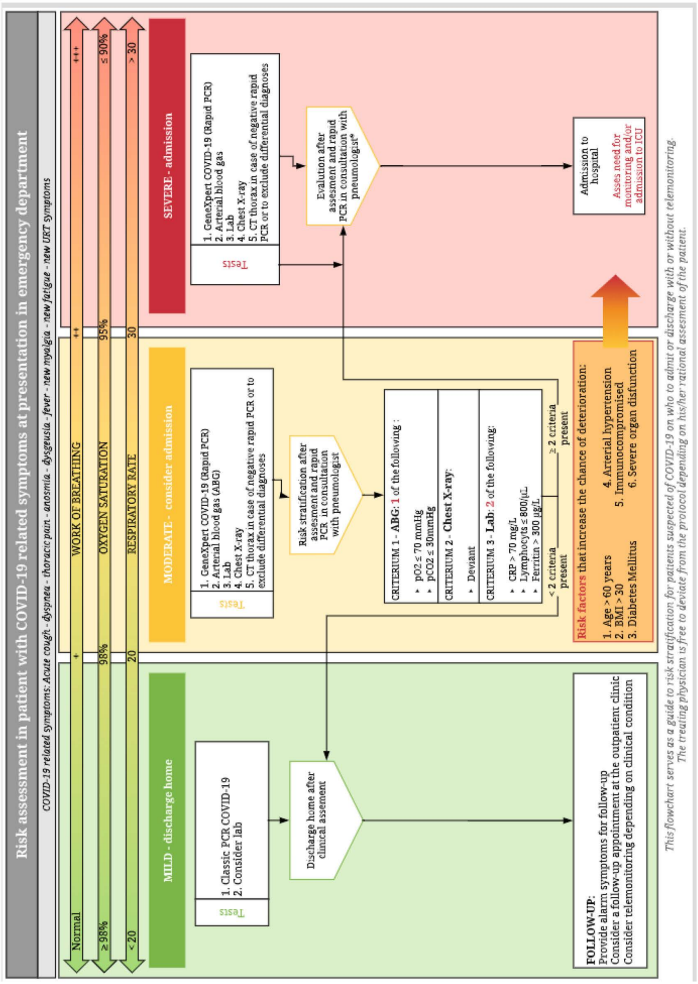

FIGURE 1
Enrolment protocol telemonitoring.

TABLE 1: Alarm settings in the CovidCare@Home application

	Red	Orange		Orange	Red
Respiration Rate /min			∞ - 20]	(20 - 25)	[25 - ∞
Oxygen Saturation (hospital 1)	∞ - 95]	(95 – 98)	[98 - ∞		
Oxygen Saturation (hospital 2)	∞ - 91]	(91 – 93)	[93 - ∞		
Heart Rate (1st measurement)	∞ - 40]	(40 – 51)	[51 – 90]	(90 – 130)	[130 - ∞
Heart Rate (2nd measurement)	∞ - 40]	(40 – 51)	[51 – 110]	(110 – 130)	[130 - ∞
Temperature		∞ - 35)	[35 – 39]	[39 - ∞	

The telemonitoring system allowed for follow-up on vital signs (oxygen saturation, heart rate, respiratory rate and temperature) through a smartphone application. This was linked to two types of alarms (orange: submit extra vital signs after 1 hour; red: contact medical staff immediately) Table 1. A satisfaction survey was executed after termination of the telemonitoring period.

Results

We included 52 patients. Practitioners did not strictly follow the protocol, as clinical gestalt was also taken into account. Median follow-up was 6 days. Hospitalisation rate was 38%, 10% were admitted to ICU but none of them immediately at the time of re-presentation. No deaths were reported. There were two safety events with low oxygen saturation upon re-presentation. No readmissions occurred after 7 days. 518 alarms were registered (60% orange, 40% red). The patients who were hospitalised showed significantly more alarms for heart rate and oxygen saturation levels (P= 0.007 for both). Only 12,5% of the patients who received alarms responded correctly to all alarms. Patient satisfaction was found to be high.

Discussion

Results suggest that this telemonitoring system can be considered safe. Similar results were found by other ED-based telemonitoring studies (3-5). However, the responsibility should not entirely be put on the patients due to low adherence rate and alarm fatigue. Pro-active follow-up was found necessary. Telemonitoring allowed for a larger subset of our population to safely stay at home, leading to reduced hospital occupancy and thus costs. Liberal inclusion based on clinical gestalt proved useful, since clinical evolution could not entirely be predicted by the protocol. Patient registration of respiratory rates was difficult using this tool. Several implementation issues arose such as protocol breaches based on individual clinical assessment by the physician. Many alarms were contributed by a high respiratory rate, possibly due to incorrect measurements by the patients.

Conclusion

The results of this feasibility study are promising for telemonitoring COVID-19 patients after presentation to the ED. It appears to be safe and may reduce hospitalisations and length of stay. Protocol-based inclusion should leave flexibility for clinical gestalt and pro-active followup is recommended due to alarm fatigue. Logistic support is needed when implementing telemonitoring on a large scale.

References

(1) Gidari A, De Socio GV, Sabbatini S, Francisci D. Predictive value of National Early Warning Score 2 (NEWS2) for intensive care unit admission in patients with SARS-CoV-2 infection. Infectious diseases (London, England). 2020;52(10):698-704.

(2) Kostakis I, Smith GB, Prytherch D, Meredith P, Price C, Chauhan A. The performance of the National Early Warning Score and National Early Warning Score 2 in hospitalised patients infected by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Resuscitation. 2021;159:150-7.

(3) Khalid I, Imran M, Imran M, Khan S, Akhtar MA, Amanullah K, Khalid TJ. Telemedicine monitoring of high-risk coronavirus disease 2019 (COVID-19) patients by family medicine service after discharge from the emergency department. J Family Community Med. 2021;28(3):210-6.

(4) Shah S, Majmudar K, Stein A, Gupta N, Suppes S, Karamanis M, et al. Novel Use of Home Pulse Oximetry Monitoring in COVID-19 Patients Discharged From the Emergency Department Identifies Need for Hospitalization. Acad Emerg Med. 2020;27(8):681-92.

(5) Gootenberg DB, Kurtzman N, O'Mara T, Ge JY, Chiu D, Shapiro NI, et al. Developing a pulse oximetry home monitoring protocol for patients suspected with COVID-19 after emergency department discharge. BMJ Health Care Inform. 2021;28(1)

Atraumatic splenic rupture in an infant

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Citation
Vanschoenbeek, G., Vermeulen, K., Maris, E., Damen, J. Atraumatic splenic rupture in an infant.

Introduction

Atraumatic splenic rupture is a rare occurrence with a reported frequency of less than 1% of total splenic ruptures[1]. The most common causes are underlying hematologic conditions and infectious diseases. The classic clinical presentation with acute left upper quadrant abdominal pain however is difficult to discern in the preverbal child and can mimic other more frequent clinical syndromes such as sepsis in this population. We present a child with a spontaneous splenic rupture and a recent history of cytomegalovirus (CMV) infection.

Case Report

A 14-month-old girl presented to the emergency department (ED) with grunting and a distended abdomen. The mother reported no problems when dropping off the child at daycare in the morning, but was alerted by the daycare staff because of refusal to eat and presumed difficulty breathing. The child was reported to have had a serologically confirmed CMV infection some weeks prior to the ED presentation.

On clinical examination the child appeared pale, painful and in respiratory and circulatory distress. She was tachypneic and grunting with an oxygen saturation of 100% on room air. She was tachycardic at 190 beats per minute with an increased capillary refill of 4 to 5 seconds. The abdomen was distended and palpation seemed painful but there were no signs of trauma. Temperature was 38°C and body weight was 10.0 kg.

An intravenous (IV) line was placed and a single dose of ceftriaxone was given for presumed sepsis, along with IV paracetamol for analgesia and crystalloids for fluid resuscitation. Venous blood gas revealed acidosis, elevated lactate and a negative base excess. Because of the shock state, a RUSH protocol (Rapid Ultrasound in Shock and Hypotension) was performed at the bedside. This revealed abdominal free fluid. An urgent abdominal CT was performed which showed a grade 4 splenic rupture with an active blush. With initial resuscitation efforts clinical and biochemical hemodynamic parameters stabilized. An IV bolus of tranexamic acid was administered. The child was subsequently transferred to a tertiary care center where additional imaging revealed a pseudoaneurysm which was coiled by interventional radiology. Afterwards the child remained stable and was discharged one week later making a full recovery.

Conclusion

Atraumatic splenic rupture is a rare occurrence and the initial presentation in the preverbal child will be nonspecific, mimicking more frequent disease states such as sepsis. Resuscitation of children presenting in shock states should be performed according to European Resuscitation Council guidelines. However, the use of bedside ultrasound can guide the initial management and differential diagnosis, accelerating workup and disposition of these patients. Timely discussion of these patients with a tertiary care center that has both an interventional radiology department and a pediatric intensive care unit is also crucial in an effort to preserve the spleen, as non-operative management with close observation and embolization both carry a significantly shorter length of stay and a lower mortality rate than splenectomy[2-4].

References

[1] Bakkali I, Bigiku M, Cela D et al. Atraumatic splenic rupture in a child with COVID 19. BMC Pediatric 2022; 22:300.

[2] Shinn K, Gilyard S, Chahine A et al. Contemporary management of pediatric blunt splenic trauma: a national trauma databank analysis. Journal of Vascular and Interventional Radiology 2021;32(5):692-702.

[3] Grootenhaar M, Lamers D, Kamphuis-van Ulzen K et al. The management and outcome of paediatric splenic injuries In the Netherlands. World Journal of Emergency Surgery 2021; 16(8).

[4] Lynn K, Werder G, Callaghan R et al. Pediatric blunt splenic trauma: a comprehensive review. Pediatric Radiology 2009;39(9):904-16.

Behavioral changes and aggression in young male in the emergency department – It's not always drugs

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Citation
Six, N., Hubloue, I. Behavioral changes and aggression in young male in the emergency department – It's not always drugs.

Introduction

When young people present in the Emergency Department (ED) with behavioral changes, confusion and episodes of aggression, we are often quick to jump to conclusions and go down the road of psychiatric differential diagnoses and/or drug abuse. We report a case presenting to our ED showing the relevance of a profound mental and behavioral examination in patients with an "atypical" clinical presentation and a normal head CT-scan.

Case Report

A 34 year old male presented at our ED with behavioral changes, confusion, headache and aggressive behavior. Furthermore the patient has been experiencing vertigo, nausea, fatigue and is seeing black spots. In his medical history we only note migraines and mild case of bilateral otitis media. No medical history of mental illness or drug abuse. The patient is a pilot by profession. Initially the patient was categorized as non-urgent with suspicion of drug abuse and a psychiatric consult was ordered.

Upon physical examination the patient is rather bradyphrenic with word finding disorder. He also exhibits instable gait. The patient is not oriented in time. The facial lines were symmetrical, the tongue was extended centrally, the muscle strength and tone of the limbs was normal, and bilateral Babinski syndrome was negative. The neck was soft and Kernig syndrome negative. In supine position we note a nystagmus to the left. We also note a hearing loss in de the right ear. There was no abnormality in cardiopulmonary auscultation.

Initial labs show no abnormalities. ECG does not show any abnormalities. Lumbar puncture shows results within normal limits.

A non-contrast head CT showed nothing remarkable. Urgent magnetic resonance imaging (MRI) shows multiple hyperintense white matter lesions

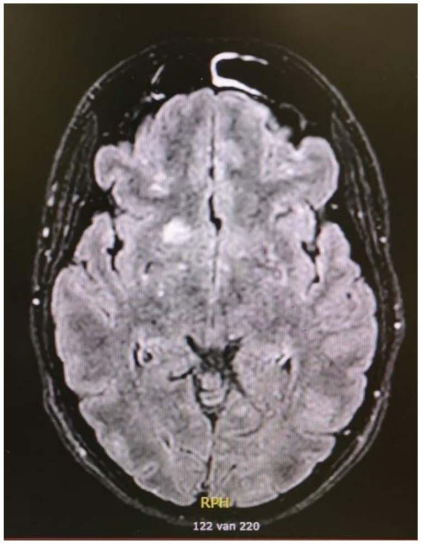

FIGURE 1
Brain magnetic resonance imaging (MRI) with coronal FLAIR illustrating snowball lesions.

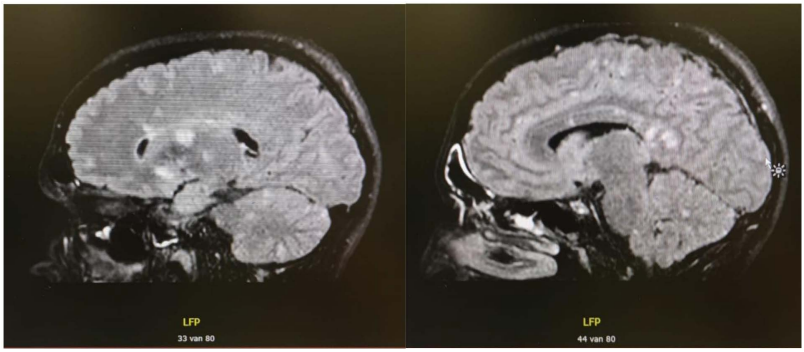

FIGURE 2
Brain magnetic resonance imaging (MRI) with sagittal FLAIR illustrating snowball lesions.

on fluid-attenuated inversion-recovery (FLAIR) sequence, located supra- and infratentorial in the corpus callosum, also known as 'snowball lesions', as seen in fig. 1 and 2 [3].

Based on the clinical presentation and the MRI-findings the diagnosis of Susac syndrome was forwarde.

Conclusion

Susac's syndrome is a rare auto-immune endotheliopathy leading to a characteristic clinical triad of encefalopathy, retinal vaso-occlusive disease and sensorineural hearing impairment [1,2]. Diagnosis is based on the clinical presentation, brain magnetic resonance imaging, retinal fluorescein angiography, and audiometry [1]. Because it is a rare disease with variable presentation, Susac syndrome is often missed and remains underdiagnosed. Therefore treatment is usually started late, which can lead to sequelae such as dementia, blindness and permanent hearing loss [2].

As already pointed out a take home message from this case is the importance of a profound mental and behavioral examination in patients with an "atypical" clinical presentation and a normal head CT-scan.

References

[1] Pereira S, Vieira B, Maio T, Moreira J, Sampaio F. Susac's Syndrome: An Updated Review. Neuroophthalmology. 2020 May 1;44(6):355-360. doi: 10.1080/01658107.2020.1748062. PMID: 33408428; PMCID: PMC7746245.

[2] Marrodan M, Fiol MP, Correale J. Susac syndrome: challenges in the diagnosis and treatment. Brain. 2022 Apr 29;145(3):858-871. doi: 10.1093/brain/awab476. PMID: 35136969.

[3] Dierickx, J., Vanhoenacker, F. and Merckaert, V., 2021. Snowballs and Icicles in Susac's Syndrome. Journal of the Belgian Society of Radiology, 105(1), p.24.DOI: https://doi.org/10.5334/jbsr.2441

Unusual admission rates at the emergency room during the post-peak COVID-19 period (under-study)

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Citation

Vlaenderen, M.V., Himschoot, W., Desmet, T., Paepe, P.D. Unusual admission rates at the emergency room during the post-peak covid-19 period (under-study).

Objective

Subsequent to the third wave of COVID-19 in Belgium (February 15, 2021 – July 10, 2021), when all COVID-19 restrictions were lifted, there was a prevailing observation of a notable uptick in the number of patients seeking care at emergency departments (ED). Moreover, there appeared to be an increase in patients presenting with conditions of lower severity. The primary aim of this study was to quantitively assess the abrupt rise in emergency department visits following the third COVID-19 wave and objectify whether there was a concurrent increase in the presentation of low-severity illnesses.

Methods

A retrospective cross-sectional analysis compared two populations: patients attending the ED from September 1 to December 31, 2019 (group 1) and from September 1 to December 31, 2021 (Group 2). Data from medical records, the modified Manchester triage system, and administrative software were used to analyze demographic features and disease severity. Statistical analyses involved Chi-square tests for categorical data and Mann–Whitney U tests for continuous variables, using IBM SPSS Statistics and GraphPad Prism.

Results

The study found a 15% increase in ED visits in the latter part of 2021 compared to the same period in 2019 (11,840 vs. 13,675 patients). Demographically, no significant differences were observed between the two groups (group 1: $\bar{x}$ = 40,56; s= 23,681; R= 98; IQR=37; CI (95%)= (40,13; 40.98); group 2: $\bar{x}$ = 40,56; s= 23,767; R= 99; IQR=37; CI (95%)= (40,16; 40.96)). There was a significant increase in the number of patients presenting with both the most emergent and least emergent conditions (0,4%; $p = 0.003$ and 5,5%; $p < 0.001$ respectively). Hospitalization rates decreased significantly from 38.1% in 2019 to 36.2% in 2021 ($p < 0.001$). With regard to the types of pathologies, a notable rise in respiratory complaints was observed (5.4% vs. 7.3%; $p < 0.001$). Referral rates remained relatively stable (23,3% in 2019 vs. 22,9% in 2021; $p = 0.524$) despite the increase in patient volume. There was no significant difference between the two groups regarding the time of presentation at the ED.

Discussion

The increase in ED visits following the third COVID-19 wave can be attributed to a resurgence of both less urgent and more urgent pathologies [1-3]. The effects of the pandemic may have influenced patient behavior, leading to delays in seeking healthcare and consequently, a significant increase in the most emergent pathologies [4-5]. Simultaneously, the notable rise in less urgent pathologies, along with increased referrals for these cases, suggests a heightened strain on primary healthcare services after the COVID-19 peak period. Additionally, the decrease in hospitalization rates may be linked to

the surge in less urgent pathologies. Another plausible explanation for this is the implementation of more stringent admission criteria, prompted by reduced hospitalization capacity due to nursing staff shortages. This study underscores the need for systemic optimalization of patient flow to address emergency department crowding, including strategies to manage non-urgent care demands and optimize referral practices.

References

[1] Murphy AW. "Inappropriate" attenders at accident and emergency departments I: definition, incidence and reasons for attendance. Fam Pract [Internet]. 1998 Feb [cited 2024 Feb 28];15(1):23–32. Available from: https://pubmed.ncbi.nlm.nih.gov/9527294/

[2] Martin B, Kaminski-Ozturk N, O'Hara C, Smiley R. Examining the Impact of the COVID-19 Pandemic on Burnout and Stress Among U.S. Nurses. J Nurs Regul [Internet]. 2023 Apr 1 [cited 2024 Feb 28];14(1):4. Available from: /pmc/articles/PMC10074070/

[3] Hartnett KP, Kite-Powell A, DeVies J, Coletta MA, Boehmer TK, Adjemian J, et al. Impact of the COVID-19 Pandemic on Emergency Department Visits — United States, January 1, 2019–May 30, 2020. MMWR Morb Mortal Wkly Rep. 2020 Jun 12;69(23):699–704.

[4] Richardson DB. Increase in patient mortality at 10days associated with emergency department overcrowding. Medical Journal of Australia [Internet]. 2006 Mar 1 [cited 2024 Feb 28];184(5):213–6. Available from: https://onlinelibrary.wiley.com/doi/full/10.5694/j.1326 5377.2006.tb00204.x

[5] Lindner G, Woitok BK. Emergency department overcrowding : Analysis and strategies to manage an international phenomenon. Wien Klin Wochenschr [Internet]. 2021 Mar 1 [cited 2024 Feb 28];133(5–6):229–33. Available from: https://pubmed.ncbi.nlm.nih.gov/31932966/

Timing of initiation of empirical antibiotic therapy in patients with suspected sepsis admitted to the ICU

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Ben, V., Stoffel, L. Timing of initiation of empirical antibiotic therapy in patients with suspected sepsis admitted to the ICU.

Introduction

Antibiotics are a cornerstone of the management in patients with sepsis. The 2021 update of the Surviving Sepsis campaign suggests that antibiotics should be administered within 1 hour and 3 hours of recognition of septic shock and sepsis, respectively.(1) However, we should not only focus on how to reduce the administration delay (time between recognition of sepsis and administration of antibiotics). We should also minimize the recognition delay (the time between arrival and antibiotic order).

Methods/Setting

This study evaluated the time delay of antibiotic initiation in patients with suspected sepsis admitted from the Emergency Department (ED) to the ICU

and assessed whether clinical practice in our center is in line with current guidelines.

This is a single-center, prospective, observational study during a 5-month period (April – August '23) in which all patients admitted from ED admitted to ICU with suspected sepsis were screened for inclusion. Exclusion criteria were patients with (1) pre-hospital antibiotic initiation, (2) COVID-19 infection, (3) surgery prior to ICU admission, (4) unavailable qSOFA data and (5) retrospectively no infection warranting antibiotics. Subgroups were sepsis versus septic shock and qSOFA <2 versus qSOFA ≥2 upon admission at ED. The primary outcome measure was the total antibiotic delay, further subdivided into recognition delay (the interval from triage to antibiotic prescription) and administration delay (the interval between prescription and actual antibiotic administration) Fig 1. Descriptive statistics were used for a comprehensive analysis using IBM SPSS Statistics 29.0.0.0.

Results

This study involved 45 patients. Just under half of them (47%) were diagnosed with septic shock. The overall median total delay for the entire cohort was 2h03 [1h04,3h11], with a breakdown of 1h38 [0h44,2h41] for recognition delay and 7 minutes [1min,40min] for administration delay Fig 2.

Comparing 'the septic shock' (n=21) with 'the sepsis without shock' (n=24) group, a slightly shorter interval was observed for all delays in patients with shock: total delay of 1h54 [1h03,3h12] vs 2h13[1h03,3h03] (p=0.93), recognition delay of 1h25 [0h37,2h15] vs 1h37 [0h54,2h41] (p=0.85) and administration delay (0h06 [0h01,00H45] vs 0h10 [0h01,0H47] (p=0.85)).) However, all these differences were not statistically significant, as indicated by p-values (Mann-Whitney U test).

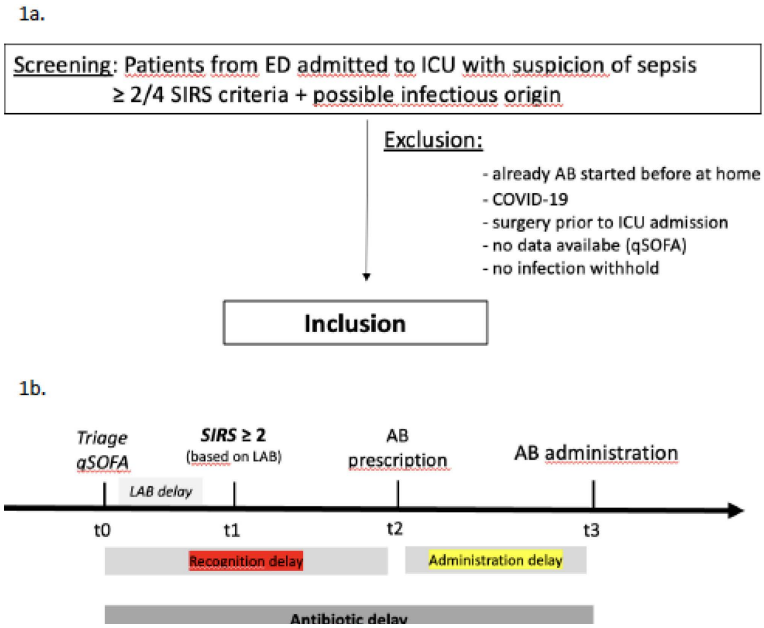

FIGURE 1
Study Flow. 1a Screening process. 1b Different time intervals: total antibiotic delay, recognition delay and administration delay.

Similarly, no significant differences were found when comparing the qSOFA-score < 2 cohort (n=33) to the qSOFA of ≥2 cohort (n=12). The median total delay was 2h10 [1h12,3h13] vs 1h50 [0h42,3h01] (p= 0.35), recognition delay was 1h38 [0h52,2h46] vs 1h30 [0h23,2h23] (p = 0.52), and administration delay was 7 [0h01,0h51] vs 6 minutes [0h01,0h27] (p = 0.99), respectively.

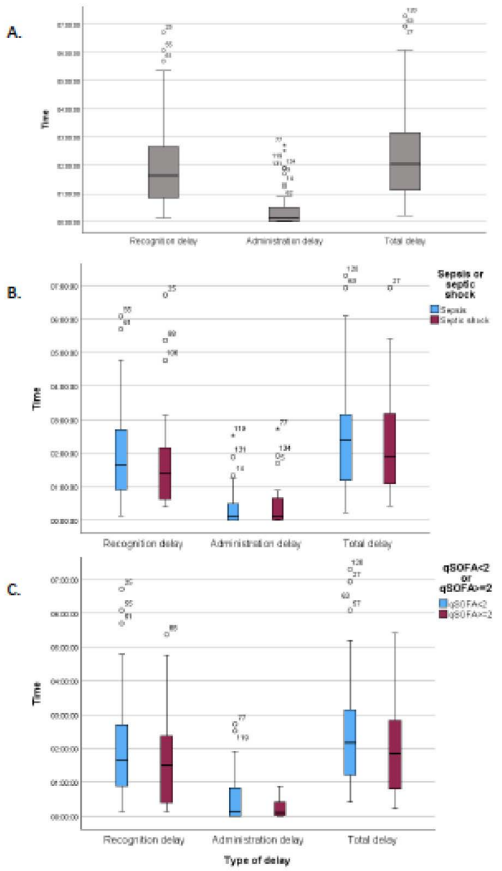

FIGURE 2

Timing of antibiotic initiation in patients with suspected sepsis admitted from ED to ICU. Different types of delay were depicted using boxplots. A. Overall cohort; B. Subgroups Sepsis without shock versus Septic Shock; C. Subgroups qSOFA-score < 2 versus qSOFA of ≥2.

Discussion

This study demonstrates alignment with current recommendations for both sepsis and septic shock cases in terms of timely antibiotic initiation. Notably, the administration delay constitutes only a fraction of the total delay. Future endeavors in quality improvement should prioritize addressing recognition delay, especially for the more critically ill patients, such as those presenting with septic shock or a qSOFA score of ≥2 at admission.

Reference

(1) Evans L, Rhodes A, Alhazzani W, Antonelli M, Coopersmith CM, French C, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. Intensive Care Med. 2021;47(11):1181-247.

The challenges of providing care for migrant patients in Belgian emergency services: A first insight of the intercultural competencies of ER physicians

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Citation
Vincent, A., Yılmaz, E., Thys, F. The challenges of providing care for migrant patients in Belgian emergency services: A first insight of the intercultural competencies of ER physicians.

Introduction

Increasing diversity in Belgium[1] renders it important to understand the challenges faced in the ER with migrant patients. Culture has been shown to influence patients' ways of feeling and communicating their symptoms[2]. To our knowledge, no previous studies have been conducted within the Belgian context on culture-specific challenges ER physicians face when providing care to migrant patients. As such, this exploratory study aims to identify for

the first time such challenges as well as physicians' self-reported levels of cultural competence. Doing so, we hope to come up with insight that might help improve ER working environments and ensure high-quality care for everyone.

Methods

We conducted an online survey between September and December 2023 to evaluate the challenges ER physicians face while taking care of migrant patients (i.e., persons born and raised outside of Belgium) in Brussels and Wallonia. We obtained complete responses from 50 physicians (62% female, 36% male, M_{Age} = 39). Our analyses were carried out in two parts: (1) tapping into the challenges faced by the doctors in the ER, (2) measuring the levels of cultural sensitivity and cultural competencies.

Results

Our analyses (1) demonstrated that respondents on average report having a high interest in taking care of migrant patients while 60% report difficulties in communication with them. On average they believed that migrant patients visit the ER more often than they do other medical services. 98% reported an absence of 24/7 translation services, 82% a lack of documentation in minority languages, 90% that they do not have universal pictograms at their disposal to facilitate communication. Our second group of analyses (2) demonstrated that the self-reported cultural competency increases with age and is higher among physicians working in urban areas. Furthermore, we observed that with increasing age physicians believe more that it is the migrant patient who should adapt to the prevalent norms of the healthcare system than the other way around. Finally, we observed the importance given to the knowledge concerning the history of migration of patients to be higher among younger physicians.

Discussion

As such, the findings presented in this study highlight disparities in physicians' beliefs while reflecting on the challenges posed by multiculturalism as well as the possible ways to address them. Our findings further point to an increasing

need to structurally address such issues in the ER to aid physicians in the care of migrant patients. As such, we believe that certain improvements to facilitate communication (e.g., documentation in various languages, availability of universal pictograms for basic communication, availability of translation services, etc.) could ameliorate the work environment for ER professionals as well as the overall quality of the emergency care for everyone[3]. In brief, with this study we were able to shed an initial light on this issue in the Belgian context, and we hope to stimulate a debate on potential organisational, structural and cultural changes to the ER[4] to further facilitate more inclusive and equal emergency care[5].

References

[1] https://statbel.fgov.be/fr/themes/population/origine, consulté le 14/05/2023

[2] Weaver C, Sklar D. Diagnostic dilemmas and cultural diversity in emergency rooms. *West J Med*. 1980;133(4):356-366.

[3] Lundin C, Hadziabdic E, Hjelm K. Language interpretation conditions and boundaries in multilingual and multicultural emergency healthcare. *BMC Int Health Hum Rights*. 2018;18(1):23. Published 2018 Jun 5. doi:10.1186/s12914-018-0157-3

[4] Betancourt JR, Green AR, Carrillo JE, Ananeh-Firempong O 2nd. Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. *Public Health Rep*. 2003;118(4):293-302. doi:10.1093/phr/118.4.293

[5] Franks NM, Gipson K, Kaltiso SA, Osborne A, Heron SL. The Time Is Now: Racism and the Responsibility of Emergency Medicine to Be Antiracist. *Ann Emerg Med*. 2021;78(5):577-586. doi:10.1016/j.annemergmed.2021.05.003

Pulmonary embolism: Three-month mortality study in patients during COVID period

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Citation
Paternostre, V., Evrard, V., Brousmiche, K. Pulmonary embolism: Three-month mortality study in patients during COVID period.

Introduction

Venous thromboembolism (VTE) ranks as the third most common vascular disease after acute myocardial infarction and stroke. During the early stages of the COVID-19 pandemic, a heightened frequency of pulmonary embolism (PE) cases was observed.

Aim

This study aims to assess the three-month mortality of pulmonary embolism patients with COVID patients compared to non-COVID patients.

Methods

We conducted a retrospective analysis of 228 confirmed PE cases between November 2020 and May 2022 in our institution (bicentric). Patients were categorized into two groups based on COVID-19 status determined by nasopharyngeal PCR tests. We compared three-month mortality rates using Kaplan-Meier curve analysis and explored potential risk factors for mortality.

Results

A significant difference was observed in survival distributions between non-COVID and COVID-positive patients (p=0.0329) (Table 1) Fig 1.

TABLE 1: Survival data for the covid positive and covid negative group

Follow up time	All patients	Covid negative patients	Covid positive patients
0 month	100.0% (100.0%-100.0%)	100.0% (100.0%-100.0%)	100.0% (100.0%-100.0%)
1 month	95.5% (91.9%-97.6%)	98.6% (94.6%-99.7%)	88.1% (76.7%-94.2%)
2 months	94.6% (90.8%-96.9%	97.3% (92.8%-99.0%)	88.1% (76.7%-94.2%)
3 months	93.7% (89.7%-96.2%)	95.9% (91.0%-98.1%)	88.1% (76.7%-94.2%)

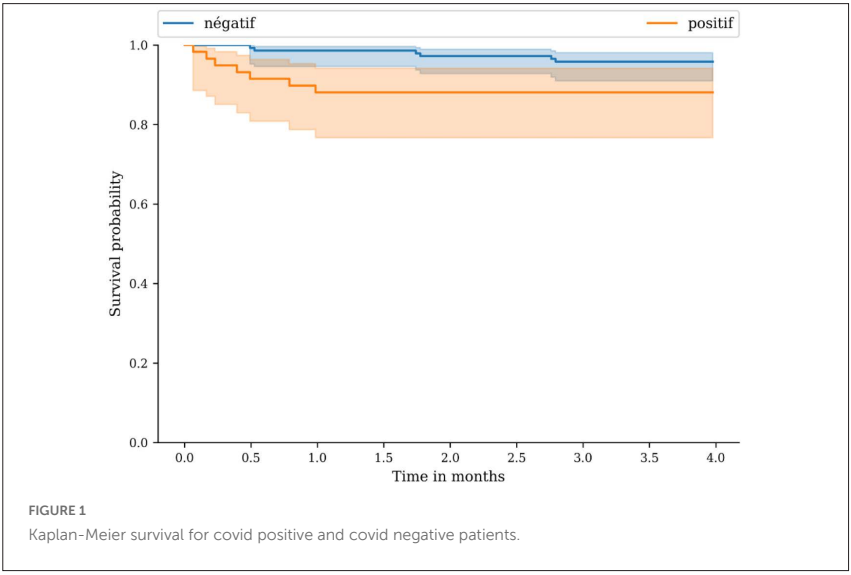

FIGURE 1

Kaplan-Meier survival for covid positive and covid negative patients.

No significant disparities were found in patient age, presence of active cancer, PESI score ≥ 3, or embolism location (central vs. peripheral). However, there were significantly more cases of deep vein thrombosis among non-COVID patients (p=0.188). COVID-positive patients had longer mean hospital stays (10.29 days) and intensive care unit stays (2.27 days) compared to non-COVID patients (6.68 days and 0.42 days, respectively).

Discussion

COVID-19 infections exhibit a spectrum of severity, ranging from asymptomatic carriage to severe pneumonia and multi-organ failure [1-2]. Severe COVID-19 cases are often associated with increased thromboembolic events [3-5]. Additionally, patients with more severe COVID-19 tend to have more comorbidities, likely contributing to higher mortality rates, with some COVID-positive patients potentially succumbing to complications like ARDS.

Since the onset of the pandemic, various strains of COVID-19 have emerged, affecting individuals differently. In this study, we did not differentiate between these different subtypes of COVID-19. It's noteworthy that advancements in understanding and managing COVID-19, including vaccination efforts, may impact patient outcomes over time.

With our method of classifying the two groups using PCR tests, sensitivity and specificity are not perfect. This method does not provide information regarding the severity of symptoms or the stage of pathology. A positive PCR result may indicate prolonged viral RNA excretion without active infection.

Conclusion

Three-month mortality among patients with pulmonary embolism is significantly higher in those with concurrent COVID-19 infection compared to those without. As the pandemic evolves, COVID-19 status could serve as a severity criterion for patients with pulmonary embolism.

References

[1] Menni C, Valdes AM, Polidori L, et al. Symptom prevalence, duration, and risk of hospital admission in individuals infected with SARS-CoV-2 during periods of omicron and delta variant dominance: a prospective observational study from the ZOE COVID Study. Lancet 2022; 399:1618

[2] Ma Q, Liu J, Liu Q, et al. Global Percentage of Asymptomatic SARS-CoV-2 Infections Among the Tested Population and Individuals With Confirmed COVID-19 Diagnosis: A Systematic Review and Meta-analysis. JAMA Netw Open 2021; 4:e2137257.

[3] Panigada M, Bottino N, Tagliabue P, et al. Hypercoagulability of COVID-19 patients in intensive care unit: A report of thromboelastography findings and other parameters of hemostasis. J Thromb Haemost 2020; 18:1738.

[4] Mansory EM, Srigunapalan S, Lazo-Langner A. Venous Thromboembolism in Hospitalized Critical and Noncritical COVID-19 Patients: A Systematic Review and Meta-analysis. TH Open 2021; 5:e286.

[5] Spyropoulos AC, Bonaca MP. Studying the coagulopathy of COVID-19. Lancet 2022; 399:118.

Are Belgian emergency physicians prepared to coordinate an operating room evacuation, when our anesthesiologists are not?

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Introduction

In 2023 research was conducted in the Flemish university hospitals regarding the knowledge of managing an operating room (OR) fire. Results showed a lack of knowledge and preparation amongst the different departments of anesthesiology.[1]

The risk however for such events is far from nonexistent. On yearly basis 650 US citizens die or sustain lifelong disability due to operating room fires. Despite Belgian data lacking, this is supported with similar data from the UK.[2]

Hospital preparedness, including critical care area evacuation, is a vital part of disaster management. Given that anesthesiologists frequently work in critical care and in the provision of prehospital emergency medicine service (MUG/SMUR), it seems opportune to increase their skill set regarding disaster management.

Methods/Setting

In 2022 a literature study and variant Delphi method were used to map the current knowledge regarding fire incidents in, and emergency evacuation of the OR. In 2023 this research added a qualitative descriptive anonymized cross-sectional study in a select sample by means of a survey amongst anesthesiologists (residents), working in the Flemish university hospitals. In total 297 got invited to participate to the survey, 64 responded.[1]

Results

Most respondents reported a lack of knowledge and self-confidence regarding the necessary steps to be undertaken during an OR fire. This was confirmed by a free text question, investigating their suggested course of action. Only 17,2% knew how to respond in an optimal way (as composed by literature & the Delphi panel). Their knowledge and self-confidence increased (self-reported) after reading our new designed algorithm concerning OR fire Fig 1 and evacuation.[1]

Despite the sample being too small to make any statistically significant statements, a tendency was noted towards better knowledge amongst anesthesiologists with interest towards disaster management and emergency medicine.[1] Which might be a parallel to the conclusion of earlier Belgian research showing more proficiency in disaster medicine amongst military medicine students compared to their civilian counterparts.[3]

Anesthesiologists with real life experience of an OR fire incident, scored best.[1]

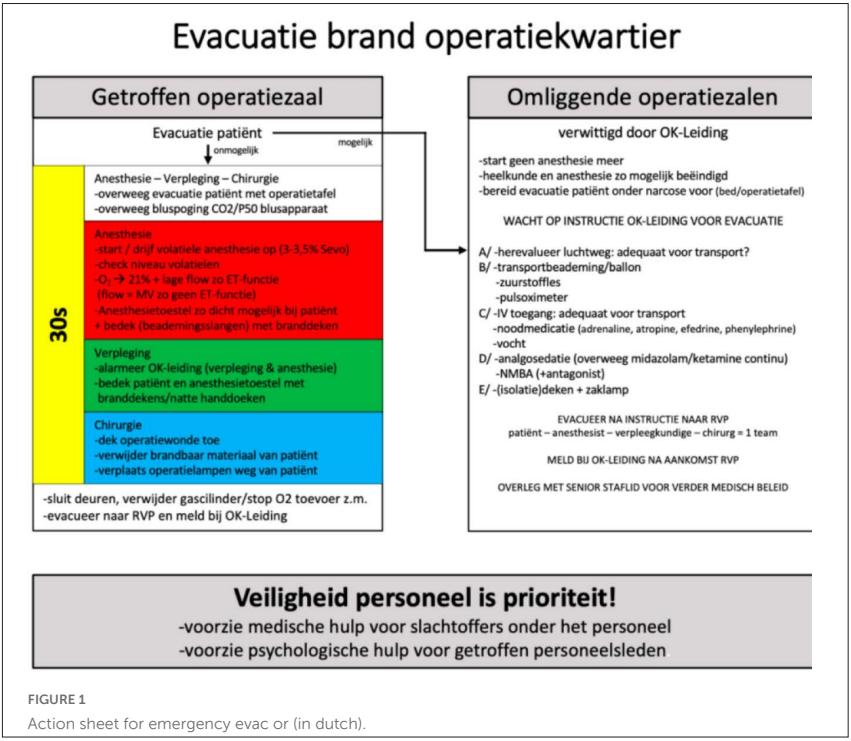

FIGURE 1
Action sheet for emergency evac or (in dutch).

Discussion

The risks of an OR fire and the associated emergent evacuation comes with specific challenges.[2] At this point, our data suggest that anesthesiologists are not fully prepared for managing this critical event.[1]

If a major fire would take place in any other building, then according to the Belgian disaster management format, a multidisciplinary operational command would be formed in which an emergency physician would take the roll as medical commander (Dir-Med) to manage and coordinate the situation. This raises the question whether emergency physicians could fulfill the role of an in-hospital operational command during an OR fire.

In 2017, Belgian research showed there was a lack of training in disaster management amongst emergency medicine residents. Often leading to feelings of insufficient confidence in managing such situations. A plead was held for more and mandatory training.[4]

We propose follow up studies regarding this topic to track evolution in disaster medicine proficiency amongst emergency medicine residents, as well as self-inspection amongst emergency physicians regarding their proficiency in managing such events.

Are you prepared?

References

[1] Wouters A. (2023), 'Brand in het operatiekwartier, een hot topic?', Antwerpen

[2] Kelly FE, Bailey CR, et al 'Fire safety and emergency evacuation guidelines for intensive care units and operating theatres: for use in the event of fire, flood, power cut, oxygen supply failure, noxious gas, structural collapse or other critical incidents: Guidelines from the Association of Anaesthetists and the Intensive Care Society.' Anaesthesia. 2021

[3] Mortelmans LJ, Lievers J, et al. 'Are Belgian military students in medical sciences better educated in disaster medicine than their civilian colleagues?' J R Army Med Corps. 2016

[4] Schepers L. (2017) Vertrouwen en kennis rampenmanagement bij assistenten urgentiegeneeskunde. Ideale kans op verbetering? Antwerpen.

Near fatal vaginal injury caused by waterski

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Introduction

We describe a nearly fatal vaginal bleeding after waterskiing, with decision to perform an add-on interventional radiology. This report describes the first documented case of a water-related personal watercraft trauma in Belgium.

Case Report

A 56-year-old female in otherwise healthy conditions, was waterskiing at the local canal when she fell in the water. She felt a ripping vaginal sensation by a wave of water and blood oozing out of her vagina. Trying to stop the heavy bleeding by holding towels against her vagina, acquaintances brought her unannounced, to the emergency department in Menen, Belgium.

At presentation the patient was hemodynamic unstable. Inspection of the vagina showed towels who were drenched in blood. An extended focused assessment sonography was performed and showed free fluid around the uterus. Following the inhospital protocol, 1g of tranexamic acid (Exacyl©) was given intravenously and the massive transfusion protocol was activated. Un urgent CT-scan showed a rupture of the vaginal cavity with an active arterial bleeding. In the operation room the senior gynaecologist sutured the perforation and packed the vagina. Meanwhile patient received polytransfusion and 3 grams of calcium gluconate intravenously. Although the perforation was sutured successfully and patient became hemodynamic stable, the active bleeding site was difficult to visualize. After peroperative counsel between the surgeon and radiologist, the decision was made to perform an embolization of both the arteriae iliaca internae. The patient was transported to the affiliated supraregional trauma centre in Roeselare. Postoperatively, patient was hospitalized at the intensive care unit where she remained hemodynamic stabile. Empiric high dose amoxiclavulanic acid intravenously was initiated.

Discussion

Water-skiing injuries with hydrostatic vaginal trauma have been described since 1990.[1] The theory was suggested that the vagina was acting as a conduit which directed the force of water to the upper vagina with perforation as a result. As such should these traumas be considered as penetrating trauma.[2] An overall mortality rate of 6.25% proves the potential life-threatening harm of these kind of traumas.[3] Seen the high mortality rate, a standardized management of these patient is necessary. Etienne et al. suggested an interdisciplinary approach with inclusion of adequate resuscitation and transfusion, rectovaginal examination, explorative laparoscopy or laparotomy for unstable patients, and empiric antibiotic coverage.[3] Damage control surgery could be a Hartmann's procedure or primary anastomosis of the perforation with rectal trauma, and transvaginal sutures of any vaginal lacerations. A laparotomy is recommended because, in addition to damage control, this may reveal vascular lesions. [4] The antibiotic

used for empiric coverage needs to be adapted to the common waterborne species such as E. coli, Shigella, Campylobacter, Vibrio cholerae, Salmonella, Yersinia enterocolitica and Aeromonas hydrophila.[5]

In this case the decision was made to withhold from an explorative laparotomy seen the patient became hemodynamic stable after transvaginal suturing and polytransfusion. To stop the arterial bleeding the decision was made to perform an add-on embolization of both the arteriae iliaca internae rather than an explorative surgery. This case report is the first to describe this approach. In hindsight the use of a fluoroquinolone would have been a better choice for antibiotic coverage than high-dose amoxiclavulanic acid intravenously.

Conclusion

Vaginal injury after waterskiing is a possible deadly injury and needs to be addressed as a penetrating trauma. An interdisciplinary traumateam approach is imperative with a low threshold for transfusion and explorative laparoscopy or laparotomy. Empiric antibiotic coverage needs to be adapted to the common waterborne species.

References

[1] Wein P, Thompson DJ. Vaginal perforation due to jet ski accident. *Aust N Z J Obstet Gynaecol* 1990; 30: 384-385.

[2] Freeman MD, Everson TM, Kohles SS. Forensic epidemiologic and biomechanical analysis of a pelvic cavity blowout injury associated with ejection from a personal watercraft (jet-ski). *J Forensic Sci* 2013; 58: 237-244.

[3] Etienne JH, Rahili MA, Estran Mareva. Literature review on hydrostatic vaginal and anorectal injuries caused by personal watercraft. *Trauma* 2021; 23(4): 265-275.

[4] Haefner HK, Andersen HF, Johnson MP. Vaginal laceration following a jet-ski accident. *Obstet Gynecol* 1991; 78(5pt2): 986-988.

[5] Atlas I, Jerdev M, Younis JS, et al. Falling behind a jet ski: a sad end to a pleasure ride. *Trauma* 2016; 18(1): 65-69.

Prediction of medium-term vital and functional prognosis by severity and frailty scores in older patients admitted to the emergency department: A prospective bicentric cohort study

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Martinage, M., Coulon, A., Brauwer, I.D., Bourmorck, D., Steenebruggen, F. Prediction of medium-term vital and functional prognosis by severity and frailty scores in older patients admitted to the emergency department: A prospective bicentric cohort study.

Introduction

The number of older people (OP) attending the emergency department (ED) is increasing (1). In this context, OP triage is essential to ensure optimal medical and financial management of this heterogeneous population. Triage scores have become a standard of care in most ED, enabling to determine the **severity** of the condition that brings patients to the ED and to provide rapid and appropriate care. Despite growing awareness, there is still few published data on the influence of OP **frailty** on ED triage procedures (2). We therefore wanted to test the added value of a frailty score and geriatric redflags on mortality and functional decline prediction in OP.

Methods

This is a secondary analysis of a prospective cohort study of OP (≥75 years) admitted in two Belgian EDs from 12/2019 to 02/2020 (interrupted due to

Cognition		
Instruction: Ask the patient the following questions. If the patient does not respond, the question is rated incorrect.		
What day is today?	Incorrect*	Correct
What is the date today? (± 1 day is correct)	Incorrect*	Correct
What year is this?	Incorrect*	Correct
Spell "radio" backwards. §	Incorrect	Correct
Evaluation consistent with impairment of cognition (if one single response was incorrect):	*Yes*	*No*
Falls		
Instruction: Rate the following questions considering all available sources (patient, proxy, observation, reports).		
Did the patient present to the ED because of a fall?	Yes*	No
Did the patient have one or more falls during the last 12 months? #	Yes	No
Evaluation consistent with patient history of falls (if one single response was yes):	*Yes*	*No*
Mobility		
Instruction: Rate the following question considering all available sources (patient, proxy, observation, reports).		
Did the patient require walking aids (cane, wheeled walker, or helping person) in- or outdoors before presenting to the ED? #	Yes	No
Instruction: Rate the following questions according to the current situation in the ED.		
Is the patient currently confined to bed?	Yes*	No
Does the patient currently need help (walking aids or helping person) to get out of bed?	Yes*	No
Does the patient need ≥20 seconds for the Timed Up and Go Test? §	Yes	No
Evaluation consistent with impairment of mobility (if one single response was yes):	*Yes*	*No*
ADL		
Instruction: Rate the following question considering all available sources (patient, proxy, observation, reports).		
Did the patient require assistance for personal hygiene (sponge bath, tub bath, or shower) before presenting to the ED?	Yes*	No
Instruction: Rate the following questions according to the current situation in the ED.		
Is the patient currently confined to bed or does he need help (walking aid or helping person) to get out of bed?	Yes*	No
Does the patient require assistance (for direct help or instruction) for dressing (clothes or shoes)? §	Yes*	No
Does the patient require assistance (for direct help or instruction) for toileting? §	Yes*	No
Does the patient require assistance (for direct help or instruction) for feeding? §	Yes	No
Evaluation consistent with impairment in ADL (if one single response was yes):	*Yes*	*No*

ADL = activities of daily living; ED = emergency department.
* If one of the responses marked with an asterisk applies, the rater may directly proceed to evaluating the domain (hierarchical structure).
§ Not routinely assessed in our institution
# Not used in data analysis

* Schoenenberger AW, Bieri C, Özgüler O, Moser A, Haberkern M, Zimmermann H, et al. A novel multidimensional geriatric screening tool in the ED: evaluation of feasibility and clinical relevance. Am J Emerg Med. juin 2014;32(6):623-8

FIGURE 1

Locally used Red-Flags screening tool inspired from schoenenberger et al.

Covid pandemic). Frailty was defined by a premorbid Clinical Frailty Scale (CFS) ≥ 5 retrospectively scored following the algorithm proposed by Theou et al. (3), or the presence of ≥ 1 geriatric redflag (RF) as defined in figure 1 (4). Illness acuity was retrospectively assessed using the "Classification Infirmière des Malades aux Urgences » (CIMU), ranging from 1 to 5 – the lower the score, the higher the acuity. We assessed a 6-month composite outcome (CO) appropriate to geriatric challenges, i.e. functional decline or mortality, by phone. Functional decline was defined as a decrease of ≥ 1 point in basic activities of daily living score (dichotomous KATZ score, ranging from 0 to 6, from most to less dependent) between preadmission and 6-month post-discharge status, or a new nursing home admission.

Results

During the study period, 179 patients were included (median age 83 years, 44% males). Table 1 summarizes OP characteristics. OP suffering from the CO (58%, n=104) had a significantly higher Charlson Comorbidity Index (p=0.04) and more often had ≥ 1 RF (p=0.01); they were more often disoriented in time (p=0.02) and needed more frequently help with personal hygiene (p=0.03). Frailty prevalence was higher, but not significantly, in OP suffering from the CO (p=0.06). They didn't present with a significantly higher CIMU score (p=0.88), but they were more often hospitalized (p=0.03). In multivariable analysis adjusted for age and gender, having ≥ 1 RF (p=0,039; OR=2,08 [1,04 ; 4,15]) or being disoriented (p=0,0489 ; OR 1,99 [1,01 ; 3,93]) was statistically associated with the CO. There was no correlation between CFS or CIMU with the CO.

Discussion

In our study, RF could « tag » OP at risk of adverse outcomes after an ED visit. None CFS, nor CIMU were significantly correlated with our outcome, probably partly due to sample size limitation (COVID pandemic). However, CFS feasibility in ED was previously questioned (5), while CIMU wasn't yet validated in OP. RF are frequent and easy to assess in ED (4) and could draw attention to main geriatric concerns to consider during the ED length of stay, e.g. by prevention or management of delirium. Future research should investigate best practice in the management of OP in ED.

TABLE 1: Sociodemographic characteristics and functional data at emergency admission

	Total (n=179)	Positive composite outcome (n=104)	Negative composite outcome (n=75)	p-value
General Characteristics				
Age (years) median (IQR)	83 (79 ; 87)	84 (79 ; 89)	82 (79 ; 87)	0.1178
Male / Female (% male)	79/100 (44)	44/60 (42)	35/40 (47)	0.6694
CCI (IQR)	6 (5 ; 7) [+2]	6,0 (5 ; 8)[+1]	5,5 (4 ; 7) [+1]	**0.0411**
Medications (n) median (IQR)	7 (4 ; 10) [+6]	7 (5 ; 11) [+6]	7 (4 ; 9)	0.3012
Living place [n (%)]				
At home	157 (88)	92 (88)	65 (87)	0.8964
Nursing home	19 (11)	12 (12)	7 (9)	0.8207
Living alone	70 (39)	39 (38)	31 (41)	0.7164
Red flags [n (%)]				
At least 1 positive RF	121 (69) [+4]	77 (74) [+4]	44 (59)	**0.0149**
Time disorientation	64 (38)[+9]	44 (46)[+8]	20 (27) [+1]	**0.0188**
Currently confined to bed	54 (31)[+4]	34 (34) [+4]	20 (27)	0.3821
Help needed to get out of the bed	62 (36)[+5]	41 (41)[+4]	21 (28)[+1]	0.1191
Admission to ED for fall	35 (20)[+5]	22 (22)[+5]	13 (17)	0.5447
Assistance required for personal hygiene	54 (31)[+4]	38 (38)[+4]	16 (21)	**0.0280**
CFS [n (%)]				
CFS ≥ 5	144 (80)	89 (86)	55 (73)	0.0648
CIMU [n (%)]				
CIMU 1 or 2	50 (28)	30 (29)	20 (27)	0.8793
Hospitalization [n (%)]				
Hospitalized in the same hospital	73 (42)[+5]	50 (50) [+5]	23 (31)	**0.0289**
ICU	4 (2)[+5]	3 (3)[+5]	1 (1)	1
Geriatrics department	27 (16)[+5]	19 (19)[+5]	8 (11)	0.9971

Bold values are statistically significant.

IQR = interquartile range ; CCI = Charlson Comorbidity Index ; RF = Red Flag ; ED = Emergency Department ; CFS = Clinical Frailty Scale ; CIMU = Classification Infirmière des Malades aux Urgences, ICU = Intensive Care Unit.

[+1] = 1 missing data; [+2] = 2 missing data; [+4] = 4 missing data; [+5] = 5 missing data; [+6] = 6 missing data; [+8] = 8 missing data; [+9] = 9 missing data

References

(1) Ukkonen M, Jämsen E, Zeitlin R, Pauniaho SL. Emergency department visits in older patients: a population-based survey. BMC Emerg Med. 2019 Feb 27;19(1):20.

(2) Pulok MH, Theou O, van der Valk AM, Rockwood K. The role of illness acuity on the association between frailty and mortality in emergency department patients referred to internal medicine. Age Ageing. 2020 Oct 23;49(6):1071-1079.

(3) Theou O, Pérez-Zepeda MU, van der Valk AM, Searle SD, Howlett SE, Rockwood K. A classification tree to assist with routine scoring of the Clinical Frailty Scale. Age Ageing. 28 juin 2021;50(4):1406-11.

(4) Schoenenberger AW, Bieri C, Özgüler O, Moser A, Haberkern M, Zimmermann H, et al. A novel multidimensional geriatric screening tool in the ED: evaluation of feasibility and clinical relevance. Am J Emerg Med. juin 2014;32(6):623-8.

(5) Shrier W, Dewar C, Parrella P, Hunt D, Hodgson LE. Agreement and predictive value of the Rockwood Clinical Frailty Scale at emergency department triage. Emerg Med J. 2021 Dec;38(12):868-873.

Assessment of factors contributing to the emergence of secondary post-traumatic stress disorders in the emergency resuscitation room: Preliminary results from a monocentric prospective study

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Ancion, A., Fritz, P., Rourre, A., Lejeune, N., Gosseries, O., Ghuysen, A., Martial, C. Assessment of factors contributing to the emergence of secondary post-traumatic stress disorders in the emergency resuscitation room: Preliminary results from a monocentric prospective study.

Introduction

Up to 25% of patients admitted for life-threatening emergencies might develop post-traumatic stress disorder (PTSD), later contributing to poorer state of health[1,2,3]. Key factors seem to be the perception of life-threatening danger during care and the level of compassion exuded by healthcare staff, but the precise and extensive study of triggers remains poorly investigated[2,3,4]. Therefore, this study aims to prospectively investigate the prevalence of PTSD among patients admitted in our emergency resuscitation room (RR) as well as the potential associated risk factors.

Methods

Two hundred patients admitted in our emergency RR will be included, starting from October 2023. Here, we report the preliminary results of 12 patients. We record real-time medical informations and medications, and conduct audio-visual recordings to assess healthcare providers' communication, attention to pain, and the care environment. Three follow-up interviews are conducted: within 3 days after RR discharge or awakening (T1), as well as at 2 (T2) and 6 (T3) months post-admission. During the first one, the Consultation and Relational Empathy (CARE) measure[3] and the Emergency Department (ED) threat perceptions scale[2] are administrated. During the following, we assess PTSD using the PTSD Checklist for DMS-5 (PCL-5), depression using the Patient Health Questionnaire-9 (PHQ-9) and anxiety using the Hamilton Anxiety Rating Scale (HAM-A).

Preliminary Results

Out of the 12 patients that we interviewed at 2-month, one (8%) reported a PTSD as identified by the PCL-5 Fig 1. This patient was also the only one for

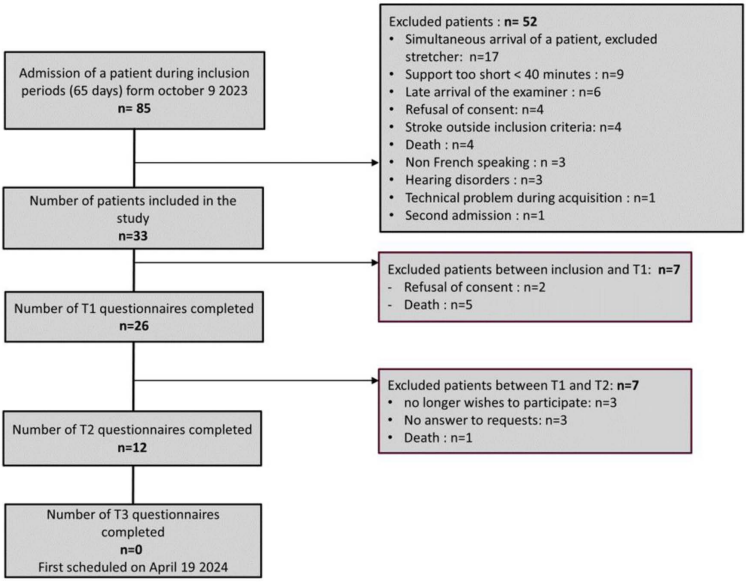

FIGURE 1
Flow chart of preliminary results from October 9 2023 till April 10 2024.

which we identified a severe depression using the PHQ-9 and a moderate to severe anxiety score using the HAM-A. Importantly, this patient reported a particularly high score on the ED threat perceptions scale. Using univariate statistics, we observed significant differences between the score of this patient and the group of patients who did not reach the cut-off score of the PCL-5 at the HAM-A ($p<0.001$) and at the PHQ-9 ($p=0.001$). We did not observe significant differences regarding the CARE ($p=0.313$) and the ED threat perceptions scale ($p=0.057$, even if approaching significance). Variables that differ significantly in univariate analyses will be included in multivariate binary logistic regression analyses to identify those that remain significantly associated with the emergence of PTSD.

Discussion

We expect to confirm the relationship between secondary PTSD following RR stay with threat and compassion perceptions previously described in litterature[2,3,4]. We aim to identify specific risk factors in patient care which condition the emergence of PTSD using a standardized analysis of audio-visual recordings. We anticipate potential association with the proficiency level in therapeutic communication. For the patient mentioned in this small sample, we could consider these high scores at HAM-A and PHQ-9 as confounding factors.

Conclusion

This study may ultimately contribute to reducing PTSD after RR care by addressing factors that can trigger it.

References

[1] Kovalsky D, Roberts MB, Freeze B, Moss J, Jones CW, Kilgannon H, Edmondson DE, Trzeciak S, Fuller BM, Roberts BW. Posttraumatic stress disorder symptoms after respiratory and cardiovascular emergencies predict risk of hospital readmission: A prospective cohort study. Acad Emerg Med. 2022 May;29(5):598-605. doi: 10.1111/acem.14438. Epub 2022 Feb 10. PMID: 35064719.

[2] Cornelius T, Agarwal S, Garcia O, Chaplin W, Edmondson D, Chang BP. Development and Validation of a Measure to Assess Patients' Threat Perceptions in the Emergency Department. Acad Emerg Med. 2018 Oct;25(10):1098-1106. doi: 10.1111/acem.13513. PMID: 29972892; PMCID: PMC6185758.

[3] Moss J, Roberts MB, Shea L, Jones CW, Kilgannon H, Edmondson DE, Trzeciak S, Roberts BW. Healthcare provider compassion is associated with lower PTSD symptoms among patients with life-threatening medical emergencies: a prospective cohort study. Intensive Care Med. 2019 Jun;45(6):815-822. doi: 10.1007/s00134-019-05601-5. Epub 2019 Mar 25. PMID: 30911803.

[4] Moss J, Roberts MB, Shea L, Jones CW, Kilgannon H, Edmondson DE, Trzeciak S, Roberts BW. Association Between Perceived Threat and the Development of Posttraumatic Stress Disorder Symptoms in Patients With Life-threatening Medical Emergencies. Acad Emerg Med. 2020 Feb;27(2):109-116. doi: 10.1111/acem.13877. Epub 2019 Nov 24. PMID: 31650652.

Diagnosis, outcome and allergology follow-up of adult patients after an emergency department evaluation for suspected hypersensitivity reactions in a Belgian tertiary hospital

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Citation

Debie, T., Mangelschots, E., Beyens, M., Vermeulen, G. Diagnosis, outcome and allergology follow-up of adult patients after an emergency department evaluation for suspected hypersensitivity reactions in a Belgian tertiary hospital.

Introduction

There is significant variation in evaluation and management of patients with suspected hypersensitivity reactions (HRs) in Emergency Departments (ED). Patients with signs and symptoms compatible with an immediate HR but not meeting criteria for anaphylaxis, are sometimes too hastily reassured and discharged by emergency physicians (1). The widespread occurrence, severity, and potentially life-threatening nature of HRs emphasize the importance for all healthcare providers to understand the pathology and how to manage it (2,3). The aim is to study the patient population presenting with suspected HRs at the ED of the Antwerp University Hospital and identify criteria suited for patient referral to an allergy or dermatology specialist.

Methods

A monocentric observational retrospective cohort study was conducted. Over the period from 1/1/2019 to 30/4/2022, patients aged 16 or older who presented to the ED with symptoms compatible with an immediate hypersensitivity reaction were included. Age, sex, symptoms, medical therapy, disposition, return visit to the ED and follow-up consultation were registered. For those who had a follow-up consultation, ED diagnosis was compared to the final diagnosis.

Results

A total of 611 emergency presentations were included, of which 81 cases were considered anaphylaxis Fig 1. Skin symptoms were present in 90% of cases, with urticaria being present in approximately half of them. Only 4% of the total study population was hospitalized, with the rest being treated on an outpatient basis, with or without extended observation in the ED. No deaths resulted from immediate HRs. Approximately 11% of all patients represented to the ED after initial discharge. In retrospect, adrenaline was administered inappropriately in 23 cases who did not meet criteria for anaphylaxis. On the other hand, in 22 patients with anaphylaxis adrenaline was not administered despite indication. Allergology or dermatology follow-up was explicitly advised in 70% of cases, but only carried out in less than two-thirds of these. Among those who had a follow-up consultation, the ED diagnosis

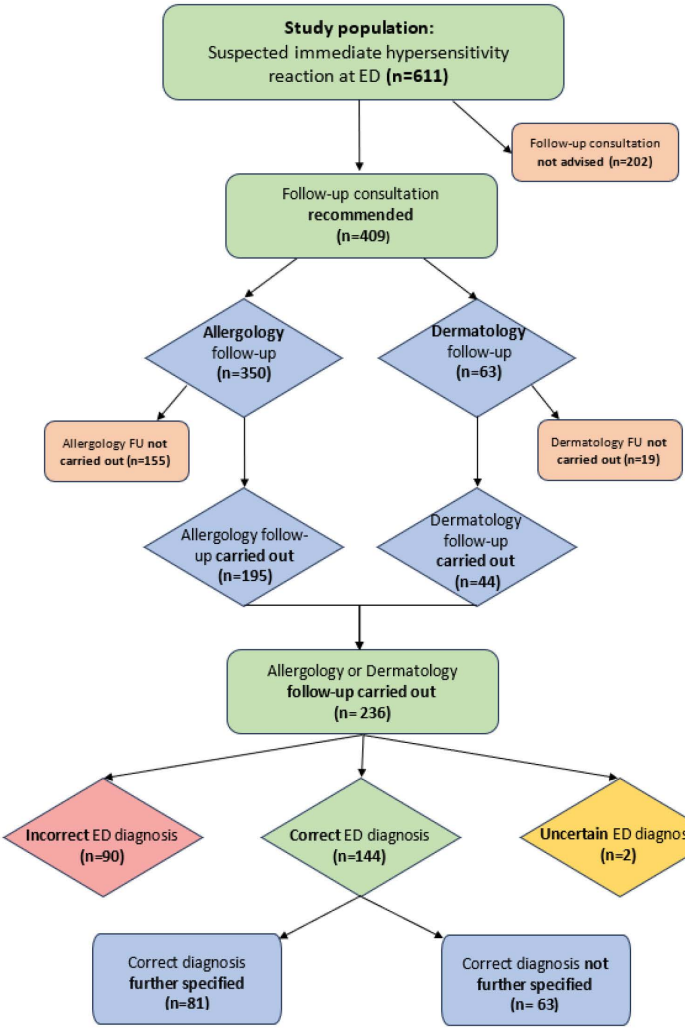

FIGURE 1
Inclusion flowshart to describe population under study.

was correct in 61% and further specified in 56.3% of cases. When there was suspicion of drug allergy or no clear trigger could be identified, the ED diagnosis was correct in only 42% and 36% respectively, being the categories where emergency physicians scored the lowest.

Discussion

Accurate diagnosis of HRs is critical because the initial presentation of an immediate HR might be mild, but subsequent exposure to the same culprit might result into anaphylaxis. Our findings emphasize the significance of additional outpatient assessment in cases where there is suspicion of an immediate HR, especially when the trigger is a drug or is not clear at time of presentation. Patient adherence to follow-up recommendations was remarkably low, and should be enhanced as confirming a HR not only helps reduce the risk of a severe reaction upon allergen re-exposure, but also prevents patients from unnecessarily avoiding the presumed allergen.

References

(1) Hitti EA, Zaitoun F, Harmouche E, Saliba M, Mufarrij A. Acute allergic reactions in the emergency department: characteristics and management practices. Eur J Emerg Med Off J Eur Soc Emerg Med. augustus 2015;22(4):253-9.

(2) Cardona V, Ansotegui IJ, Ebisawa M, El-Gamal Y, Fernandez Rivas M, Fineman S, e.a. World Allergy Organization Anaphylaxis Guidance 2020. World Allergy Organ J. oktober 2020;13(10):100472.

(3) Muraro A, Worm M, Alviani C, Cardona V, DunnGalvin A, Garvey LH, e.a. EAACI guidelines: Anaphylaxis (2021 update). Allergy. februari 2022;77(2):357-77.

PACED COVID19 - Patient characteristics at the emergency department during the COVID-19 pandemic – A retrospective analysis of emergency department attendances including a subgroup analysis of psychiatric emergency department visits at the university hospital of Ghent

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Citation
Pryck, J.D., Desmet, T., Paepe, P.D. PACED COVID19 - Patient characteristics at the emergency department during the COVID-19 pandemic – A retrospective analysis of emergency department attendances including a subgroup analysis of psychiatric emergency department visits at the university hospital of Ghent.

Introduction/Objective

Although emergency departments (EDs) worldwide were bracing for increased demand during the COVID-19 pandemic, many experienced

a decrease in visits during the lockdown. This study aims to describe the impact of the first Belgian COVID-19 wave and the associated lockdown measures on a Belgian ED. The primary objective is to characterize the changes in patient demographics, attendance volume and reasons for admission. The secondary objective is to investigate psychiatric emergencies, as literature suggests these presentations would be influenced by the pandemic or lockdown and because they form a well-defined group.

Materials and Methodology

This study is a retrospective observational study conducted at the Ghent University Hospital as part of the "PACED COVID-19 Study". Data on demographics, reasons for admission and triage criteria were collected from patients visiting the Emergency Department between March 1st and May 31st, 2020, and compared to ED visits during the same period in 2019. A detailed analysis focusing on reasons for encounter and psychiatric comorbidities was performed for all ED visits involving psychiatric presentations in the same study period. Statistical analysis was conducted using a Pearson chi-squared test, with a P-value of less than 0.05 considered statistically significant.

Results

The COVID-19 pandemic led to a 15% decrease in ED visits, particularly during the initial weeks of the lockdown. Respiratory complaints became the leading cause of ED admissions. The proportion of mental health presentations in the ED significantly declined during the COVID-19 lockdown dropping from 11.4% to 8.7% ($P < 0.01$). However, among psychiatric presentations, there was a notable increase in the proportion of psychotic disorders, rising from 14% in 2019 to just over 20% in 2020 ($P < 0.01$). The proportion of mental health patients with underlying chronic substance abuse nearly doubled from 22.3% in 2019 to 41.0% during the pandemic ($P < 0.01$), even though they did not present with substance abuse as their primary reason for admission.

Conclusion

The COVID-19 pandemic significantly impacted ED visits, resulting in a decrease in overall presentations compared to 2019. The proportion of mental health-related presentations also declined, while there was an increase in chronic substance use within the presenting group. Further research is needed to determine the reasons behind the reduction in overall and psychiatric ED presentations. It is unlikely that the implementation of social distancing measures during the lockdown is the sole cause. Factors such as reluctance to visit EDs due to fear of contracting COVID-19 and individuals attempting to address their psychological problems through alternative means rather than seeking medical help may also contribute.

A potentially fatal mushroom poisoning: A case report

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Citation
Bulterys, M., Cakici, O., Lenaerts, L., Meersman, A. A potentially fatal mushroom poisoning: A case report.

Background

The Belgian poison control center (PCC) is contacted 400 times per year in relation to mushrooms. 60% are accidents with children, 20% mushroom pickers for dinner and 20% users of hallucinogenic mushrooms. The aim of this report is to present a case of potentially fatal mushroom poisoning and how to handle it in the emergency department.

Setting

A 24-year-old man regularly ate mushrooms for their psychedelic effects and ingested two familiar mushrooms and one unknown species, which he picked from the woods in Diepenbeek, Belgium. He showed an online picture of the amanita phalloides, explaining the uncontrolled desire to find and eat it. Amanita phalloides, also known as death cap, is one of the most poisonous mushrooms. It accounts for more than 90% of fungus-related poisoning deaths in Europe. 17% of the patients die within 10 days after ingestion.

Results

The patient presented at the emergency department 24 hours after eating the mushrooms. He was conscious but pale, dehydrated and agitated. The initial symptoms were abdominal cramps, vomiting and diarrhea, which started 8 hours after ingestion. Lab showed a creatinine 1.68 mg/dL, GFR 56 mL/min and hyperkalemia 7.42 mmol/L which was confirmed in multiple blood gas analyses. The severe hyperkalemia was probably due to dehydration and acute kidney injury but is not a typical manifestation of this toxidrome. The liver function tests and coagulation tests were normal. Initial management consisted of hyperkalemia treatment and fluid replacement. The description of the mushroom, the psychiatric component and the latency of the symptoms raised the suspicion of amanita phalloides intoxication. The PCC was urgently contacted and the mycologist on call was consulted, resulting in the advice to start N-acetylcysteine and silybin therapy. The patient was transferred to a liver transplantation center for further observation. In the following period no liver synthesis problems occurred and the patient recovered. The mycologist retrospectively raised the hypothesis that the mushroom may have been russula aeruginea, which looks like amanita phalloides.

Discussion

The amanitin toxin is rapidly absorbed by the intestine and transported to the liver where it blocks the production of mRNA and protein synthesis in liver cells. The liver is the main target organ of toxicity. There is no specific antidote but there are multiple strategies that aim to counteract toxicity by interrupting enterohepatic recirculation. Three medications are available: penicillin G, silybin, and N-acetylcysteine. Other therapeutic options include gastric lavage and the administration of activated charcoal if done early. The role of forced diuresis, hemodialysis and plasmapheresis is being debated. Rapid progression to hepatic encephalopathy, hepatorenal syndrome, or coagulopathy are indications for liver transplantation.

Conclusions

The diagnosis is generally made based on the clinical manifestations and their latency. A mycologist is best consulted as soon as possible to identify the type of mushroom as this is imperative for optimal risk assessment. The mushroom identification is not a responsibility of the emergency physician, as it is out of their expertise, but should be made by a mycologist. The PCC has a network of mycologists on call.

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