

Belgian Society of Emergency and Disaster Medicine BESEDIM - 35th anniversary congress - 2025

Antwerp, Belgium



Belgian Society of Emergency and Disaster Medicine BESEDIM - 35th anniversary congress - 2025, Antwerp, Belgium

ISBN 9782832551288

DOI 10.3389/978-2-8325-5128-8

Citation Belgian Society of Emergency & Disaster Medicine BESEDIM. (2025)

February 26-28, 2025, Antwerp, Belgium

The abstracts in this collection have not been subject to any Frontiers peer review or checks, and are not endorsed by Frontiers. They are made available through the Frontiers publishing platform as a service to conference organizers and presenters. The copyright in the individual abstracts is owned by the author of each abstract or their employer unless otherwise stated. Each abstract, as well as the collection of abstracts, are published under a Creative Commons CC-BY 4.0 (attribution) licence (creativecommons.org/licenses/by/4.0/) and may thus be reproduced, translated, adapted and be the subject of derivative works provided the authors and Frontiers are attributed.

For Frontiers' terms and conditions please see: frontiersin.org/legal/terms-and-conditions.



Table of Contents

8 Welcome to the Belgian Society of Emergency and Disaster Medicine BESEDIM - 35th anniversary congress - 2025

- 10 Venous air embolism mimicking anaphylactic shock after intravenous contrast injection: A case report De Vos K, Janssens E, Gevaert A, De Maeyer C, Monsieurs K, Verdonck P
- 13 When foot pain conceals a fatal threat: A case of fulminant meningococcemia
- 17 Feeling unwell after diving: There's more than meets the eye Blondeau Loïc, Anseeuw Kurt

20 Sodium nitrite toxicity: A walk in the park? Charlotte Faes, Alexander Vermassen, Nele Vereycken, Hannelore Raemen

- 24 Respiratory diphteria in a 16-year-old who developed multiple life-threatening complications Genot Juliette, Thomas Boisdenghien, Mahmoud Kaabour, Axel Derwa, Sergio Rizzi, Marie Belleflamme
- 29 Kearns-Sayre Syndrome: Case presentation and literature review of high-risk features suggestive of cardiac syncope in the Emergency Department

Julien Higny, Francis Ntwali, Marco Natile, Pierre-Yves Henin, Nicolas Moreau, Frédéric Forêt, Martin Benoît



34 Superior vena cava syndrome – Case report

Joke Baeyens, Lieselot Blomme, Ives Hubloue

37 Marian Thistle Poisoning at the Sint Maria hospital: A case report

Niens, Iris, Haest, Elke, Vermeersch, Nick, De Rouck, Ruben

40 Lateral canthotomy and cantholysis post blepharoplasty – Case report

Joke Baeyens, Paul Cardon, Evert Verhoeven, Ives Hubloue

43 Tick-borne encephalitis: To vaccinate or not to vaccinate - A case report

Tine Anthierens; Marc Bourgeois; Ives Hubloue

- 46 Coronavirus-induced vulvar aphthosis A case report Tine Anthierens, Simon Scheyltjens
- 50 To PEP or not to PEP; A retrospective analysis of (non) occupational post-exposure prophylaxis cases reported in the emergency department in order to refine the local treatment algorithm

Liesbeth Deroose, Bram Depelseneer, Nick Cleymans, Tania Desmet

53 Analysis of a modified Manchester triage scoring system for redirecting patient flow away from the Emergency Department of a University hospital in Belgium

J. Libeer, T. Desmet, N. Cleymans

56 Hemoglobin as a predictor of neurologic outcome after OHCA: A retrospective study Saen M, Frigerio M, Cogozzo C, de Longueville D, de Villenfagne MA,

Clignez G, Malinverni S



61 Integrating biomarkers and clinical decision rules for optimized CT Use in mild traumatic brain injury: A systematic review

Justine Vanderstraeten, Said Hachimi Idrissi

63 Assessing the need for a Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) On-call service in a European major trauma centre: A retrospective cohort analysis

Steven Van Schandevyl, Eva Janssens, Tine Bosiers, Philip Verdonck

68 Hypertension grade III in the Emergency Department (ED) in Belgium

Myron Degelaen, Alexander Vermassen, Andrea Penaloza, Alexandre Persu, Christos Fragoulis, Lara Absil, Cornelia Genbrugge

71 Impact of the COVID-19 pandemic on pediatric psychiatric presentations in the Emergency Department: A retrospective analysis at Auxerre hospital

Ilinca Romocea, Cristian Terec, Bertrand Soto, Jeanette Akpona, Charles Chater, Caroline Toma

74 PACED COVID19 - Patient characteristics at the emergency department during the COVID-19 pandemic – A retrospective analysis of non-respiratory attendances and trends in trauma-related attendances at the University Hospital of Ghent

Henryk Bonte, Jolien De Pryck, Peter De Paepe, Tania Desmet;

77 Impact of clinical context on the interpretation of gallbladder ultrasound images: A pilot study

Havva-Nur Bayraktar, Joana Rodrigues de Castro, Caroline Poletti, Alix Collard, Florence Dupriez, Bastian Rodrigues de Castro



82 Impact of a cognitive aid on CPR guidelines adherence in a simulation-based setting: A monocentric randomized controlled trial

> Verjans Renaud, Dubois Nadège, Piazza Justine, Failon Gilles, Koeune Clara, Klenkenberg Sophie, Donneau Anne-Françoise, Tubes Rebecca, Ghuysen Alexandre

- 86 How hyperventilation might kill you - A case report Denys Marie-Astrid, Vertriest Céline, Lamont Bart, Bresseleers Jan, Vandeplassche Sophie
- 91 Pericardial tamponade as a rare presentation of lymphoma: A case report

Arnout Lauriks, Van Herck J., Jorens PG

96 Emergency Department management of severe late-onset ovarian hyperstimulation syndrome: Case report

Quentin Paeschen, Laetitia Rousseau, Laurie Henry, Alexandre Ghuysen

Posterior circulation stroke mistriaged as intoxication: A 102 case report

Jasper Tuboville, Koen De Feyter

106 Fatal Sodium Nitrite Poisoning: Do we need prehospital methylene blue?

Orla Braun, Jent Lievers, Marc Sabbe, Cornelia Genbrugge, Ken De Smet

- 109 Hard to be a dick: A rare cause of priapism Jade Vranckx, Gilles Dosin, Fabien Guerisse
- 112 Global trends in prehospital ECPR and alternate delivery strategies: Is there potential in Belgium?

De Smaele Lindsey, Winter Maxine, Peperstraete Harlinde



118 Accessibility and efficacy of the URG Dijon Application: A comprehensive user experience analysis

Ilinca Romocea, Cristian Terec, Matas Giedrius, Patrick Ray

120 Carbon monoxide poisoning by hookah smoking Rhea Colvin, Hiba El banouti



Welcome to the Belgian Society of Emergency and Disaster Medicine BESEDIM - 35th anniversary congress - 2025

The annual congress of the Belgian Society of Emergency & Disaster Medicine brings together all Belgian Emergency physicians. It provides a platform for presenting new research, as well as rare clinical cases. It allows for interdisciplinary discussion, feedback and coaching. Emergency Medicine is a young and growing discipline in many countries, Belgium including. BESEDIM wants to be a driving force. This 35th congress of our society is central to this mission. Each of the abstracts in this book has been presented and discussed during the congress.



Belgian Society of Emergency and Disaster Medicine BESEDIM

LIST OF ORGANIZERS

Belgian Society of Emergency and Disaster Medicine BESEDIM



Venous air embolism mimicking anaphylactic shock after intravenous contrast injection: A case report

Author

De Vos K – Department of Emergency Medicine, Antwerp University Hospital; Faculty of medicine and health sciences, University of Antwerp Janssens E – Department of Emergency Medicine, Antwerp University Hospital; Faculty of medicine and health sciences, University of Antwerp Gevaert A – Faculty of medicine and health sciences, University of Antwerp; Department of cardiology, Antwerp University Hospital De Maeyer C – Department of Emergency Medicine, Antwerp University Hospital Monsieurs K – Department of Emergency Medicine, Antwerp University Hospital; Faculty of medicine and health sciences, University of Antwerp Verdonck P – Department of Emergency Medicine, Antwerp University Hospital; Faculty of medicine and health sciences, University of Antwerp

Citation

De Vos, K., Janssens, E., Gevaert, A., De Maeyer, C., Monsieurs, K., Verdonck, P. Venous air embolism mimicking anaphylactic shock after intravenous contrast injection: A case report.

Introduction

Venous air embolism (VAE) is often iatrogenic and presents with nonspecific symptoms, mimicking other diseases (1). It carries high morbidity and mortality if untreated, necessitating early inclusion in the differential diagnosis. We describe a 68-year-old patient with a VAE post-IV contrast injection.



Setting

A 68-year-old male was admitted for an elective electrical cardioversion and a cardiac computed tomography (CT). For the procedural sedation for the cardioversion, propofol was administered through the vascular device already in situ (port-a-cath in the right subclavian vein). During the same procedure, a planned transesophageal echocardiography showed a structurally normal heart and a normal systolic function. Once the patient woke up, preparations were made to perform the cardiac CT with intravenous contrast, but the venous access needle became dislodged and needed to be replaced. Following intravenous contrast administration, the patient experienced difficulty in breathing, hemodynamic instability and became unconscious.

Shortly after, the patient regained consciousness but difficulty breathing, and hypotension persisted (without tachycardia) despite an IV fluid bolus and high-flow oxygen. No rash or facial/intra-oral edema was observed. Point of care cardiac ultrasound showed acute right ventricular overload and an VAE was suspected clinically. CT of the chest (without contrast) confirmed an air embolism in the truncus pulmonalis. The patient was placed in Trendelenburg position, fluid administration was continued, and intravenous norepinephrine was started. Forty milliliters of air were evacuated through the IV access line. The patient was intubated due to agitation and received urgent hyperbaric oxygen therapy (HBOT) according to US Navy 6 scheme. This consists of a compression phase about 5 minutes to depth of 18msw (meter sea water) under 100% oxygen and 4 oxygen cycles lasting 20 minutes each with short air intervals. Then, the patient is decompressed to about 9msw and exposed to 2 oxygen cycles lasting 60 minutes each and slowly returned to surface pressure. The total elapsed time is about 285min (4hrs. 45min) (1). Post-HBOT cardiac ultrasound showed normal right ventricular function, and the patient was transferred to the intensive care unit for monitoring. He was extubated 18 hours later and discharged to the regular cardiology ward 2 days later. He was discharged 2 days late without any residual complications.

Discussion

VAE, often associated with vascular access devices and intravascular contrast injections, requires prompt diagnosis and treatment to prevent fatal outcomes (2,3). This case underscores the importance of proper vascular



access device usage (4). Clinicians should consider VAE as a potential cause of obstructive shock following procedures involving vascular access (5). In this case mimicking the early stages of anaphylactic shock after IV contrast injection Diagnosis is primarily clinical but can be supported by CT imaging. Initial treatment involves positioning the patient in Trendelenburg position and providing normobaric oxygen therapy. HBOT is indicated for patients with hemodynamic or cardiopulmonary compromise, or evidence of end-organ damage, with urgent referral to a hyperbaric oxygen center recommended when available (5). Although its availability may vary geographically, urgent referral to a hyperbaric oxygen center is recommended if possible.

References

1. Cortegiani A, Foresta G, Strano G, et al. An atypical case of taravana syndrome in a breath-hold underwater fishing champion: a case report. Case Rep Med. 2013;2013:939704. doi:10.1155/2013/939704

2. Mirski MA, Lele AV, Fitzsimmons L, Toung TJ. Diagnosis and treatment of vascular air embolism. Anesthesiology. 2007 Jan;106(1):164-77. doi: 10.1097/00000542-200701000-00026. PMID: 17197859.

3. Goodwin J, Gnanapandithan K. Air embolism after peripheral IV contrast injection. Cleve Clin J Med. 2020 Nov 23;87(12):718-720. doi: 10.3949/ccjm.87a.20001. PMID: 33229386; PMCID: PMC8048767.

4. Campbell J. Recognising air embolism as a complication of vascular access. Br J Nurs. 2014 Jul 24-Aug 13;23(14):S4, S6-8. doi: 10.12968/bjon.2014.23.sup14.s4. PMID: 25158360.

5. Marsh PL, Moore EE, Moore HB, et al. latrogenic air embolism: pathoanatomy, thromboinflammation, endotheliopathy, and therapies [published correction appears in Front Immunol. 2024 Feb 06;15:1378003]. *Front Immunol.* 2023;14:1230049. Published 2023 Sep 19. doi:10.3389/fimmu.2023.1230049



When foot pain conceals a fatal threat: A case of fulminant meningococcemia

Author

Aline Khichen – Service des urgences-Spoedgevallen, Cliniques de l'Europe (Bruxelles) - Europa Ziekenhuizen (Brussel)

Citation

Khichen, A. When foot pain conceals a fatal threat: A case of fulminant meningococcemia.

Introduction

Purpura fulminans (PF) in meningococcemia has a high mortality rate of 40%¹. Its rapid blood proliferation and endotoxin production induce a severe systemic inflammatory response⁴.

For emergency physicians, early diagnosis is crucial for rapid treatment. Although classic clinical signs are recognized, atypical presentations can delay intervention. We discuss a case of a young man who initially came in with foot pain, a common ER complaint and developed fatal meningococcemia within hours.

Case presentation

A 37-year-old man, with no notable medical history, presents with intense pain in his right foot, localized at the hallux metatarsophalangeal (MTP) joint for almost 12 hours. He had chills overnight. His blood pressure is 81/51 mmHg, his heart rate is 115 BPM and his temperature is 37.5°C. Clinically, there is intense pain, a slight erythema with edema and a lesion suggestive



of a bruise on the plantar aspect of the joint. Morphine is necessary. Blood analysis reveal respiratory alkalosis, hyperlactatemia, an elevated CRP, leukopenia, and acute kidney failure. Chest X-ray, ECG, urinary tests, and cardiac ultrasound show no abnormalities. Despite fluid resuscitation and broad-spectrum antibiotics, his condition does not stabilize. The bruise worsens (fig 1A), and the patient is admitted to intensive care, requiring vasopressor support. He develops acute respiratory failure, necessitating mechanical ventilation. Additionally, other disseminated purpuric lesions appear on his extremities (fig 1B). Meningococcemia is suspected, antibiotics are adjusted but the patient enters refractory shock with metabolic acidosis, leading to cardiac arrest 7 hours following his admission to the hospital. Blood cultures later confirmed the presence of Neisseria meningitidis.



1A. Clinical reevaluation one hour after ED admission: multiple small patches of 5mm nonpalpable purpuric erythematous-violaceous spots, centered over the joint area.1B. After ICU admission: progression of the initial skin lesion and appearance of other purpuric lesions on extremities (legs, hands, feet).



Discussion

The meningococcal purpura fulminans, mainly affecting young adults, presents with septic shock associated with rapidly appearing extensive purpura, often with a characteristic hemorrhagic or necrotic progression¹ and acral involvement². The diagnosis is primarily clinical, and antimicrobial treatment, a third-generation cephalosporin, should begin within 30 minutes of suspicion⁴.

The classic skin sign of meningococcemia, which is recognized by most emergency physicians, is the purpuric petechial rash, seen in 40-80% of cases⁴. In the clinical case presented, the skin involvement is atypical, initially manifesting in isolated and asymmetrical manners on the right foot, evolving from erythema to confluent purpuric lesions. Such a presentation is not documented in the literature, although in rare forms, in the early stages of PF, skin lesions can be mistaken for bruises or erythematous macules evolving into irregular central areas of blue-black hemorrhagic necrosis³.

On the other hand, while intense pain in the hallux MTP joint may suggest a classic gout attack, it is important to remember that meningococcemia may present with a flu-like state before the eruption, with intense myalgias in the lower limbs in 35-65% of cases⁴, and arthralgias are also noted. The importance of taking vital signs at emergency triage, even for minor issues like foot pain, is emphasized by this case.

Conclusion

This case highlights the importance of continuous evaluating skin manifestations and reminds us that purpuric lesions can appear in different forms, associated with septic shock should primarily prompt consideration of invasive meningococcal infection.



Belgian Society of Emergency and Disaster Medicine BESEDIM

Références

1. Contou D, De Prost N., Purpura fulminans in adult patients, Méd. Intensive Réa., 2022, 31(2):125-132

2. Pulido-Pérez A, Bergón-Sendín M, Suárez-Fernández R, Muñoz-Martín P, Bouza E, Skin and sepsis: contribution of dermatology to a rapid diagnosis, Infection journal, 2021, 49, 617–629

3. Chalmers E, Cooper P, Forman K, Grimley C, Khair K, Minford A, Morgan M, Mumford AD, Purpura fulminans: recognition, diagnosis and management, Arch Dis Child, 2011, 96(11):1066-71

4. Rodrigo Siqueira B, Gomes AP, Dutra Gazineo JL, Balbino Miguel PS, Santana LA, Oliveira L, Geller M, Meningococcal disease, a clinical and epidemiological review, Asian Pacific Journal of Tropical Medicine, 2017, 10 (11), 1019-1029



Feeling unwell after diving: There's more than meets the eye

Author

Blondeau Loïc, Anseeuw Kurt – Department of Emergency Medicine, ZAS Cadix, Belgium

Citation

Loïc, B., Kurt, A. Feeling unwell after diving: There's more than meets the eye.

Case report

We present the case of a 54-year-old man with a medical history notable for untreated arterial hypertension, sleep apnea, obesity and hyperlipidemia. Following a guided diving session with a maximum depth of 9 meters, he experienced headache, vomiting, and general discomfort. A paramedical intervention team (PIT) was dispatched to provide assistance.

Upon arrival, the patient was awake, seated, and actively vomiting. He had a Glasgow Coma Scale (GCS) score of 15/15 and complained of a headache. However, during transport, his condition deteriorated: his level of consciousness declined, and he developed right-sided hemiparesis and mouth drooping. By the time he reached the hospital, he was unconscious, and anisocoria was noted.

An urgent CT scan (see fig 1) revealed a large left intraparenchymal hemorrhage with ventricular breakthrough. CT angiography showed no evidence of aneurysm or arteriovenous malformation. The patient was intubated, deeply sedated, and underwent urgent placement of a ventriculo-external drain in the operating room.





During his intensive care unit (ICU) stay, the patient required a new drain and intraventricular thrombolysis to address residual intraventricular hematoma. He was extubated after 32 days, with no residual hemiparesis upon waking. However, he exhibited complete amnesia of the event. After 39 days in the ICU, the patient was transferred to the neurology ward for further rehabilitation. At that point, he was awake but exhibited dysphagia and slow speech.

Discussion

Despite increasing safety measures, over 1,000 diving-related injuries are reported annually. Most cases involve barotrauma or decompression sickness. In the described case, decompression sickness is highly unlikely, and there are no indications of typical barotrauma. However, an arterial air embolism—an event that can occur during uncontrolled ascents from as little as 1 meter—should remain on the differential diagnosis. (1)

There are a few reported cases of intracranial hemorrhage associated with diving, but to the best of our knowledge, this is the first describing an intraparenchymal hemorrhage. (2)(3) We hypothesize that the hemorrhage was precipitated by uncontrolled hypertension, exacerbated by the dive itself. (4) Immersion in cold water induces central pooling of blood, leading to increased central blood pressure. Additionally, the fluid shift from the extremities to the central core further elevates central pressure, compounded by the rise in blood pressure from physical exertion.



Moreover, it is well-documented that intracranial blood flow velocities are elevated during diving. (5) The potential relationship between these augmented velocities and intracranial hemorrhages remains unclear and warrants further investigation.

Conclusion

Our case, along with several others reported in the literature, highlights that intracranial hemorrhages can be a potential cause of medical deterioration following diving. For emergency physicians, it is crucial to conduct a thorough evaluation of the patient and maintain a broad differential diagnosis, rather than hastily resorting to hyperbaric oxygen therapy for diving-related injuries.

References

(1) Newton, H B. "Neurologic complications of scuba diving." American family physician vol. 63,11 (2001): 2211-8.

(2) Kohshi, Kiyotaka et al. "Cerebrospinal vascular diseases misdiagnosed as decompression illness: the importance of considering other neurological diagnoses." Undersea & hyperbaric medicine : journal of the Undersea and Hyperbaric Medical Society, Inc vol. 44,4 (2017): 309-313. doi:10.22462/7.8.2017.2

(3) Piper, Keaton et al. "Nonaneurysmal Subarachnoid Hemorrhage in Scuba Diving." World neurosurgery vol. 141 (2020): 153-156. doi:10.1016/j. wneu.2020.06.030

(4) Westerweel, Peter E et al. "Diving with hypertension and antihypertensive drugs." Diving and hyperbaric medicine vol. 50,1 (2020): 49-53. doi:10.28920/dhm50.1.49-53

(5) Barak, O F et al. "Elevations in Intra-cranial blood flow velocities following a SCUBA Dive and the Influence of Post-dive Exercise." International journal of sports medicine vol. 37,8 (2016): 591-7. doi:10.1055/s-0042-103589



Sodium nitrite toxicity: A walk in the park?

Author

Charlotte Faes, Alexander Vermassen, Nele Vereycken, Hannelore Raemen – Department of Emergency Medicine, ZAS Middelheim Hospital, Antwerp, Belgium

Citation

Faes, C., Vermassen, A., Vereycken, V., Raemen, H. Sodium nitrite toxicity: A walk in the park?

Introduction

This case reports a fatal sodium nitrite (NaNO₂) ingestion despite optimal prehospital care, highlighting evidence on early antidote use.

Case report

A 22-year-old patient was found in cardiac arrest with agonal breathing in a park near the hospital. On arrival, basic life support (BLS) was ongoing, and advanced life support (ALS) measures, including intubation, mechanical cardiopulmonary resuscitation (CPR), IV access, and epinephrine administration, were initiated. The patient was rapidly transported to the emergency department (ED) for potential extracorporeal life support (ECLS).

At the ED, the patient displayed gray discoloration of the skin and cyanosis, raising suspicion for methemoglobinemia. A chocolate-brown arterial sample was drawn, showing methemoglobin levels exceeding 30% (Fig. 1). After 50 minutes without circulation, resuscitation was terminated. ECLS was deemed unsuitable due to the prolonged hypoxic period.



	antericei		
FIO2 bloedgas	100,00		%
U Temperatuur	37,0		°C
pH bloedgas (art.)	6,91	7,35 - 7,45	
pCO2 bloedgas (art.)	34	32 - 45	mm Hg
pO2 bloedgas (art.)	218	83 - 108	mm Hg
Totale CO2 bloedgas (art.)	7,8	19,0 - 24,0	mmol/L
Base overmaat bloedgas (art.)	-25,7	-2,0 - 3,0	mmol/L
O2 saturatie gemeten bloedgas (art.)	58,6	94,0 - 98,0	%
 Lactaat bloedgas (art.) 	>20,0	0,5 - 1,6	mmol/L
pH (temp. correctie)	6,91	7,35 - 7,45	
pCO2 (temp. correctie)	34,0	32,0 - 45,0	mm Hg
pO2 (temp. correctie)	218,0	80,0 - 104,0	mm Hg
pO2/FiO2 bloedgas	218	1	mm Hg
Actuele bicarbonaat bloedgas	6,8	22,0 - 26,0	mmol/L
Hemoglobine bloedgas	16,80	11,00 - 14,40	g/dL
Hematocriet bloedgas	42,0	100000000000000000000000000000000000000	%
CO-hemoglobine bloedgas	0,4	1,0 - 3,0	%
Methemoglobine bloedgas	> 30,0	0,0 - 1,5	%
Natrium bloedgas	143	136 - 145	mmol/L
Kalium bloedgas	6,7	3,4 - 4,4	mmol/L
Chloride bloedgas	106	98 - 106	mmol/L
Glucose bloedgas	433	67 - 90	mg/dL
Geioniseerde calcium (gemeten)	1,15	1,15 - 1,27	mmol/L
Anion-gap bloedgas	37	10 - 18	mEq/L

Discussion

 $NaNO_2$ ingestion is an emerging suicide method increasingly reported in literature and clinical practice (1). Commonly used in meat curing and laboratories, $NaNO_2$ oxidizes ferrous (Fe²⁺) iron in hemoglobin to ferric (Fe³⁺) iron, forming methemoglobin. This disrupts oxygen transport by reducing hemoglobin's oxygen-carrying capacity and shifting the oxygen dissociation curve, leading to systemic hypoxia.

The estimated lethal dose of $NaNO_2$ is 0.7 to 6 g (approximately one teaspoon). It can easily and cheaply be bought online in 100 g packages, heightening the risk of misuse (2). Clinically, $NaNO_2$ poisoning should be suspected in patients presenting with chocolate-brown colored blood,



hypoxemia unresponsive to oxygen and cardiac arrest of suspected toxicological origin.

The mainstay of treatment for methemoglobinemia is methylene blue, administered at 1-2 mg/kg over five minutes, with repeat doses if needed. Total doses exceeding 7 mg/kg should be avoided due to the risk of hemolysis. Methylene blue acts by catalyzing the reduction of methemoglobin to hemoglobin via NADPH-methemoglobin reductase (Fig. 2) (3).

Case reports indicate that fatalities often result from delayed methylene blue administration, frequently initiated only after ED arrival and cardiac arrest. There are no reports of survival with methylene blue administration after cardiac arrest has occured. However, two cases of intentional NaNO₂ overdose with severe methemoglobinemia showed favourable outcomes (4) (5). One patient, with a methemoglobin level of 71%, survived due to early recognition, rapid ED notification, and prompt methylene blue therapy. These examples highlight the importance of early diagnosis, aggressive management, and immediate intervention in preventing fatalities.

The effectiveness of methylene blue in low blood flow states like cardiac arrest remains unclear, and alternative treatments such as exchange transfusion, hyperbaric oxygen and extracorporeal membrane oxygenation (ECMO) lack evidence.





Conclusion

Prehospital and emergency physicians must be vigilant about the rising use of NaNO₂ for suicide, recognizing signs of severe methemoglobin toxicity and implementing prompt treatment. Managing these cases is far from a "walk in a park", but prevention of cardiac arrest through early methylene blue administration and adequate oxygenation and ventilation remains crucial. ED's should ensure an adequate supply of methylene blue and consider equipping prehospital teams with this antidote to improve outcomes, particularly in young, severely intoxicated patients.

References

1. Neth MR, Love JS, Horowitz BZ, Shertz MD, Sahni R, Daya MR. Fatal Sodium Nitrite Poisoning: Key Considerations for Prehospital Providers. Prehospital Emerg care. 2021;25(6):844–50.

2. Antonides. Natriumnitriet [Internet]. Available from: https://antonides. com/products/natriumnitriet-p-a?srsltid=AfmBOorSZa5YeuXdPmDteRhE-TYZWJuytDUH9k9c0OsWevn6CjNC0ohu

3. Pushparajah Mak RS, Liebelt EL. Methylene Blue: An Antidote for Methemoglobinemia and Beyond. Pediatr Emerg Care. 2021 Sep;37(9):474–7.

4. Matin AM, Boie ET, Moore GP. Survival after self-poisoning with sodium nitrite: A case report. Vol. 3, Journal of the American College of Emergency Physicians open. United States; 2022. p. e12702.

5. Ehlers P, Bryant SM. Immediate methylene blue is critical for sodium nitrite ingestions. Vol. 68, The American journal of emergency medicine. United States; 2023. p. 186.



Respiratory diphteria in a 16-yearold who developed multiple lifethreatening complications

Author

Genot Juliette, Thomas Boisdenghien, Mahmoud Kaabour, Axel Derwa, Sergio Rizzi, Marie Belleflamme – Emergency Department, Clinic Saint-Jean, Boulevard du Jardin Botanique, 32, 1000 Bruxelles, Belgique

Citation

Juliette, G., Boisdenghien, T., Kaabour, M., Derwa, A., Rizzi, S., Belleflamm, M. Respiratory diphteria in a 16-year-old who developed multiple life-threatening complications.

Introduction

Diphtheria, caused by *Corynebacterium diphtheriae*, is a serious infectious disease associated with high mortality (10%). Its virulence lies in the production of diphtheria toxin, which inhibits protein synthesis, leading to cellular degeneration and necrosis². While global vaccine coverage has significantly reduced prevalence, sporadic cases are re-emerging in Europe due to immigration from regions with suboptimal vaccination rates. The treatment lies on early immunoglobulin treatment and antibiotic therapy, usually combining a macrolide and penicillin G.

Clinical presentation

A 16-year-old Afghan male presented to the emergency department with odynophagia and respiratory congestion. Despite stable vital signs, physical examination revealed pseudomembranes, bilateral cervical lymphadenopathy ("bull neck"), and mild oxygen desaturation. Initial workup confirmed



diphtheria via PCR from an oropharyngeal swab. Intravenous penicillin G and erythromycin were initiated.

Overnight, the patient developed acute respiratory distress requiring urgent intubation. Anti-diphtheria immunoglobulins (100,000 U) were administered.

On day five, he developed supraventricular tachycardia, progressing to complete atrioventricular block (figure 1) necessitating the use of amiodarone and vasopressors.



FIGURE 1

Arrhythmia in diphtheritic myocarditis. Visual representation demonstrating the temporal evolution of the patient's electrocardiogram with myocarditis. Initially, there is evidence of first-degree atrioventricular block concomitant with de novo left bundle branch block. Subsequent electrocardiograms, obtained over the course of several days, reveal a progression to complete atrioventricular block, culminating in profound bradycardia and eventual asystole.





By day 7th, the patient developed complete atrioventricular block requiring isoprenaline infusion, and by day 14th, severe bradycardia progressed to asystole, necessitating CPR with successful ROSC. Temporary transvenous pacing and ECMO were initiated for stabilization.

Neurological complications, including left hemineglect and paraparesis, emerged post-ECMO, with MRI revealing two lacunar ischemic lesions (figure 2).

Following intensive care and rehabilitation, the patient was discharged with reduced left ventricular ejection fraction (35%). At the one-year follow-up, significant neurological and cardiac recovery was observed, with an ejection fraction of 50% despite residual septal dyskinesia.



Discussion

The resurgence of diphtheria in Europe highlights the importance of considering this diagnosis, especially in migrants from endemic regions. Comprehensive evaluation of respiratory symptoms in such patients should include bacterial and viral cultures and vaccination status. The hallmark pseudomembranes and bull neck warrant rapid airway management, often requiring intubation or tracheostomy based on clinical expertise¹.

Diphtheria toxin's systemic effects cause significant complications. Early immunoglobulin administration is critical to neutralize the toxin before cellular binding, reducing severe outcomes like myocarditis and neurological damage². In this case, delays in antitoxin availability were deleterious, underscoring the need for improved resource allocation.

Cardiac complications, including myocarditis and arrhythmias, occur in up to 20% of cases, with mortality rates reaching 70%. Our patient developed tachycardia-induced cardiomyopathy and complete heart block. Stabilization with ECMO and subsequent permanent pacemaker implantation allowed recovery, aligning with recent evidence supporting pacemaker use in severe cases³.

Neurological manifestations, including polyneuropathy and encephalitis, are rare but serious⁴. In this case, MRI findings suggested central nervous system involvement, although the role of ECMO or other interventions cannot be excluded. Such complications underscore the complexity of diphtheria management, requiring multidisciplinary care.

Conclusion

This case illustrates the systemic impact of respiratory diphtheria and the critical need for early recognition and comprehensive management. Timely immunoglobulin and antibiotic therapy, alongside vigilant monitoring for complications, are paramount. The resurgence of diphtheria in developed countries calls for heightened awareness among healthcare providers and improved vaccination strategies, particularly for migrant populations.



Belgian Society of Emergency and Disaster Medicine BESEDIM

Bibliography

1. Nair RR, Joseph TP. Nasotracheal intubation in diphtheria. Journal of Pediatric Surgery. 1975;10(2):201-2.

2. Luis F Barroso MSP, MD, FACP. Clinical manifestations, diagnosis, and treatment of diphtheria: Uptodate; Feb 21 2020 [Available from: https://www.uptodate.com/contents/clinical-manifestations-diagnosis-and-treatment-of-diphtheria.

3. Samdani S, Jain A, Meena V, Meena CB. Cardiac complications in diphtheria and predictors of outcomes. International Journal of Pediatric Otorhinolaryngology. 2018;104:76-8.

4. Prasad PL, Rai PL. Prospective Study of Diphtheria for Neurological Complications. J Pediatr Neurosci. 2018;13(3):313-6



Kearns-Sayre Syndrome: Case presentation and literature review of high-risk features suggestive of cardiac syncope in the Emergency Department

Author

Julien Higny* – Department of Cardiovascular Disease, CHU UCL Namur, B-5530 Yvoir, Belgium Francis Ntwali – Department of Intensive Care Medicine, CHU UCL Namur, B-5500 Dinant, Belgium Marco Natile – Department of Intensive Care Medicine, CHU UCL Namur, B-5500 Dinant, Belgium Pierre-Yves Henin – Department of Intensive Care Medicine, CHU UCL Namur, B-5500 Dinant, Belgium Nicolas Moreau – Department of Intensive Care Medicine, CHU UCL Namur, B-5500 Dinant, Belgium Frédéric Forêt – Department of Intensive Care Medicine, CHU UCL Namur, B-5500 Dinant, Belgium Martin Benoît – Department of Cardiovascular Disease, CHU UCL Namur, B-5530 Yvoir, Belgium

Citation

Higny, Julien., Ntwali, F., Natile, M., Henin, P-Y., Moreau, N., Forê, F., Benoît, M. Kearns-Sayre Syndrome: Case presentation and literature review of high-risk features suggestive of cardiac syncope in the Emergency Department.



Introduction

Early recognition and management of true syncope in the Emergency Department (ED) remain challenging. Kearns-Sayre Syndrome is a rare mitochondrial cytopathy responsible for neuromuscular disorders and cardiac dysfunction at precocious age. This case report illustrates that Kearns-Sayre Syndrome is the differential diagnosis in a young patient admitted to the ED with recurrent syncope and cardiac conduction disorders. In addition, we sought to remind the 2018 European Society of Cardiology (ESC) Guidelines for the Diagnosis and Management of Syncope.

Case presentation

A 17-year-old patient was admitted to our ED for a traumatic syncope complicated with head injury during cycling exertion (Figure 1A). Particularly, the patient consulted the emergency room 48 hours earlier for a wrist trauma after fainting in unclear circumstances (Figure 1B). On admission, the pulse rate was 45 bpm and the blood pressure was 90/60 mmHg. Immediate



FIGURE 1

- A. The patient was admitted to our emergency department for a traumatic syncope complicated with head injury during cycling exertion.

- **B.** The patient was previously admitted to our emergency department for a wrist trauma after fainting in unclear circumstances.

- C. Clinical manifestations of the Kearns-Sayre Syndrome include bilateral ptosis and external ophthalmoplegia.





ECG monitoring was performed because of the suspicion of arrhythmic syncope. The first ECG demonstrated a complete heart block (Figure 2A). A dual-chamber pacemaker was implanted in emergency (Figure 2B). Interestingly, physical examination revealed a bilateral ptosis with external



ophthalmoplegia (Figure 1C). Medical history included moderate cognitive impairment. A previous ECG recorded in the database showed a bifascicular block (Figure 2C).

Discussion

As described in the 2018 ESC Guidelines for the Diagnosis and Management of Syncope, clinical features suggestive of cardiac syncope include faintness during exertion or when supine and sudden onset palpitation immediately followed by syncope. Regarding electrocardiographic findings, arrhythmic syncope is highly probable when ECG shows the following characteristics: persistent sinus bradycardia <40 bpm or sinus pauses >3 sec in awake state and in absence of physical training, bifascicular block, QRS duration >0.12 sec, 1st degree AV block with markedly prolonged PR interval, Mobitz I second-degree AV block, Mobitz II second- and third-degree AV block, alternating left and right bundle branch block, ventricular tachycardia or rapid paroxysmal supraventricular tachycardia, pre-excited QRS complexes, long or short QT intervals, early repolarization, Brugada pattern, negative T waves in right precordial leads with epsilon waves suggestive of arrhythmogenic right ventricular cardiomyopathy, and left ventricular hypertrophy suggesting hypertrophic cardiomyopathy. In this context, any high-risk features require an intensive diagnostic approach and should not be discharged from the ED [1].

earns-Sayre Syndrome is a rare mitochondrial cytopathy responsible for neuromuscular disorders. Clinical manifestations include bilateral ptosis, external ophthalmoplegia, pigmentary retinopathy, muscle weakness, developmental delay and cardiac conduction defects. Cardiac manifestations may include intraventricular conduction delays, fascicular blocks, thirddegree AV block, prolonged QT interval and ventricular tachyarrhythmia responsible for syncope, heart failure and cardiac arrest [2,3].

Conclusion

In this clinical case, we sought to remind that Kearns-Sayre Syndrome is the differential diagnosis in a young patient with recurrent syncope and cardiac conduction disorders. In accordance with the ESC Clinical Practice



Guidelines, we also described high-risk features that suggest a serious condition in patients with syncopal event. We expect that this article will help to increase awareness for the management of patients with transient loss of consciousness at initial evaluation in the Emergency Department.

References

1. 2018 ESC Guidelines for the diagnosis and management of syncope, European Heart Journal, Vol 39, Issue21, 01 June 2018, Pages 1883 -1948, https://doi.org/10.1093/eurheartj/ehy037.

2. Gobu P, Karthikeyan B, Prasath A, Santhosh S, Balachander J. Kearns Sayre Syndrome (KSS) - A Rare Cause For Cardiac Pacing. Indian Pacing Electrophysiol J. 2011 Feb 7;10(12):547-50. PMID: 21346823; PMCID: PMC3034457.

3. Kabunga P, Lau AK, Phan K, Puranik R, Liang C, Davis RL, Sue CM, Sy RW. Systematic review of cardiac electrical disease in Kearns-Sayre syndrome and mitochondrial cytopathy. Int J Cardiol. 2015 Feb 15;181:303-10. doi: 10.1016/j.ijcard.2014.12.038. Epub 2014 Dec 13. PMID: 25540845.



Superior vena cava syndrome – case report

Author

Joke Baeyens, Lieselot Blomme, Ives Hubloue – Emergency medicine, UZ Brussel

Citation

Baeyens, J., Blomme, L., Hubloue, I. Superior vena cava syndrome – case report.

Introduction

Superior vena cava syndrome (SVCS) is caused by obstruction of the superior vena cava (SVC). This can be due to external compression or invasion by a malignancy, or because of a thrombus. (1,2,3) In about 70%, the SVCS is caused by a malignancy (non-small cell lung cancer, small cell lung cancer or non-Hodgkin lymphoma). In 30% of cases, the cause is benign, mostly thrombosis caused by implanted devices e.g. pacemaker leads or central port catheters. (1,3) Patients present with variable symptoms, such as facial edema, non-pulsatile distended neck veins, distended chest veins, dyspnea and cough, arm edema, hoarseness and/or stridor, syncope and/ or headache, confusion, obtundation. (1,2) The diagnosis is made based on clinical presentation and imaging. (1)

Treatment consists of supportive measures and clearing the obstruction. Possible modalities are chemotherapy, radiotherapy, surgical bypass, endovascular treatment (stenting, thrombectomy, thrombolysis)... (1,2,4)

Clinical case

A 76-year-old man presented at the emergency department for respiratory distress. He had a medical history of non-Hodgkin lymphoma in remission. He had been experiencing dizziness, and a redness and swelling of his face and arms since a couple of days, for which he had already presented



at the emergency department a first time. At that point, the symptoms were thought to be a reaction to a treatment started a few days earlier for recurrent urinary tract infections (Tamsulosine and Solifenacine).

That morning, he presented himself for the second time after he woke up with shortness of breath. Driving to the hospital became too difficult, so he called an ambulance. He received Pulmicort- and Adrenaline aerosols and oxygen through an Oxymask. Upon arrival at the emergency department, he became tachypneic and stridorous, and he was sedated and an endotracheal tube was placed. No hemodynamic support was needed and FiO2 could be reduced rapidly after intubation. Upon placing a right internal jugular central catheter, a blood clot was aspirated. CT imaging showed thrombosis in the SVC around the tip of his central port catheter, expanding in the left brachiocephalic vein, left subclavian vein, proximal left axillary vein and left internal jugular vein with oedema of the neck and larynx.

The patient was admitted to intensive care and treated with unfractionated heparine. During his ICU-stay, on-table thrombolysis was performed by the vascular surgeons, and in situ thrombolysis was continued. His central port catheter was removed and a stent was placed in the superior vena cava. The patient was weaned and taken off mechanical ventilation on day seven and on the tenth day he was transferred to the hematology ward. Anticoagulation was continued orally by DOAC.

Discussion

This patient presented earlier with symptoms that could fit the diagnosis of SVCS, which were attributed to a drug reaction. This probable initial missed diagnosis caused the symptoms to evolve to a life-threatening grade IV SVCS.

Through this case report we want to emphasize the importance of a high index of suspicion for SVCS in patients with intravascular devices.



Belgian Society of Emergency and Disaster Medicine BESEDIM

References

1. Azizi AH, Shafi I, Shah N, Rosenfield K, Schainfeld R, Sista A, Bashir R. Superior Vena Cava Syndrome. JACC Cardiovasc Interv. 2020 Dec 28;13(24):2896-2910. doi: 10.1016/j.jcin.2020.08.038. PMID: 33357528.

2. James B. Yu, Lynn D. Wilson, Frank C. Detterbeck, Superior Vena Cava Syndrome—A Proposed Classification System and Algorithm for Management, Journal of Thoracic Oncology, Volume 3, Issue 8, 2008, Pages 811-814, ISSN 1556-0864, https://doi.org/10.1097/JTO.0b013e3181804791.

3. Khan UA, Shanholtz CB, McCurdy MT. Oncologic Mechanical Emergencies. Hematol Oncol Clin North Am. 2017 Dec;31(6):927-940. doi: 10.1016/j.hoc.2017.08.001. PMID: 29078930.

4. Kalra M, Sen I, Gloviczki P. Endovenous and Operative Treatment of Superior Vena Cava Syndrome. Surg Clin North Am. 2018 Apr;98(2):321-335. doi: 10.1016/j.suc.2017.11.013. PMID: 29502774.


Marian Thistle Poisoning at the Sint Maria hospital: A case report

Author

Niens, Iris – AZ Sint Maria Halle – Ziekenhuislaan 100, 1500 Halle Haest, Elke – AZ Sint Maria Halle – Ziekenhuislaan 100, 1500 Halle Vermeersch, Nick – AZ Sint Maria Halle – Ziekenhuislaan 100, 1500 Halle De Rouck, Ruben – AZ Sint Maria Halle – Ziekenhuislaan 100, 1500 Halle; ReGEDiM -Vrije Universiteit Brussel – Laarbeeklaan 103 – 1090 Brussel

Citation

Iris, N., Elke, H., Nick, V., Ruben, D.R. Marian Thistle Poisoning at the Sint Maria hospital: A case report.

Introduction

Herbal supplements are commonly perceived as harmless or "natural" by patients and are frequently underreported during clinical assessments. In reality, these preparations can cause significant toxicity, even at recommended doses. This case highlights the importance of vigilant history-taking and awareness of potential adverse effects of herbal products in the emergency department (ED).

Setting

A 65-year-old woman was transported to the ED via a mobile emergency medical team (MMT) after experiencing syncope with prodromal symptoms during defecation. Vital signs and ECG were within normal limits upon MMT arrival. A thorough medication history, taken at hospital admission, revealed recent initiation (1 week prior) of Marian thistle (Silybum marianum, also called Milk Thistle, see figure 1) extract at the recommended dose of 20 drops 3 times per day to "detox her liver".



Results

Physical examination, laboratory tests (including blood gas analysis), and imaging studies (chest and abdominal radiographs) were within normal limits. The patient's symptoms—nausea, vomiting, and abdominal cramps improved during a 4-hour observation period. Consultation with the National Poison Center confirmed that Marian thistle can produce gastroenteritis-like side effects, advising close monitoring for fluid or electrolyte imbalances. The patient was discharged after symptom resolution.

Discussion

Marian thistle contains silymarin, often cited for its hepatoprotective properties and used in amatoxin poisoning. However, clinical evidence for its use outside this indication is lacking [1,2]. This case underscores the crucial lesson that herbal supplements can cause clinically significant effects even at standard doses. Patients may or may not routinely report such supplements unless specifically asked. Targeted history-taking and prompt consultation with toxicology resources are essential for optimal care in the ED.







Belgian Society of Emergency and Disaster Medicine BESEDIM

References

1. Tamayo C, Diamond S. (2007). Review of clinical trials evaluating safety and efficacy of milk thistle (Silybum marianum [L.] Gaertn.). *Integrative Cancer Therapies*, 6(2), 146–157.

2. Soleimani V, Delghandi PS, Moallem SA, Karimi G. (2019). Safety and toxicity of silymarin, the major constituent of milk thistle extract: An updated review. *Phytotherapy Research*, *33*(6), 1627–1638.



Lateral canthotomy and cantholysis post blepharoplasty – case report

Author

Joke Baeyens – Emergency medicine, UZ Brussel Paul Cardon – Ophthalmology, UZ Brussel Evert Verhoeven – Emergency medicine, UZ Brussel Ives Hubloue – Emergency medicine, UZ Brussel

Citation

Baeyens, J., Cardon, P., Verhoeven, E., Hubloue, I. Lateral canthotomy and cantholysis post blepharoplasty – case report.

Clinical case

A 37-year-old woman presented at the emergency department at night for pain and swelling of the right eye. Earlier that day, she underwent bilateral blepharoplasty and rhinoplasty. Surgery went well and there were no immediate complications. Back home, swelling increased and she felt an increasing pressure in the right eye. In the evening, she couldn't open her eye anymore and later on she started vomiting multiple times. At the emergency department, we noticed severe swelling of the eyelids with proptosis and an eversion of the upper eyelid (image 1a). The pupil was dilated an unresponsive to light. The patient could only distinguish a light in de the distance trough her right eye. The on call ophthalmologist was contacted. While he was on his way to the hospital, the patient underwent a CT scan. Imaging showed a retrobulbar bleed in the right eye (image 2). Lateral canthotomy with cantholysis was performed in the emergency department. Thirty minutes later, the patients visual acuity started improving. A that point





she was able to count fingers from a 50cm distance, but a relative afferent pupillary defect (RAPD) was present. The first intra-ocular pressure measured was 40mmHg, decreasing progressively during the following hour. Oral treatment by acetazolamide was started and continued the following days. In the morning, the patient had a visual acuity of 2/10, without RAPD. During the next week her visual acuity improved to 9/10 without glasses.



Discussion

Orbital compartment syndrome (OCS) is an ophthalmological emergency which can lead to permanent blindness. Increased intra-orbital pressure can be caused by haemorrhagic (e.g. retrobulbar haemorrhage) and nonhaemorrhagic processes. Elevated tension can lead to proptosis and traction on the optic nerve. Optic nerve ischemia can develop rapidly, the pressure inside the orbital compartment should ideally be released within two hours of presentation. (1)

A lateral canthotomy with cantholysis is a procedure designed to release the pressure within the closed orbital compartment in case of an orbital compartment syndrome. Lateral canthotomy is not performed often at the emergency department. It is perceived as an invasive procedure and the threshold to perform it, is relatively high. However, if performed in time, it can prevent permanent vision loss. (1)

The incidence of retrobulbar haemorrhage post blepharoplasty is 0.055%. (2) In this case a CT-scan was performed to confirm the diagnosis, which delayed the treatment for approximately fifteen minutes. Orbital compartment syndrome is a clinical diagnosis. When in doubt: perform a lateral canthotomy.

Literature

1) Desai NM, Shah SU. Lateral Orbital Canthotomy. 2023 Jul 25. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 32491408.

2) Hass AN, Penne RB, Stefanyszyn MA, Flanagan JC. Incidence of postblepharoplasty orbital hemorrhage and associated visual loss. Ophthalmic Plast Reconstr Surg. 2004 Nov;20(6):426-32. doi: 10.1097/01. iop.0000143711.48389.c5. Erratum in: Ophthal Plast Reconstr Surg. 2005 Mar;21(2):169. PMID: 15599241.



Tick-borne encephalitis: To vaccinate or not to vaccinate -A case report

Author

Tine Anthierens – emergency medicine, UZ Brussel Marc Bourgeois – intensive care unit, AZ Sint-Jan Brugge Ives Hubloue – emergency medicine, UZ Brussel

Citation

Anthierens, T., Bourgeois, M., Hubloue, I. Tick-borne encephalitis: To vaccinate or not to vaccinate - A case report.

Introduction

Tick-borne encephalitis (TBE) is a rare viral infection affecting the central nervous system, without any targeted therapy. It can be transmitted through tick bites or alimentary through the consumption of unpasteurised (goat) milk (1-3). Prevention through vaccination and by avoiding tick bites are crucial (1, 2).

Case presentation

This case involves a young Caucasian woman with no prior medical history who developed TBE. She presented with severe headache, vomiting and photophobia 12 days after a camping trip to the Black Forest, Germany. She had been bitten by a tick on her right thigh, which remained attached for over 24 hours without causing a local reaction.

A computed tomography scan of her head revealed no abnormalities, but a lumbar puncture showed elevated white blood cells, low glucose and high lactate levels, suggesting meningitis. Empirical treatment with Ceftriaxone,





Acyclovir and Amoxicillin was initiated. Acyclovir was discontinued after negative herpes tests.

Despite continued antibiotics, her condition worsened to meningoencephalitis. She developed fever, severe neck pain and sensory deficits in the right upper limb and face. She rapidly deteriorated into a stuporous quadriparesis, particularly affecting her upper limbs, more on the right side, as well as a right-sided diaphragmatic paresis, difficulty swallowing and loss of cervical muscle tonus. Eventually she required intubation due to respiratory failure.

Ultimately, Flavivirus antibodies were detected in the cerebrospinal fluid, while other viral encephalitides were excluded. Antibiotics were continued in case of bacterial co-infection, as serology for pathogens like Borrelia may take weeks to confirm.

Four weeks after symptom onset, magnetic resonance imaging of the brain and cervical spine showed no abnormalities.

She gradually recovered over the next few months, regaining full strength in her lower limbs as well as the ability to swallow and speak. However, significant motor deficits persisted in her (proximal) upper limbs and cervical muscles, along with residual right diaphragmatic paresis.

She was transferred to a rehabilitation facility, still requiring a tracheal cannula due to limited lung capacity.

Discussion

Three causative TBE-virus subtypes (from the Flavivirus family) are linked to geographic regions: European, Siberian and Eastern subtypes. Tick-borne transmission is most common in summer. Diagnosis is confirmed through detection of specific viral antibodies in serum or cerebrospinal fluid (1-3).



Clinical manifestations of TBE range from asymptomatic to temporary meningitis to severe meningoencephalomyelitis with flaccid paralysis. Up to half of the patients experience incomplete recovery (2).

There is no specific antiviral therapy and therefore treatment is mainly supportive (2, 3).

High-dose corticosteroids remain controversial in the absence of cerebral edema due to limited evidence.

Conclusion

Given the severity of TBE, the absence of effective antiviral treatment and the risk of incomplete recovery, vaccination should be considered for those traveling to endemic areas (1, 4). This case also highlights the importance of travel history and early diagnosis in the emergency department, to start early with supportive care and lowering the disease's impact.

References

(1) Uptodate: Arthropod-borne encephalitis, consulted on 11 december 2024 https://www.uptodate.com/contents/arthropod-borne-encephalitides

(2) Chiffi G, Grandgirard D, Leib SL et al. Tick-borne encephalitis: A comprehensive review of the epidemiology, virology, and clinical picture. Rev Med Virol. 2023; 33; e2470

(3) Lindquist L, Vapalahti O. Tick-borne encephalitis. The Lancet. 2008;371:1861-1871

(4) Uptodate: Immunizations for travel, consulted on 11 december 2024 https://www.uptodate.com/contents/immunizations-for-travel?search=immunizations%20for%20travel&source=search_result&selectedTitle=1%7E150&usage_type=default&display_rank=1



Coronavirus-induced vulvar aphthosis - A case report

Author

Tine Anthierens, Simon Scheyltjens – both from department of emergency medicine, UZ Brussel

Citation

Anthierens, T., Scheyltjens, S. Coronavirus-induced vulvar aphthosis - A case report.

Introduction

Acute vulvar aphthous ulcers can have various etiologies: two-third are sexually transmitted diseases (STDs), other etiologies are auto-immune diseases or Lipschütz ulcers (1, 2). Lipschütz ulcers are a form of non-specific localized vasculitis reactive to a systemic illness such as Epstein-Barr virus, cytomegalovirus or mycoplasma pneumoniae (1). This case report highlights a new etiology of Lipschütz ulcers: Coronavirus disease 19 (COVID-19).

Case presentation

A twenty-one-year-old Caucasian woman with an otherwise unremarkable medical history presented at the emergency department with severe burning pain in the vulvar region and flu-like symptoms. She tested positive for SARS-CoV-2 six days prior. Her clinical presentation included normal parameters besides tachycardia, oral aphthosis, dry cough and fever. The burning vulvar pain, distinct from typical urinary tract infection pain, was exacerbated immediately after urination.





The patient had recently undergone STD-testing after unprotected sexual intercourse, which was negative except for a mild Candida albicans infection. Please note that Chlamydia was not tested in this case and could also give genital aphthosis. Empirical treatment with Azithromycin was initiated prior to her emergency visit. Clinical examination revealed painful, asymmetrical vulvar ulcers covered with fibrin, without vesicles or bullae (see figure 1). Laboratory tests showed no significant abnormalities and the urine analysis indicated minimal hematuria and leukocyturia, but no bacterial or yeast pathogens.



The patient was managed with oral and topical analgesics including ice, Chamomile sitz baths and Xylocaine gel. While spontaneous resolution is typical, topical corticosteroids were applied along with a one-time dose of Fluconazole for Candida treatment.

At a follow-up visit two weeks later, the vulvar ulcers had substantially improved, and pain had resolved. Systemic investigations did not reveal any autoimmune or other systemic disorders.

Discussion

COVID-19, caused by the SARS-CoV-2 virus, is associated with a spectrum of systemic symptoms including fever, cough, and myalgia. Recent observations suggest that it may also precipitate localized inflammatory responses, including vulvar aphthous ulcers. Lipschütz ulcers are infrequently observed and predominantly affect sexually inactive young women, typically between eight and twenty years of age (1, 2). These ulcers manifest as painful, necrotic lesions on the vulva or vagina, often following systemic viral infections. They are well-demarcated and typically show a 'kissing-pattern', meaning the ulcers tend to have a symmetrical appearance (1). The diagnosis of Lipschütz ulcers is primarily clinical, after excluding other potential causes such as STDs, Crohn's disease, Behçet's disease, fixed drug reactions and malignancies (1, 2).

Lipschütz ulcers are mostly self-limiting after two to three weeks (principally without scarring) and therapy is symptomatic (1, 2). The therapeutic role of corticosteroids (topical or systemic) is debated, with some studies indicating efficacy in reducing pain and ulcer duration (2).

Conclusion

Lipschütz ulcers should be diagnosed by exclusion, particularly after ruling out common infectious causes such as STDs, auto-immune diseases and fixed drug reactions.



The pathogenesis is still not completely understood. The potential association with COVID-19 underscores the importance of considering emerging systemic infections as triggers for localized inflammatory pathologies.

Management should focus on symptomatic relief, with corticosteroids potentially playing a role in reducing inflammation and pain.

References

(1) Uptodate: Acute genital ulceration (Lipschütz ulcer), consulted on 12 november 2024 https://www.uptodate.com/contents/acute-genital-ulceration-lipschutz-ulcer#H118983

(2) Vismara SA, Lava SAG, Kottanattu L, Simonetti GD, Zgraggen L, Clericetti CM et al. Lipschütz acute vulvar ulcer: a systematic review. European journal of pediatrics. 2020;179:1559-1567.



To PEP or not to PEP; A retrospective analysis of (non) occupational post-exposure prophylaxis cases reported in the emergency department in order to refine the local treatment algorithm

Author

Liesbeth Deroose, Bram Depelseneer, Nick Cleymans, Tania Desmet – Ghent university hospital - Emergency Department

Citation

Deroose, L., Depelseneer, B., Cleymans, N., Desmet, T. To PEP or not to PEP; A retrospective analysis of (non)occupational post-exposure prophylaxis cases reported in the emergency department in order to refine the local treatment algorithm.

Introduction

Infectious diseases such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), and sexually transmitted infections (STIs) remain significant public health concerns. These pathogens are transmitted through bodily fluids in occupational and non-occupational settings. Occupational exposure typically occurs via needlestick injuries, mucosal contact or splash incidents, while non-occupational exposure is often linked to unprotected sexual contact or needle sharing. Post-exposure prophylaxis



(PEP) plays a pivotal role in reducing the risk of infection by inhibiting viral replication. Adherence to (inter)national guidelines ensures consistent and effective management of exposure. At the Ghent university hospital (UZ Gent), specific protocols for occupational PEP (OPEP) and non-occupational PEP (NONOPEP) provide structured guidance for managing exposure cases. These protocols were developed through consensus between emergency and general internal medicine physicians based on Belgian guidelines (2017). However, certain ambiguities remain necessitating further consultation and individualized decision-making. This study aims to evaluate local (NON)OPEP cases and adherence to the existing protocol. Additionally, a comparative analysis of local, national, and international guidelines was conducted to identify potential areas for protocol optimization.

Methods

A single-center retrospective observational study was conducted at the Emergency Department of UZ Gent. Patient records from April 1, 2023 to March 31, 2024 were reviewed. An independent researcher from the Data Science Institute identified 626 potential cases out of all patients visiting the Emergency Department, using an automated search with predefined search terms. After anonymization, we manually excluded 366 cases due to unrelated admission causes, non-medical needle injuries, or duplicate records, resulting in a final cohort of 260 patients. Data was extracted into an Excel database for further analysis. Ethical approval was granted by the Ethical Board of UZ Gent.

Results

The cohort included 125 men and 135 women, with a median age of 30 years. Among the 260 patients, 112 cases (43 %) involve NONOPEP, predominantly following unprotected sexual contact, including 10 cases of sexual violence. The remaining 148 cases (57 %) were OPEP-cases, with needlestick injuries from hollow needles being the most common cause. PEP was initiated in 92 cases (35 %), with over half of these cases receiving treatment within 24 hours of exposure. Protocol deviations were observed in 10 % of cases, often influenced by the involvement of General Internal Medicine specialists and their professional assessment of patient histories.



During follow-up consultations three days later, therapy was discontinued in 22 % of the cases.

Discussion

This study demonstrates that most patients with a possible indication for post-exposure prophylaxis (PEP), encompassing both occupational (OPEP) and non-occupational (NONOPEP) cases, were managed successfully and mostly according to (inter)national guidelines. However, protocol deviations were identified in 10 % of cases, often influenced by specialist judgment and patient-specific considerations. These deviations highlight the complexity of PEP decision-making and suggest a nuanced approach on a case by case basis. However, their impact requires further exploration. Investigating patterns in these deviations, such as variations in PEP initiation or therapy discontinuation during follow-up, will be key for optimizing local protocols and ensuring consistent care.

References

- Libois A, Florence E, Derdelinckx I, Yombi JC, Henrard S, Uurlings F, et al. Belgian guidelines for non-occupational HIV post-exposure prophylaxis 2017. Acta Clin Belg. 2018;73(4):275-80.

- Han A, Henderson DK. Postexposure prophylaxis for occupational exposure to selected pathogens for healthcare personnel. Curr Opin Infect Dis. 2024;37(4):296-303.

- Bryant J, Baxter L, Hird S. Non-occupational postexposure prophylaxis for HIV: a systematic review. Health Technol Assess. 2009;13(14):iii, ix-x, 1-60.

- McCormack D, Koons K. Sexually Transmitted Infections. Emerg Med Clin North Am. 2019;37(4):725-38.



Analysis of a modified Manchester triage scoring system for redirecting patient flow away from the emergency Department of a University hospital in Belgium

Author

- J. Libeer Resident Emergency Medicine, Ghent University Hospital
- T. Desmet Department of Emergency Medicine, Ghent university hospital
- N. Cleymans Department of Emergency Medicine, Ghent University Hospital

Citation

Libeer, J., Desmet, T., Cleymans, N. Analysis of a modified Manchester triage scoring system for redirecting patient flow away from the emergency Department of a University hospital in Belgium.

Introduction

Emergency department (ED) overcrowding has been a global healthcare concern since the 1990s (1). In Belgium, ED visits increased by 23 % between 2010 and 2019 (2), straining healthcare resources and impacting patient safety, care delays, and staff well-being (3). Non-urgent visits constitute a substantial portion of ED cases, with up to 40 % of patients potentially manageable by primary care physicians (4). Redirecting such cases to primary care could mitigate ED overcrowding and optimize resource allocation.

In 2022, the Ghent University Hospital ED implemented a pilot project to redirect patients with minor medical complaints, classified in the lowest urgency category of a modified Manchester Triage Score, to a primary care



facility on weekends and public holidays. This study evaluates the system's impact over 30 months.

Methods

This retrospective observational study included all patients presenting to the ED of Ghent University Hospital from April 1, 2022, to September 30, 2024. Ethical approval was obtained, and consent adhered to hospital policies. A 'non-urgent' triage category was developed in collaboration with primary care practitioners and emergency physicians. Trained triage nurses applied this modified Manchester Triage Score upon patient arrival. Patients classified as 'non-urgent' during primary care operating hours (Fridays 19:00-22:00, weekends and public holidays 08:00-22:00) were eligible for redirection. Data on triage outcomes, patient flow, and demographics (sex, age, nationality, address, insurance) were analyzed. Primary outcomes included the proportion of patients redirected, ED return rates post-redirection, and potential redirection rates if primary care operated 24/7.

Results

During the study period, 110,333 ED visits were recorded. Of these, 1.3 % (n = 1,466) were redirected to primary care. Extrapolated data suggest that up to 10.2 % (n = 11,202) of ED visits could be redirected with expanded primary care hours.

Among redirected patients, 6.6 % (n = 97) returned to the ED within 72 hours, either by immediate referral (n = 57) or on their own initiative (n = 40). Of those returning, 20,6 % (n = 20) were admitted to the hospital. The remaining 93.4 % of redirected patients were discharged from primary care without ED return within 72 hours.

Discussion

This study demonstrates that Ghent University Hospital's referral system effectively and safely redirects selected ED patients to primary care, reducing ED burden. With only 6.6 % of redirected patients requiring ED return, triage appears efficient in identifying suitable candidates for primary care.



Expanding primary care hours could increase redirection rates to 10.2 %, alleviating ED congestion further. However, literature suggests that up to 40 % of ED patients in Belgium could be managed by primary care (4), highlighting a significant gap. Future research should examine factors influencing ED return post-redirection and refine triage criteria to enhance referral efficiency, aiming to bridge this gap.

References

1. Hoot NR, Aronsky D. Systematic review of emergency department crowding: causes, effects, and solutions. Ann Emerg Med. 2008 Aug;52(2):126-36. doi: 10.1016/j.annemergmed.2008.03.014. Epub 2008 Apr 23. PMID: 18433933; PMCID: PMC7340358.

2. FOD Volksgezondheid België. Kenmerken contacten met spoedgevallendienst tussen 2010 en 2019. 2022.

3. Darraj A, Hudays A, Hazazi A, Hobani A, Alghamdi A. The Association between Emergency Department Overcrowding and Delay in Treatment: A Systematic Review. Healthcare (Basel). 2023 Jan 29;11(3):385. doi: 10.3390/ healthcare11030385. PMID: 36766963; PMCID: PMC9914164.

4. Van Den Heede K, Dubois C, Devriese S. Organisation and payment of emergency care services in Belgium: current situation and options for reform. In: (KCE) HSRHBBHCKC. 2016



Hemoglobin as a predictor of neurologic outcome after OHCA: A retrospective study

Author

Saen M – UZ Brussel Frigerio M – Università degli studi di Verona - AOUI Verona Cogozzo C – Department of Clinical and Experimental Medicine, University of Florence, Florence, Italy de Longueville D – CHU St-Pierre de Villenfagne MA – CHU St-Pierre Clignez G – CHU St-Pierre Malinverni S – CHU St-Pierre

Citation

Saen, M., Frigerio, M., Cogozzo, C., de Longueville, D., de Villenfagne, M.A., Clignez, G., Malinverni, S. Hemoglobin as a predictor of neurologic outcome after OHCA: A retrospective Study.

Introduction

We aimed to analyze whether hemoglobin following out-of-hospital cardiac arrest (OHCA) is an independent factor associated with favourable neurological outcome. Cardiac arrest induces cerebral hypoxia, leading to ischemic damage, with hypoxic brain injury being the primary cause of disability after return of spontaneous circulation (ROSC) [1].



Given that cerebral damage is multifactorial, one potential therapeutic pathway is ensuring adequate oxygen supply to the brain. In the early post-ROSC phase, cerebral oxygen delivery (CDO2) may rely on convective oxygen transport, where hemoglobin plays a key role as a determinant of CDO2 [1-3].

Methods

We performed a retrospective analysis of all OHCA managed by the emergency medical service of CHU Saint-Pierre from January 2017 to September 2024. Patient data were sourced, focusing on the epidemiological data, treatment interventions, and outcomes. We excluded minors, pregnant women, patients who died on arrival and those with a traumatic arrest. This study was approved by the Saint-Pierre Ethical Committee (CE/24-11-07).

Statistical analysis

To account for potential confounding variables, regression models were adjusted for age, initial rhythm, no-flow time, low-flow time and Charlson comorbidity index. Adjusted odds ratio (aOR) and 95% confidence intervals (Cls) are reported for each variable. Analyses were conducted using Stata software, version 16.1 (StataCorp, College Station, TX, USA).

Results

A total of 252 patients were included in the retrospective analysis, 71 patients (18%) had a good neurological outcome (Table 1). We found that the mean hemoglobin level at hospital arrival was significantly higher in the group with a good CPC score. Multivariate analysis adjusted for known confounders showed that the level of Hb at arrival was not independently associated with increased rate of good neurological outcome, with an adjusted odds ratio of 1.13 (95% CI: 0.92-1.39; p = 0.247).



Table 1. Baseline patients caracteristics and Hb levels with good and bad CPC score

	CPC score 1-2	CPC score 3-5	
number of observations	71	181	
Age, median (IQR), y	57 (48-73)	65 (53-78)	
Charlson comorbidity index before arrest, median (IQR)	2 (0-4)	3 (1-5)	
Witnessed arrest, No. (%)	62 (87.3)	152 (84)	
Bystander CPR, No. (%)	32 (45.1)	75 (41.4)	
Initial shockable rhythm, No. (%)	39 (54.9)	39 (21.6)	
Response interval, median (IQR), min	7 (5-9)	7 (5-9)	
No flow, median (IQR), min	2.5 (1-7)	5 (1-10)	
Low Flow, median (IQR), min	12 (9-19)	18 (13-25)	
Hb Levels	CPC score 1-2	CPC score 3-5	p-value
Hb level post-ROSC (IQR) g/dL	14.5 (13-15.6)	12.95 (11.35-14.95)	0.0028
Hb level 24h post-ROSC (IQR) g/dL	12.85 (11.3-14.3)	12.5 (10.4-14.7)	0.706
Hb level 48h post-ROSC (IQR) g/dL	11.75 (10.7-13.5)	12 (10.3-13.7)	0.793
Hb level 72h post-ROSC (IQR) g/dL	11.4 (10.25-12.8)	11 (9.25-12.85)	0.295

CPR, cardio-pulmonary resuscitation; ROSC, return of spontanious circulation; Hb, hemoglobin; IQR, interquartile range; No., number

Table 2. Unadjusted and adjusted analysis of factors associated with neurological outcome

Number of observations		Adjusted OR 95% Cl	
	Odds Ratio		p value
Age, median (IQR), y	0.99	0.94-1.04	0.700
Charlson comorbidity index	0.78	0.55-1.12	0.185
Initial shockable rhythm, No. (%)	7.25	2.54-20.70	< 0.001
No flow, median (IQR), minutes	0.87	0.77-0.99	0.033
Low flow, median (IQR), minutes	0.90	0.84-0.96	0.001
Hb level post-ROSC g/dL	1.13	0.92-1.39	0.247
Abbreviations: AED, automated external	defibrillator; CPR, card	iopulmonary resuscita	ation ; Hb,

hemoglobin; ROSC, return of spontaneous circulation; IQR, interquartile range

Discussion

In this retrospective, single-center study, univariate analysis indicated a positive correlation between higher hemoglobin levels at arrival and favorable 30-day neurological outcomes, but seems to fade at subsequently 24, 48 and 72 hours. However after adjustment for age, arrest characteristics, location, and comorbidities, hemoglobin levels upon hospital arrival were not independently associated with higher rates of ROSC (see table 2).

Three hypothesis could explain this results. First lower Hb levels likely reflect the severity of preexisting illness, therefore losing any association with the outcome when corrected for comorbidities. Second, at hospital admission, many post-CA patients are hypercapnic and acidotic, both of which cause an additional leftward shift of the dissociation curve mitigating the effect of



hemoglobin levels [4]. Third, hemoglobin serves as an oxygen carrier, with oxygen diffusion and absorption potentially impaired by disrupted cerebral autoregulation and local inflammation in the early days post ROSC thus mitigating the effect of oxygen carriage [1].

Limitations

This is a retrospective, observational study conducted at a single center, which limits the generalizability of the findings.

Conclusion

In this retrospective, single-center study, higher hemoglobin levels at hospital arrival showed a positive correlation with favorable 30-day neurological outcomes; however, after adjusting for known confounders, hemoglobin levels were not independently associated with favourable neurological outcome. Futher studies are needed to identify the role of hemoglobin in the different stages post-ROSC.

Literature

1. Sandroni C, Cronberg T, Sekhon M. Brain injury after cardiac arrest: pathophysiology, treatment, and prognosis. Intensive Care Med; 2021. 47:1393–1414.

2. Hoiland RL, Robba C, Menon DK, Citerio G, Sandroni C, Sekhon MS. Clinical targeting of the cerebral oxygen cascade to improve brain oxygenation in patients with hypoxic–ischaemic brain injury after cardiac arrest. Vol. 49, Intensive Care Medicine. Springer Science and Business Media Deutschland GmbH; 2023. 1062–78.



3. Hoiland RL, Ainslie PN, Wellington CL et al. Brain hypoxia is associated with neuroglial injury in humans post-cardiac arrest. Circ Res; 2021. 129:583–597.

4. Ameloot K, Genbrugge C, Meex I et al. Low hemoglobin levels are associated with lower cerebral saturations and poor outcome after cardiac arrest. Resuscitation; 2015. 96:280–286.

5. Nicholas JJ, Rosselot B, Sarah MP, et al. The association between hemoglobin concentration and neurologic outcome after cardiac arrest. J Crit Care. 2016. 36: 218–22.



Integrating biomarkers and clinical decision rules for optimized CT use in mild traumatic brain injury: A systematic review

Author

Justine Vanderstraeten, Said Hachimi Idrissi – Emergency department UZ Ghent, Belgium

Citation

Vanderstraeten, J., Hachimi Idrissi, S. Integrating biomarkers and clinical decision rules for optimized CT use in mild traumatic brain injury: A systematic review.

Introduction

Mild traumatic brain injury (mTBI) constitutes up to 90% of all traumatic brain injuries and is characterized by a Glasgow Coma Scale (GCS) score of 13–15 at presentation, accompanied by symptoms such as transient loss of consciousness (<30 minutes), post-traumatic amnesia (<24 hours), impaired mental state, or temporary neurological deficits. Diagnosing intracranial lesions in mTBI patients remains challenging due to the heterogeneity of clinical presentations. While clinical decision rules (CDRs) like the Canadian CT Head Rule (CCHR) help predict the need for head CT scans, CT usage rates remain high due to concerns over missed intracranial injuries. This not only increases healthcare costs and emergency department (ED) congestion but also exposes patients to unnecessary radiation. Recent research has explored integrating blood biomarkers, such as S100B, GFAP, and UCH-L1, into CDRs to enhance diagnostic precision. This review evaluates the diagnostic accuracy, cost-effectiveness, and clinical applicability of combining biomarkers with CDRs to optimize head CT use in mTBI.



Methods

A systematic review was conducted from February 2023 to August 2024 using PubMed, Google Scholar, Web of Science, and Embase. Studies focusing on adult mTBI patients and prespecified biomarkers (S100B, GFAP, UCH-L1, NFL, tau, NSE) were included. A total of 29 studies were assessed for quality using the Newcastle-Ottawa Scale. Key outcomes included sensitivity, negative predictive value (NPV), and cost-effectiveness.

Results

S100B and GFAP demonstrated 100% sensitivity and NPV, effectively ruling out intracranial complications and significantly reducing unnecessary CT imaging. S100B, when sampled within 6 hours post-injury, is already integrated into the Scandinavian Neurotrauma Committee (SNC) guidelines and has demonstrated cost-effectiveness, though adherence remains suboptimal. GFAP, unaffected by extracranial injuries, outperformed S100B and UCH-L1, as well as standalone CDRs. The GFAP/UCH-L1 combination (sampled <12 hours post-injury) demonstrated a 97.6% sensitivity and a 99.6% NPV and is approved by the U.S. FDA, though not yet available in Europe. Incorporating GFAP/UCH-L1 into a biomarker-first diagnostic strategy alongside CCHR is projected to be cost-neutral while reducing unnecessary CT use.

Discussion

This review highlights the diagnostic value and cost-effectiveness of integrating biomarkers, particularly S100B and GFAP/UCH-L1, into CDRs for mTBI assessment. Biomarker-based strategies demonstrate strong potential to enhance early exclusion of intracranial injuries while reducing CT overuse. However, variability in study designs, inconsistent control for confounders, and differences in biomarker standardization call for further large-scale research to validate these integrated approaches and support their global implementation.



Assessing the need for a Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) on-call service in a European major trauma centre: A retrospective cohort analysis

Author

Steven Van Schandevyl – Department of Emergency Medicine, Antwerp University Hospital, Drie Eikenstraat 655, 2650 Edegem, Belgium; Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium Eva Janssens – Department of Emergency Medicine, Antwerp University Hospital, Drie Eikenstraat 655, 2650 Edegem, Belgium; Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium Tine Bosiers – Department of Emergency Medicine, ZAS Cadix, Kempenstraat 100, 2030 Antwerp, Belgium

Philip Verdonck – Department of Emergency Medicine, Antwerp University Hospital, Drie Eikenstraat 655, 2650 Edegem, Belgium; Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium

Citation

Schandevyl, S.V., Janssens, E., Bosiers, T., Verdonck, P. Assessing the need for a Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) on-call service in a European major trauma centre: A retrospective cohort analysis.



Introduction

Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) is a technique used for the temporary control of life-threatening haemorrhage and provide haemodynamic stabilisation in peri-arrest settings caused by traumatic haemorrhagic shock, bridging patients to damage control surgery. Its use is associated with vascular complications ¹⁻³. REBOA is a technically demanding procedure with a significant learning curve, requiring adequate operator experience and procedural volume ⁴. Limited indications and the need for sufficient exposure complicate the development of a 24/7 on-call service.

This study quantified the annual number of REBOA-eligible major trauma patients at two hospitals in Antwerp, evaluating the justification for resource allocation.

Methods

This multicentre, retrospective cohort study analyses trauma registry data from Antwerp University Hospital (UZA) (2016 to 2023) and Ziekenhuis aan de Stroom (ZAS) Cadix (2020 to 2023). Based on literature ⁵, major trauma patients aged ≥16 years with shock and severe, non-compressible haemorrhage from blunt and/or penetrating injuries were included, focusing on deceased patients where REBOA might have improved survival.

Shock was defined as a systolic blood pressure <90 mmHg, \geq 4 units of red blood cell transfusion in the emergency department, or traumatic cardiac arrest (TCA) with return of spontaneous circulation (ROSC). Injuries required an Abbreviated Injury Scale (AIS) score \geq 3 in the chest, abdomen, pelvis, inguinal region, or lower extremities.

Exclusion criteria included severe cardiac or thoracic aortic injuries (AIS score \geq 3), vascular injuries proximal to the descending aorta, injuries to the neck, axilla, or mediastinum, pre-existing contraindications to REBOA (e.g. aortic disease or surgery), interhospital transfers, and refractory TCA without ROSC despite standard trauma care. Severe traumatic brain injury was not excluded.



Results

Of 2,299 major trauma patients, 148 (6.4%) were potential REBOA candidates, with 62 (2.7%) deceased. Annual REBOA indications averaged 7.0 (28 patients/4 years) at UZA (2016 to 2019), and 8.5 (34 patients/4 years) across both hospitals (2020 to 2023). Over an eight-year period, 62 deceased potential REBOA candidates were identified, averaging eight annual indications. Figure 1 illustrates the descriptive analysis. In the UZA cohort, five patients underwent REBOA placement, with three surviving.





Discussion

This study documented eight annual REBOA indications across two Antwerp centres, below the optimal exposure threshold (>10/hospital) suggested in literature ⁴. This may reflect differences in trauma care organisation in Belgium. The analysis did not evaluate REBOA's potential benefits in reducing blood product consumption, length of stay, or utility in non-traumatic indications. Individual case reviews are planned to confirm whether deceased patients received optimal standard care and to assess the preventability of death with the potential use of REBOA.

As not all Antwerp hospitals were included, the results may underestimate the true number of indications.

In conclusion, implementing a REBOA on-call service may not be feasible for trauma care in Antwerp due to the low volume of indications.

References

1. Bulger EM, Perina DG, Qasim Z, Beldowicz B, Brenner M, et al. Clinical use of resuscitative endovascular balloon occlusion of the aorta (REBOA) in civilian trauma systems in the USA, 2019: a joint statement from the American College of Surgeons Committee on Trauma, the American College of Emergency Physicians, the National Association of Emergency Medical Services Physicians and the National Association of Emergency Medical Technicians. Trauma Surg Acute Care Open. 2019 Sep 20;4(1):e000376.

2. Jansen JO, Hudson J, Cochran C, MacLennan G, Lendrum R, et al.; UK-REBOA Study Group. Emergency Department Resuscitative Endovascular Balloon Occlusion of the Aorta in Trauma Patients With Exsanguinating Hemorrhage: The UK-REBOA Randomized Clinical Trial. JAMA. 2023 Oct 12:e2320850.



3. Fontenelle Ribeiro Junior MA, Salman SM, Al-Qaraghuli SM, Makki F, Abu Affan RA, et al. Complications associated with the use of resuscitative endovascular balloon occlusion of the aorta (REBOA): an updated review. Trauma Surg Acute Care Open. 2024 Feb 7;9(1):e001267.

4. Gorman E, Nowak B, Klein M, Inaba K, Morrison J, et al. High resuscitative endovascular balloon occlusion of the aorta procedural volume is associated with improved outcomes: An analysis of the AORTA registry. J Trauma Acute Care Surg. 2021 Nov 1;91(5):781-789.

5. Maiga AW, Kundi R, Morrison JJ, Spalding C, Duchesne J, et al. Systematic review to evaluate algorithms for REBOA use in trauma and identify a consensus for patient selection. Trauma Surg Acute Care Open. 2022 Dec 23;7(1):e000984.



Hypertension grade III in the Emergency Department (ED) in Belgium

Author

Myron Degelaen – first author, MD, resident in acute medicine, military medical lieutenant in the Belgian Armed Forces Alexander Vermassen – co-author and speaker/presenter, MD, resident in emergency medicine Andrea Penaloza – co-author and co-promotor, MD, PhD, head professor and head physician of ED UCL Saint-Luc, Brussels, Belgium Alexandre Persu – co-author and co-promotor, MD, PhD, professor of cardiology and head of the hypertension clinic at UCL Saint-Luc, Brussels, Belgium Christos Fragoulis – co-author and co-promotor, MD, PhD, professor of cardiology of the Hippokration General Hospital, Athens, Greece Lara Absil – co-author and co-promotor, PhD, doctor in bio-medical sciences and coordinator of medical research at the ED UCL Saint-Luc, Brussels, Belgium Cornelia Genbrugge – co-author and primary promotor, MD, PhD, clinical researcher and emergency physician at UZ Leuven, Leuven, Belgium

Citation

Degelaen, M., Vermassen, A., Penaloza, A., Persu, A., Fragoulis, C., Absil, L., Genbrugge, C. Hypertension grade III in the Emergency Department (ED) in Belgium.

Introduction

Hypertension grade III, characterized by systolic blood pressure (SBP) >180 mmHg and/or diastolic blood pressure (DBP) exceeding 110 mmHg, represents a critical condition encountered in emergency departments (EDs) globally. This is also known as hypertensive urgency (HU) if no organ damage is present or hypertensive emergency (HE) if associated with organ damage (1-5).



Methods

This prospective observational study aimed to explore the characteristics, outcomes, and management strategies for patients with grade III hypertension presenting at the ED of the University Hospital Saint-Luc in Brussels, Belgium, over a one-year period (01/04/2023 to 31/03/2024).

Results

Among 160 patients with hypertension grade III, 29 (18.8%) were admitted to the hospital, with only 7 (4.4%) diagnosed with HE, while the remainder were categorized as HU. Incidences for respectively HU and HE were calculated at 2,5% and 0,01%, considering the total amount of ED presentations during the aforementioned period. Acute physiological/psychological stress, acute pain, and missed antihypertensive medication were the primary triggers for hypertension and presentation at the ED. The majority of patients (66.3%) were already on antihypertensive therapy, with ACE inhibitors being the most common. Treatment for the discharged patients in the ED was predominantly oral (58.8%), while intravenous therapy was more common among admitted patients (58.6%).

Conclusion

These results suggest that HU is far more prevalent than HE, with a ratio of 22:1, and emphasize the importance of tailored management based on the severity of hypertension and the presence of organ damage. The study's limitations include the exclusion of neurological cases, which may have led to an underestimation of the true incidence of HE and HU. Further research with a broader sample is needed to confirm these findings and refine management protocols.

References

1. Williams B, Mancia G, Spiering W, Rosei EA, Azizi M, Burnier M, et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. Vol. 39, European Heart Journal. Oxford University Press; 2018. p. 3021–104.



2. Zhou B, Bentham J, Di Cesare M, Bixby H, Danaei G, Cowan MJ, et al. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants. The Lancet [Internet]. 2017 Jan;389(10064):37–55. Available from: https:// linkinghub.elsevier.com/retrieve/pii/S0140673616319195

3. Chow CK, Teo KK, Rangarajan S, Islam S, Gupta R, Avezum A, et al. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. JAMA. 2013 Sep 4;310(9):959–68.

4. Astarita A, Covella M, Vallelonga F, Cesareo M, Totaro S, Ventre L, et al. Hypertensive emergencies and urgencies in emergency departments: A systematic review and meta-analysis. Vol. 38, Journal of Hypertension. Lippincott Williams and Wilkins; 2020. p. 1203–10.

5. Vaughan CJ, Delanty N. Hypertensive emergencies. The Lancet. 2000;356(9227):411–7.



Impact of the COVID-19 pandemic on pediatric psychiatric presentations in the Emergency Department: A retrospective analysis at Auxerre hospital

Author

llinca Romocea – Emergency Department, University Hospital of Dijon Cristian Terec – Emergency Department, University Hospital of Dijon Bertrand Soto – Chief of Pediatrics, Auxerre Hospital Jeanette Akpona – Pediatric Emergency Department, Auxerre Hospital Charles Chater – Pediatric Emergency Department, Auxerre Hospital Caroline Toma – Pediatric Emergency Department, Auxerre Hospital

Citation

Romocea, I., Terec, C., Soto, B., Akpona, J., Chater, C., Toma, C. Impact of the COVID-19 pandemic on pediatric psychiatric presentations in the Emergency Department: A retrospective analysis at Auxerre hospital.

Introduction

The COVID-19 pandemic has had profound effects on youth mental health due to social isolation, uncertainty, and disrupted daily routines (1-4). Our study retrospectively examines trends in psychiatric presentations at Auxerre's Pediatric Emergency Department over three periods: preconfinement and at the beginning of social isolation (first semester of 2020), during confinement (first semester of 2022), and post-pandemic (first semester of 2024).



Methods

This study retrospectively analyzed psychiatric presentations to the Pediatric Emergency Department of Auxerre Hospital for patients between January and June of 2020, 2022, and 2024. Cases were identified using relevant ICD-10 codes, including Group F (F00-F99): Mental and behavioral disorders, Group R (R45, R46, R63): Symptoms relating to emotional state and Group T (T36-T50, T51): Intentional intoxications by medications, substances, and alcohol. Only intentional intoxications were included. Data on patient age, diagnosis, and monthly psychiatric case proportions were extracted from the hospital's digital patient database. Proportions were compared using t-tests, with trends in key psychiatric diagnoses analyzed across the 3 periods.

Results

Between January and June, Auxerre's emergency department saw 4,756 patients in 2020, 8,350 in 2022, and 9,162 in 2024. Psychiatric presentations accounted for 1.62-4.35% in 2020, 1.54-2.99% in 2022, and 1.23-2.70% in 2024. Although no statistically significant change was found between periods (2020 vs. 2024, p=0.15), there was a notable increase in the severity of diagnostics.

Suicidal ideation cases rose by 733%, from 6 cases in 2020 to 50 cases in 2022, before slightly declining to 40 cases (20% reduction) in 2024

Severe intoxications increased by 34.8% from 23 cases in 2020 to 31 cases in 2022, peaking at 47 cases (51.6% increase) in 2024.

Depressive episodes showed a 163.6% increase, from 11 cases in 2020 to 29 cases in 2022, rising further by 44.8% to 42 cases in 2024.

Discussion

Despite the absence of significant increases in overall psychiatric case proportions in the Pediatric Emergency Department of Auxerre Hospital, our findings highlight a worsening in case severity, notably in depression


and self-harm. This underscores a need for targeted mental health support strategies in emergency settings. International comparisons reveal similar trends, emphasizing the pandemic's enduring impact on youth mental health (3, 4).

References

1. Cousien A, Acquaviva E, Kernéis S, Yazdanpanah Y, Delorme R. Temporal trends in suicide attempts among children in the decade before and during the COVID-19 pandemic in Paris, France. JAMA Netw Open. 2021;4(10): e2128611. doi:10.1001/jamanetworkopen.2021.28611

2. Ougrin D, Wong BH, Vaezinejad M, et al. Effects of the COVID-19 pandemic on mental health services in children and adolescents in Europe: A Multicentre Survey. The Lancet Psychiatry. 2021;8(7):500-502.

3. Leeb RT, Bitsko RH, Radhakrishnan L, Martinez P, Njai R, Holland KM. Mental health-related emergency department visits among children aged <18 years during the COVID-19 pandemic — United States, January 1–October 17, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(45):1675-1680.

4. Yard E, Radhakrishnan L, Ballesteros MF, Sheppard M, Gates A, Stein Z, Hartnett KP, Kite-Powell A, Rodgers L, Adjemian J, Anderson KN. Emergency Department Visits for Suspected Suicide Attempts Among Persons Aged 12–25 Years Before and During the COVID-19 Pandemic — United States, January 2019–May 2021. MMWR Morb Mortal Wkly Rep. 2021;70(24):888-894.



PACED COVID19 - Patient characteristics at the emergency department during the COVID-19 pandemic – A retrospective analysis of non-respiratory attendances and trends in trauma-related attendances at the University Hospital of Ghent

Author

Henryk Bonte, Jolien De Pryck, Peter De Paepe, Tania Desmet– Department of Emergency Medicine, Ghent University Hospital, Belgium

Citation

Bonte, H., De Pryck, J., De Paepe, P., Desme, T. PACED COVID19 - Patient characteristics at the emergency department during the COVID-19 pandemic – A retrospective analysis of non-respiratory attendances and trends in trauma-related attendances at the University Hospital of Ghent.

Introduction

Although emergency departments (EDs) worldwide were prepared for an increase in demand during the COVID-19 pandemic (1), many experienced a decrease in demand during the lockdown. This study aims to describe the impact of the first Belgian COVID-19 wave and its lockdown measures on a Belgian ED. The primary objective of this study is to describe changes in



patient demographics, attendance volume, and the types of presenting nonrespiratory complaints using triage criteria at presentation. The secondary objective is to analyse trends in trauma presentations,

Methods

This study is a retrospective observational study at University Hospital of Ghent, a tertiary hospital and level 1 trauma centre in Ghent, Belgium. It is part of the "PACED COVID-19 Study". Data were collected from patients visiting the Emergency Department from March 1st to May 31st 2020, with a comparison to ED visits during the same period in 2019. A second detailed analysis was conducted ED visits involving trauma presentations.

Results

The COVID-19 pandemic led to a 15% decrease in ED visits, most notably in the initial lockdown weeks. Respiratory complaints (25.9%) became the leading cause for ED admission, with a demographic shift towards older individuals and a trend towards less severe cases.

The proportion of trauma related presentations in the ED significantly declined during the COVID19 lockdown from 33.8% to 25.2% (P <0,05). Minor injuries still counted as the biggest proportion, but there was a significant decrease from 52.0% to 46.7% (P <0.05). Further, we saw a significant increase in patient presenting after a fall 7.1% to 9.9% (P< 0.05). Major trauma (eg "polytrauma") events proportionally increased, but not significantly and in not absolute numbers (2.6% to 3.0%). ICU admissions following these events did not increase as well during this period.

Discussion

The COVID-19 pandemic and the associated lockdown measures significantly altered emergency department (ED) utilization patterns at the University Hospital of Ghent (see figure 1).





This decline, particularly in trauma-related presentations, underscores how public health crises can reshape healthcare-seeking behaviour and resource demands. These shifts reflect the broader societal and behavioural changes induced by the pandemic, such as reduced mobility, changes in recreational activities and delayed healthcare-seeking for non-urgent issues. This study highlights the critical need for EDs and healthcare systems to implement adaptive strategies during future public health crises. Strategies should focus on maintaining flexibility in resource allocation and using predictive analytics to prepare for shifts in patient demographics and case severity. By integrating lessons from the COVID-19 pandemic, EDs can better anticipate and respond to evolving healthcare demands during future crises, ensuring optimal care delivery and preparedness.

Reference

(1) Luyten J, Schokkaert E. Belgium's response to the COVID-19 pandemic. Health Econ Policy Law. 2021:1-11.



Impact of clinical context on the interpretation of gallbladder ultrasound images: A pilot study

Author

Havva-Nur Bayraktar – Department of Emergency Medicine, Cliniques universitaires Saint-Luc, Brussels Joana Rodrigues de Castro – Department of Emergency Medicine, GHDC, Charleroi Caroline Poletti – Department of Emergency Medicine, Cliniques universitaires Saint-Luc, Brussels Alix Collard – Departement of Statistical analysis, Cliniques universitaires Saint-Luc, Brussels Florence Dupriez – Department of Emergency Medicine, Cliniques universitaires Saint-Luc, Brussels Bastian Rodrigues de Castro – Department of Emergency Medicine, Cliniques universitaires Saint-Luc, Brussels

Citation

Bayraktar, H-N., de Castro, J.R., Poletti, C., Collard, A., Dupriez, F., de Castro, B.R. Impact of clinical context on the interpretation of gallbladder ultrasound images: A pilot study.

Introduction

Clinical ultrasound is an essential tool for emergency medicine practitioners [1]. It is particularly useful for evaluating abdominal pain to detect the presence of gallstones or to identify other signs compatible with the diagnosis of biliary colic or cholecystitis [2]. Although these signs are welldefined in the literature, the influence of clinical context on ultrasound interpretation has not yet been studied. The primary objective of this study is to evaluate the impact of clinical context on the interpretation of PoCUS



images of normal and pathological gallbladders by emergency medicine residents.

Methods

This observational prospective pilot study was conducted from May to September 2023 with postgraduate emergency medicine students from three Belgian universities. Participants watched a 45-minute tutorial video on clinical gallbladder ultrasound and then completed a multiple-choice guestionnaire consisting of 40 dynamic ultrasound loop images, 20 without clinical context and the same 20 images with written descriptions of the clinical context. The clinical vignettes were prepared based on real-life cases encountered in clinical practice. They included medical history, current treatments, and clinical data. Among the 20 ultrasound loops, there were five normal gallbladders, seven gallbladders with lithiasis, three cases of acute cholecystitis, two gallbladder polyps, and two gallbladders with wall thickening without cholecystitis. Paired Student's t-test was performed to compare diagnostic performances with and without clinical context. The χ 2-values from the McNemar test were calculated to assess any significant differences between the two evaluation contexts in terms of diagnostic accuracy.

Results

Overall, 23 participants completed the study, with 920 ultrasound loops being analyzed. The inclusion of clinical context significantly improved the overall diagnostic performance and especially the diagnosis of acute cholecystitis (p=0.0309 and p=0.0029, respectively). The overall sensitivity and specificity without clinical context were 0.74 (95% CI, 0.69-0.79) and 0.82 (95% CI, 0.76-0.87) respectively, and 0.79 (95% CI, 0.74-0.84) and 0.84 (95% CI, 0.79-0.90) with clinical context. In the subgroup of acute cholecystitis, sensitivity and specificity without clinical context were 0.56 (95% CI, 0.44-0.67) and 0.97 (95% CI, 0.95-0.99) respectively, and 0.78 (95% CI, 0.68-0.88) and 0.97 (95% CI, 0.95-0.99) with clinical context (Table 1).



Table 1 : Diagnostic Performance of PoCUS with and without Clinical Context

Parameter	Without Clinical Context	With Clinical Context	χ² Value
Overall Sensitivity	0.74 (95% Cl, 0.69- 0.79)	0.79 (95% Cl, 0.74- 0.84)	13 (p=0.0309)
Overall Specificity	0.82 (95% CI, 0.76- 0.87)	0.84 (95% Cl, 0.79- 0.90)	5 (p=0.0129)
Sensitivity for Acute Cholecystitis	0.56 (95% Cl, 0.44- 0.67)	0.78 (95% Cl, 0.68- 0.88)	13 (p=0.0129)
Specificity for Acute Cholecystitis	0.97 (95% Cl, 0.95- 0.99)	0.97 (95% Cl, 0.95- 0.99)	NS (Not Significant)

Créé avec Datawrapper

Discussion

This pilot study highlights the importance of integrating the patient's clinical context into the interpretation of ultrasound loops for normal and pathological gallbladders. The findings demonstrate an increase in sensitivity (from 0.54 to 0.78 for acute cholecystitis) and narrower confidence intervals when clinical context is considered, underscoring the reliability and accuracy of PoCUS when used in conjunction with clinical information. Specificity remained high (0.97), indicating minimal impact of clinical context on false positives. These results align with existing guidelines that emphasize combining clinical, biological, and imaging data for diagnosing acute cholecystitis [3 – 4]. The study also supports the efficacy of theoretical distance learning in teaching PoCUS skills to emergency medicine residents, who demonstrated satisfactory image interpretation despite a lack of practical training.



Conclusion

The integration of clinical context appears to positively influence the interpretation of gallbladder ultrasound images, thereby enhancing diagnostic performances, especially sensitivity and particularly in the case of acute cholecystitis.

References

[1] Ultrasound Guidelines: Emergency, Point-of-Care, and Clinical Ultrasound Guidelines in Medicine. Ann Emerg Med. 2023 Sep;82(3):e115-e155. doi: 10.1016/j.annemergmed.2023.06.005. PMID: 37596025.

[2] Expert Panel on Gastrointestinal Imaging: Peterson CM, McNamara MM, Kamel IR, Al-Refaie WB, Arif-Tiwari H, Cash BD, Chernyak V, Goldstein A, Grajo JR, Hindman NM, Horowitz JM, Noto RB, Porter KK, Srivastava PK, Zaheer A, Carucci LR. ACR Appropriateness Criteria® Right Upper Quadrant Pain. J Am Coll Radiol. 2019 May;16(55):S235-S243. doi: 10.1016/j. jacr.2019.02.013. PMID: 31054750.

[3] Pisano M, Allievi N, Gurusamy K, Borzellino G, Cimbanassi S, Boerna D, Coccolini F, Tufo A, Di Martino M, Leung J, Sartelli M, Ceresoli M, Maier RV, Poiasina E, De Angelis N, Magnone S, Fugazzola P, Paolillo C, Coimbra R, Di Saverio S, De Simone B, Weber DG,



Sakakushev BE, Lucianetti A, Kirkpatrick AW, Fraga GP, Wani I, Biffl WL, Chiara O, Abu- Zidan F, Moore EE, Leppäniemi A, Kluger Y, Catena F, Ansaloni L. 2020 World Society of Emergency Surgery updated guidelines for the diagnosis and treatment of acute calculus cholecystitis. World J Emerg Surg. 2020 Nov 5;15(1):61. doi: 10.1186/s13017- 020-00336-x. PMID: 33153472; PMCID: PMC7643471.

[4] Yokoe M, Hata J, Takada T, Strasberg SM, Asbun HJ, Wakabayashi G, Kozaka K, Endo I, Deziel DJ, Miura F, Okamoto K, Hwang TL, Huang WS, Ker CG, Chen MF, Han HS, Yoon YS, Choi IS, Yoon DS, Noguchi Y, Shikata S, Ukai T, Higuchi R, Gabata T, Mori Y, Iwashita Y, Hibi T, Jagannath P, Jonas E, Liau KH, Dervenis C, Gouma DJ, Cherqui D, Belli G,

Garden OJ, Giménez ME, de Santibañes E, Suzuki K, Umezawa A, Supe AN, Pitt HA, Singh H, Chan ACW, Lau WY, Teoh AYB, Honda G, Sugioka A, Asai K, Gomi H, Itoi T, Kiriyama S, Yoshida M, Mayumi T, Matsumura N, Tokumura H, Kitano S, Hirata K, Inui K,

Sumiyama Y, Yamamoto M. Tokyo Guidelines 2018: diagnostic criteria and severity grading of acute cholecystitis (with videos). J Hepatobiliary Pancreat Sci. 2018 Jan;25(1):41-54. doi: 10.1002/jhbp.515. Epub 2018 Jan 9. PMID: 29032636.



Impact of a cognitive aid on CPR guidelines adherence in a simulation-based setting: A monocentric randomized controlled trial

Author

Verjans Renaud, Dubois Nadège, Piazza Justine, Failon Gilles, Koeune Clara, Klenkenberg Sophie, Donneau Anne-Françoise, Tubes Rebecca, Ghuysen Alexandre – CHU

Citation

Renaud, V., Nadège, D., Justine, P., Gilles, F., Clara, K., Sophie, K., Anne-Françoise, D., Rebecca, T., Alexandre, G. Impact of a cognitive aid on CPR guidelines adherence in a simulation-based setting: A monocentric randomized controlled trial.

Introduction

Intra-hospital cardiac arrest (IHCA) poses a significant public health challenge, with an incidence in Europe ranging from 1.5 to 2.8 per 1000 hospitalizations and survival rates varying between 15 to 34% (1). To address this issue, scientific organizations like the European Resuscitation Council (ERC) formulate guidelines for cardiac arrest (CA) management (2). Adhering to these guidelines is crucial, as the rate of return of spontaneous circulatory activity (ROSC) and overall prognosis are directly influenced by the quality of



cardiopulmonary resuscitation (CPR) (3). This study aims to assess the impact of a cognitive aid on adherence to ERC guidelines.

Methods

A randomised control monocentric quantitative prospective study geared towards comparing the adhesion to the ALS algorithm between a test group using a mobile cognitive and a control group without this tool during a simulation session (see table 1). Participants were physicians and nurses. CPR competencies were measured through an evaluation grid developed based on structure of the CASTest edited by the ERC. Durations and anticipation actions were also evaluated. Self-efficacy sense was also collected before and after simulation session.

Results

The quality of CPR significantly differed between groups, with higher scores in the test group (90.9) compared to control group (81.8). The duration of low flow during CPR was significantly longer in the control group. Significative group differences were noted in various binary anticipation variables, with the test group demonstrating higher level of anticipation. No significant change was observed regarding the evolution of the overall selfefficacy. The participants in the test group were generally satisfied with the created ALS application.

Conclusion

The cognitive aid created in the form of a mobile application allows a better adherence to the ERC recommendations, providing a solution to facilitate decision making.



TABLE 1: Description of study protocol





Belgian Society of Emergency and Disaster Medicine BESEDIM

References

1. Gräsner J-T, et al. European Resuscitation Council Guidelines 2021: Epidemiology of cardiac arrest in Europe. Resuscitation 161;2021:61-79

2. Perkins G, et al. European Resuscitation Council Guidelines 2021: Executive summary. Reuscitation 161;2021:1-60.

3. Wijdicks EFM, et al. Quality Standards Subcommittee of the American Academy of Neurology. Practice parameter: prediction of outcome in comatose survivors after cardiopulmonary resuscitation (an evidence-based review): report of the quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2006 25;67:203–10.



How hyperventilation might kill you - A case report

Author

Denys Marie-Astrid – Emergency department, Sint-Andries Hospital Tielt Vertriest Céline – Emergency department, Sint-Andries Hospital Tielt Lamont Bart – Neurology department, Sint-Andries Hospital Tielt Bresseleers Jan – Cardiology department, Sint-Andries Hospital Tielt Vandeplassche Sophie – Emergency department, Sint-Andries Hospital Tielt

Citation

Marie-Astrid, D., Céline, V., Bart, L., Jan, B., Sophie, V. How hyperventilation might kill you - A case report.

Introduction

Hyperventilation syndrome is a highly prevalent condition at emergency departments characterized by excessive breathing beyond the body's metabolic demands, leading to the elimination of more carbon dioxide (CO2) than is produced, which results in respiratory alkalosis and a variety of physical symptoms and potential electrolyte disorders such as hypokalemia. Serum potassium decreases in proportion to reduction in PaCO2, since extracellular potassium ions shift into cells as result of the reduction in hydrogen ions in the intracellular fluid when PaCO2 lowers (1).

Case presentation

We present a case of hypokalemia with critical electrocardiogram (ECG) changes and neurological deficit secondary to hyperventilation syndrome, diagnosed in the emergency department following admission for an orthostatic syncope.



A 71-year-old man was admitted to the emergency department after having a syncope, preceded by complaints of vertigo when standing up to walk. The paramedical intervention team (PIT) found a pale patient on the ground, who was unresponsive, unable to move his arms and legs, and was staring in front of him. After regaining consciousness he vomited and complained of cervicalgia. On initial evaluation in the emergency department, the patient was groaning and hyperventilating without any focused contact and a GCS of 8 (E2V2M4). Blood pressure was 140/52mmHg on the right side, and 113/55mmHg on the left side.

The patient had a history of cervical spinal canal stenosis and chronic lumbar back pain, and a cardiovascular history of arterial hypertension, hypercholesterolemia, coronary and peripheral arterial disease.

Arterial blood gas analysis showed a state of respiratory alkalosis with a pH of 7.74, with a normal PaO_2 (99mmHg) and a decreased $PaCO_2$ (16mmHg), and a HCO₃ of 21.4 mmol/L together with a hypokalemia of 2.6 mmol/L and ionized hypocalcemia of 1.12 mmol/L. Lactate level was 49.1 mg/dL. There were diffuse de novo repolarization disorders on ECG (figure 1).

Imaging ruled out an aortic dissection or traumatic fractures, and highlighted the known degeneration of multiple cervical discs, cervical spinal stenosis (C3C4 – C4C5), and significantly narrowed neuroforamina (C3C4 left; C4C5 – C5C6 bilaterally). Echocardiography and cardiac checkup were normal at the emergency department. EEG showed no epileptic activity.

After administration of analgetics (IV paracetamol 1g, IV fentanyl 100mcgr 2x), anti-emetics (IV alizapride 50mg, IV ondansetron 4mg), IV midazolam 1mg 2x and IV fluid replacement therapy with 500mg NaCl 0.9% with 20 mEq KCl and 1 gram MgSO4, there was a complete remission to normal functioning and a GCS of 15. Hyperventilation syndrome with tetany was assumed the main cause of respiratory alkalosis secondary to excessive neck pain after an orthostatic syncope. After remission, venous blood gas analysis showed a normal pH (7.40), with a potassium level of 3.46 mmol/L, ionized calcemia of 1.12 mmol/L, and a lactate level of 20.9 mg/dL, together with



normalization of the ECG trace (see figure 1). The patient was admitted to the neurology department for further investigations.





Discussion

Hypokalemia can result from various mechanisms, including increased losses (renal or gastrointestinal), decreased intake, or redistribution into cells. In this patient, potential contributors included:

- Diuretic use: The patient was taking Nobiretic (nebivolol/ hydrochlorothiazide), which can cause potassium loss. However, diuretic-induced hypokalemia is typically associated with metabolic alkalosis rather than respiratory alkalosis.
- Gastrointestinal losses: While vomiting can lead to hypokalemia, significant hypochloremic metabolic alkalosis is typically present in severe cases, which was not observed here.
- Magnesium deficiency: Hypomagnesemia can cause renal potassium wasting, though the patient's baseline magnesium was normal (0.83 mmol/L).
- Intracellular shifts: Respiratory alkalosis drives intracellular potassium shifts as hydrogen ions move out of cells to buffer extracellular alkalosis. This was likely the primary mechanism in this case.

Despite the normal HCO_3 (21.4 mmol/L), the acute nature of hyperventilation explains this finding. Renal compensation for respiratory alkalosis is slow, requiring hours to days, whereas intracellular buffering occurs rapidly. Additionally, the patient's elevated lactate levels may have influenced the acid-base balance.

Conclusion and take-home message

• Hyperventilation syndrome can cause transient hypokalemia due to intracellular potassium shifts.



- In acute respiratory alkalosis, bicarbonate levels may remain near normal due to delayed renal compensation.
- A comprehensive approach, including history, blood gas analysis, and ECG evaluation, is crucial for accurate diagnosis and management.

Reference

(1) Moon HS, Lee SK, Chung JH, In CB. Hypocalcemia and hypokalemia due to hyperventilation syndrome in spinal anesthesia -A case report-. Korean J Anesthesiol. 2011 Dec;61(6):519-23. doi: 10.4097/kjae.2011.61.6.519. Epub 2011 Dec 20. PMID: 22220232; PMCID: PMC3249577.



Pericardial tamponade as a rare presentation of lymphoma: A case report

Author

Arnout Lauriks, Van Herck J., Jorens PG – From the department of Intensive Care Medicine, Antwerp University Hospital, University of Antwerp, Edegem, Belgium

Citation

Lauriks, A., Van Herck, J., Jorens, P.G. Pericardial tamponade as a rare presentation of lymphoma: A case report.

Introduction

Pericardial effusion occurs in 5-24% of patients with Hodgkin's lymphoma (HL) and is usually asymptomatic (1). We describe a rare case of HL where pericardial tamponade was the presenting symptom, requiring a novel ultrasound-guided emergency pericardiocentesis technique to be performed.

Clinical case

A previously healthy 22-year-old woman presented to the emergency department with subacute dyspnea. She was tachycardic and hypoxic despite 15L/min of oxygen. A massive left-sided pleural effusion was noted on chest X-ray and drained, producing 5L of serous fluid. A chest CT showed enlarged lymph nodes and a right sided pleural effusion. She was intubated and ventilated, with drainage of the contralateral pleural effusion. Retrieval to our tertiary ICU was requested.



At our arrival, she was hypotensive despite a $1 \mu g/kg/min$ noradrenalin infusion. A 500 ml crystalloid bolus was administered, as well as push-dose adrenalin followed by an infusion. She remained hypoxic, for which we increased PEEP and switched to pressure controlled ventilation. POCUS was performed following the rapid ultrasound in shock and hypotension (RUSH) protocol, showing a significant amount of pericardial fluid (Fig. 1a). Classic echocardiographic signs of tamponade were present: systolic RA and diastolic RV collapse, with an inferior vena cava diameter of > 2 cm without respiratory variation (2). No immediate support from a cardiologist or cardiothoracic surgeon was available. We performed ultrasound-guided pericardiocentesis via the left parasternal window (Fig. 1b) following a technique proposed by Nagdev et al. (Fig. 2), as opposed to the classic landmark sub-xiphoidal approach (3).



FIGURE 1

Subxiphoid window (1a, left) and parasternal window acquired with the curvilinear (abdominal) probe (1b, right), with red arrow indicating the needle trajectory for pericardiocentesis.





Simplified in-plane ultrasound-guided pericardiocentesis (Nagdev et al., with image reproduction from their article) (3).

190 ml of clear pericardial fluid was removed after insertion of a pigtail drain. Patient remained hemodynamically unstable during transfer to our ICU. She showed signs of right-sided heart failure, treated by hemodynamic and ventilatory optimization including inotropes and inhaled NO. She ultimately required VV-ECMO for refractory hypoxia. A biopsy of the lymphadenopathies showed a stage IVB classical Hodgkin's lymphoma.

Corticosteroid treatment was urgently started, resulting in spectacular cardio-respiratory improvement. She had a prolonged ICU course, but is currently being treated on an ambulatory basis for her HL and is doing well.



Discussion

HL related pericardial tamponade remains a rare entity (4). One case report describes a similar presentation with prompt drainage of 1.7L of pericardial fluid which led to a low cardiac output syndrome requiring VA-ECMO support with good outcome: the drainage of the pericardial effusion may have contributed to the prolonged need for inotropic support (5). As HL has a good post-therapy survival, aggressive treatment in the case of pericardial tamponade is warranted, especially in young patients.

The use of POCUS in suspected pericardial tamponade has been associated with a shorter time to diagnosis and pericardiocentesis, whereas physical examination and ECG findings are poorly predictive for tamponade (2). A parasternal ultrasound-guided technique was employed in a classic high acuity, low occurrence (HALO) procedure. Though experienced in ultrasound-guided Seldinger technique for central line and pleural drain placement, this was the author's first pericardiocentesis. Emergency physicians should familiarize themselves with HALO procedures such as pericardiocentesis, in case they ever need to perform them.

References

1. Marks LJ, McCarten KM, Pei Q, Friedman DL, Schwartz CL, Kelly KM. Pericardial effusion in Hodgkin lymphoma: a report from the Children's Oncology Group AHOD0031 protocol. Vol. 132, Blood. United States; 2018. p. 1208–11.

2. Alerhand S, Adrian RJ, Long B, Avila J. Pericardial tamponade: A comprehensive emergency medicine and echocardiography review. Am J Emerg Med. 2022 Aug;58:159–74.

3. Nagdev A, Mantuani D. A novel in-plane technique for ultrasoundguided pericardiocentesis. Am J Emerg Med. 2013 Sep;31(9):1424.e5-9.



4. Adler AC, Cestero C. Symptomatic pericardial effusion in Hodgkin's lymphoma: a rare occurrence. Case report and review of the literature. Tumori. 2012;98(2):50e-52e.

5. Matic T, Bakos M, Saric D, Cvitkovic M, Salek Z, Mestrovic D, et al. Low cardiac output syndrome requiring extracorporeal membrane oxygenation following pericardiocentesis in an adolescent with Hodgkin Lymphoma: a case report. Perfusion. 2021 Jul;36(5):529–31.



Emergency Department management of severe late-onset ovarian hyperstimulation syndrome: case report

Author

Quentin Paeschen – Emergency Department, University Hospital of Liège, 4000 Liège, Belgium Laetitia Rousseau – Center for Reproductive Medicine, University of Liège-Citadelle Site, 4000 Liege, Belgium Laurie Henry – Center for Reproductive Medicine, University of Liège-Citadelle Site, 4000 Liege, Belgium Alexandre Ghuysen – Emergency Department, University Hospital of Liège, 4000 Liège, Belgium

Citation

Paeschen, Q., Rousseau, L., Henry, L., Ghuysen, A. Emergency department management of severe late-onset ovarian hyperstimulation syndrome: Case report.

Introduction

Ovarian hyperstimulation syndrome (OHSS) is an iatrogenic consequence of ovulation induction, resulting in a hormonal storm during the luteal phase or early pregnancy in an in vitro fertilisation (IVF) protocol. This is a rare but potentially fatal complication (1).

Emergency departments (EDs) are rarely aware of it and this lack of knowledge explains the difficulty in managing OHSS.



Setting

A 35-year-old patient was admitted at the Emergency Department (ED) with acute left abdominal pain two weeks after ovarian stimulation with an ultrasound-guided transvaginal oocyte pick-up followed by a fresh blastocyst transfer. A left ovarian torsion was confirmed and managed laparoscopically. She was discharged but returned the same day with exertional dyspnoea, desaturation at 93% and sinus tachycardia. An ultrasound showed a 3 cm right pleural effusion, collapsed vena cava and anechoic abdominal fluid. The blood test confirmed early pregnancy. Severe late ovarian hyperstimulation syndrome (OHSS) was diagnosed. She was transferred to the intensive care unit for monitoring and management included IV crystalloid hydration and thromboprophylaxis. The patient recovered fully and was discharged without complications.

Discussion

Infertility affects around one in six couples and many couples turn to IVF for help.

OHSS is a disproportionate response to controlled ovarian stimulation with exogenous gonadotropin, with an excessive production of estradiol and vascular endothelial growth factor (VEGF). The key mechanism is vasodilation and increased permeability. It leads to a third space and intravascular volume depletion. (cfr table1) It increases morbidity and mortality if not recognised and managed correctly (1). OHSS is graded as mild, moderate, severe or critical. (cfr table 2)

Symptoms are often non-specific and diagnosis is challenging. They range from abdominal pain with bloating and nausea to dyspnoea, rapid weight gain and, in severe cases, thrombotic events (2).



OHSS must be considered in any patient with a history of ovarian stimulation and oocyte retrieval. Initial management includes a blood test to reflect haemoconcentration, ionic disorders and, in the worst cases, renal and hepatic failure. Transvaginal ultrasound is performed to assess for ovarian enlargement, ascites and to exclude ovarian torsion. Ultrasound is also used to look for interstitial pulmonary oedema, pleural or pericardial effusion or tamponade (3). (cfr table 2)







Grade	Symptoms	Lab	
Mild	Abdominal bloating	Non major alteration	
	Mild abdominal pain		
	Ovarian size < 8 cm		
Moderate	Moderate abdominal pain	Htc > 41%	
	Nausea and vomiting	WBC > 15000	
	Ascites on ultrasound		
	Ovarian size 8-12 cm		
	Weight gain > 3 kg		
	Severe abdominal pain	Htc > 45%	
Severe	Clinical Ascites	WBC > 25000	
	Pleural effusion	Clearance creat < 50	
	Hypovolemia	ml/min	
	Oliguria	Creat > 1,6 mg/dl	
	Ovarian size > 12 cm	Na < 135, K >5 (mEq/l)	
	Weight gain > 15- 20 kg	GOT/GPT rising	
Critical	Major ascites	More pronounced aggravation	
	Hydrothorax		
	Anuria		
	Thromboses		
	ARDS		

Management is mainly symptomatic in low and moderate grades. In higher grades, hospitalisation is recommended. The main complications



are thromboembolism, electrolyte imbalance and organ dysfunction. Thromboprophylaxis is started rapidly.

In severe or critical cases, the priority is to correct the intravascular deficit that leads to tissue hypoperfusion and, in critical situations, organ failure. Fluid resuscitation is initiated with balanced crystalloids (4). Paracentesis of the ascites may be indicated to reduce peritoneal pressure. The use of vasopressors such as dopaminergic agents has shown significant efficacy. (5). In rare cases, acute respiratory distress syndrome (ARDS) may occur. This must be treated with intubation and mechanical ventilation.

Multidisciplinary coordination with emergency physicians, gynaecologists and intensivists is required to manage OHSS.

Conclusion

This case highlights the challenges of managing OHSS and its complications in assisted reproductive treatments. A multidisciplinary and individualised approach is essential.

References

1) Olchowy, Anna, Cyprian Olchowy, Mateusz Łasecki, Rafał Mazur, Małgorzata Sierpowska, Marek Waligóra, et Mieszko Więckiewicz. « Ovarian Hyperstimulation Syndrome as a Growing Diagnostic Problem in Emergency Department Settings: A Case Report ». The Journal of Emergency Medicine 56, no 2 (février 2019): 217-21. https://doi.org/10.1016/j. jemermed.2018.11.004.



2) Lamazou, F., A. Legouez, V. Letouzey, M. Grynberg, X. Deffieux, C. Trichot, H. Fernandez, et R. Frydman. « Le syndrome d'hyperstimulation ovarienne : physiopathologie, facteurs de risque, prévention et prise en charge ». Journal de Gynécologie Obstétrique et Biologie de la Reproduction 40, no 7 (novembre 2011): 593-611. https://doi.org/10.1016/j. jgyn.2011.06.008.

3) Timmons, Douglas, Tim Montrief, Alex Koyfman, et Brit Long. « Ovarian Hyperstimulation Syndrome: A Review for Emergency Clinicians ». The American Journal of Emergency Medicine 37, no 8 (août 2019): 1577-84. https://doi.org/10.1016/j.ajem.2019.05.018.

4) Chen, Chin-Der, Ming-Ying Wu, Kuang-Han Chao, Yih-Ron Lien, Shee-Uan Chen, et Yu-Shih Yang. « Update on Management of Ovarian Hyperstimulation Syndrome ». Taiwanese Journal of Obstetrics and Gynecology 50, no 1 (mars 2011): 2-10. https://doi.org/10.1016/j. tjog.2011.01.014.

5) Budev, Marie M., Alejandro C. Arroliga, et Tommaso Falcone. « Ovarian Hyperstimulation Syndrome »: Critical Care Medicine 33, no Supplement (octobre 2005): S301-6. https://doi.org/10.1097/01.CCM.0000182795.31757. CE.



Posterior circulation stroke mistriaged as intoxication: A case report

Author

Jasper Tuboville – Emergency Department Heilig Hart Lier Koen De Feyter – Head of Emergency Department Heilig Hart Lier

Citation

Tuboville, J., De Feyter, K. Posterior circulation stroke mistriaged as intoxication: A case report.

Introduction

Posterior circulation stroke causes 20-25% of all ischemic stroke with an incidence of 18 per 100.000 person-years. (1) Posterior circulation stroke comes with significant morbidity and mortality if left untreated due to misdiagnosis. (2) The misdiagnosis of posterior circulation stroke is very common. Up to 28-59% of patients get misdiagnosed initially, which is approximately 2.5 times higher than with anterior circulation stroke. (3, 4) Diagnosis can be difficult due to the wide range of presenting symptoms that are often non-focal. (1) The main identified risk factors for misdiagnosis are patients presenting with visual or gait disturbances, sensory symptoms, nausea, dizziness, mild/nonspecific and transient symptoms, young age and vertebral artery dissection as a cause for the stroke. (3)

Setting – case report

A 32-year-old man was brought to the emergency department (ED) by ambulance personnel during the night with symptoms of nausea, vomiting, dizziness, occipital headache and a drunken gait. He was otherwise healthy



and had no relevant past medical history. Symptom onset was approximately 5 hours after going to sleep. Despite the patient's denial of alcohol, medication or drug abuse, he was triaged by the nurse in charge as a patient presenting with an intoxication.

On clinical examination (patient lying on a stretcher) the patient had difficulties with lying still, he was agitated and experienced bruxism. His pupils were equal and reactive to light (PEARL) but with exotropia of the left eye. There was no facial paralysis, he had a symmetrical shoulder elevation and a midline tongue protrusion. There was no muscle weakness or pronator drift. Sensation was reported to be less on the patient's left side of his body and face. The patient was talking with a slurred speech without dysphasia.

Urgent CT angiography of the head and neck (see figure 1) showed an acute occlusion of the left vertebral artery and a thrombus at the vertebrobasilar junction with a high suspicion of an underlying left vertebral artery dissection.



FIGURE 1

CT angiography showing an acute occlusion of the left vertebral artery and a thrombus at the vertebrobasilar junction.

frontiers

- 1. Right vertebral artery
- 2. Left vertebral artery occlusion

The patient was transferred to the Antwerp University Hospital (UZA) for an emergent endovascular thrombectomy (EVT). The procedure was successful and the patient almost fully recovered. At the moment of discharge, there was only minimal dyspraxia of the right hand and minimal dysarthria.

The underlying cause of the posterior circulation stroke was a dissection of the left vertebral artery, probably caused by repeated stretching exercises of the neck.

Discussion

Posterior circulation stroke may present in a very diverse manner with symptoms mimicking other diseases or intoxication, potentially making diagnosis hard. The nursing staff should receive continuous education on stroke recognition. Triage nurses should be aware of the different presenting symptoms of posterior circulation stroke and have a high level of suspicion. In their training, we must exchange the FAST (Face-Arm-Speech-Time) acronym for BE-FAST (Balance-Eyes-Face-Arm-Speech-Time) or FASTER (Face-Arm-Stability-Talking-Eyes-React) as they include symptoms of a posterior stroke. Triage nurses have a key function in providing high-quality care for stroke patients because early detection and recognition of posterior circulation stroke is important to offer patients time-sensitive treatments (thrombolysis or thrombectomy) and to prevent serious morbidity/mortality.

References

1. Sparaco M, Ciolli L, Zini A. Posterior circulation ischaemic stroke-a review part I: anatomy, aetiology and clinical presentations. Neurol Sci. 2019;40(10):1995-2006.



2. Pelletier J, Koyfman A, Long B. Pearls for the Emergency Clinician: Posterior Circulation Stroke. J Emerg Med. 2023;65(5):e414-e26.

3. Gurley KL, Edlow JA. Avoiding Misdiagnosis in Patients With Posterior Circulation Ischemia: A Narrative Review. Acad Emerg Med. 2019;26(11):1273-84.

4. Arch AE, Weisman DC, Coca S, Nystrom KV, Wira CR, 3rd, Schindler JL. Missed Ischemic Stroke Diagnosis in the Emergency Department by Emergency Medicine and Neurology Services. Stroke. 2016;47(3):668-73.



Fatal Sodium Nitrite Poisoning: Do we need Prehospital methylene blue?

Author

Orla Braun – Spoedgevallen, Universitair Ziekenhuis Leuven Jent Lievers – Spoedgevallen, Europaziekenhuizen, Brussel Marc Sabbe – Spoedgevallen, Universitair Ziekenhuis Leuven Cornelia Genbrugge – Spoedgevallen, Universitair Ziekenhuis Leuven Ken De Smet – Spoedgevallen, Universitair Ziekenhuis Leuven

Citation

Braun, O., Lievers, J., Sabbe, M., Genbrugge, C., De Smet, K. Fatal Sodium Nitrite Poisoning: Do we need Prehospital methylene blue?

Introduction

Sodium nitrite poisoning has recently emerged as a method of suicide and is sold online in so-called "suicide kits". The number of reported cases has increased in several countries over the past decade^{1,2}. The number of cases in Belgium remains unknown due to the lack of data, but a rise in cases could be expected. Sodium nitrite poisoning presents a significant therapeutic challenge and rapid treatment with its antidote, methylene blue, is crucial.

Case presentation

We discuss a case of a 27-year-old who ingested sodium nitrite to commit suicide, which resulted in rapid clinical deterioration and cardiac arrest following arrival of EMS. She was transported to the hospital with ongoing CPR for administration of methylene blue. Resuscitation efforts were



discontinued after 30 minutes due to refractory cardiac arrest with a nonshockable rhythm, the absence of myocardial contractility on TEE, and the poor prognosis related to irreversible hypoxic damage.

Discussion

Sodium nitrite enacts its toxicity through the formation of NO and methemoglobin resulting in vasodilation and tissue hypoxia³. Prehospital diagnosis may be suspected when there is a combination of cyanosis, pulse oximetry readings persistently around 85% despite oxygen therapy, the presence of brown-colored blood during venipuncture, and using a co-oximeter. Early treatment with methylene blue is critical, as it remains the primary and most effective antidote for life-threatening sodium nitrite poisoning⁴. Other therapies include exchange transfusions and ECMO. Prehospital administration of methylene blue is feasible as it does not require specific storage requirements and is simple to dose and administer⁵. Adverse effects of methylene blue could exceed risks in life-threatening poisoning. This case highlights the importance of the availability of methylene blue in the prehospital setting.

References

(1) Ceelen M, VPD, MSc, VDHK. Suïcide door middel van 'zelfdodingspoeders' een trendonderzoek op basis van registraties van forensischartsen, 2024 [Internet]. 2024 jan.

(2) McCann SD, Tweet MS, Wahl MS. Rising incidence and high mortality in intentional sodium nitrite exposures reported to US poison centers. Clin Toxicol. 2021;59(12):1264–9. doi:10.1080/15563650.2021.1905162





(3) Cosby K, Partovi KS, Crawford JH, et al. Nitrite reduction to nitric oxide by deoxyhemoglobin vasodilates the human circulation. Nat Med. 2003;9(12):1498–505. doi:10.1038/nm954

(4) Lavonas EJ, Akpunonu PD, Arens AM, et al. 2023 American Heart Association Focused Update on the Management of Patients With Cardiac Arrest or Life-Threatening Toxicity Due to Poisoning: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2023;148(16). doi:10.1161/ CIR.00000000001161

(5) Garcia-Galindo CA, Pepin LC, Olives TD, et al. Massive Sodium Nitrite Overdose: A Case for Prehospital Methylene Blue. Prehospital Emergency Care. 2024;28(7):970–4. doi:10.1080/10903127.2024.2357597


Hard to be a dick : A rare cause of priapism

Author

Jade Vranckx – Emergency Department, CHU Charleroi-Chimay, Charleroi, BEL, Pediatrics, CHIREC Hôpital Delta, Bruxelles, BEL Gilles Dosin – Urology, CHU HELORA, Nivelles, BEL Fabien Guerisse – Emergency Department, CHU Charleroi-Chimay, Charleroi, BEL

Citation

Vranckx, J., Dosin, G., Guerisse, F. Hard to be a dick : A rare cause of priapism.

Introduction

Priapism is a rare urological condition characterized by a persistent, painful erection unrelated to sexual arousal. It can be classified as ischemic or non-ischemic [1]. Ischemic priapism is more common and results from venous occlusion in the corpora cavernosa [1,2], while non-ischemic priapism, which is less frequent, occurs due to arterial leakage and often resolves spontaneously [1,4].

Case Presentation

A 55-year-old male presented to the Emergency Department with a painful erection that had started 24 hours earlier after sexual intercourse with an unknown partner who injected papaverine into his corpora cavernosa. Clinical examination revealed a turgid penis with a flaccid glans. Ischemic priapism following the papaverine injection was suspected. Cavernosal aspiration and saline irrigation under local anesthesia were performed, but they were unsuccessful, as were intra-cavernosal epinephrine injection and attempts at a caverno-glanular shunt. Blood from the corpora cavernosa was sent for gas analysis, revealing arterial blood, which led to a final diagnosis





of non-ischemic priapism. The patient was referred to an interventional radiology center, where a cavernous arterial fistula was identified using Doppler ultrasound and successfully embolized.

Discussion

Priapism is a severe urological emergency involving a persistent, painful erection not related to sexual arousal. It can be ischemic (low-flow) or non-ischemic (high-flow)[1]. Ischemic priapism accounts for over 95% of cases and is caused by venous occlusion in the corpora cavernosa, leading to blood pooling, ischemia, fibrosis, and permanent erectile dysfunction if not treated promptly [2]. It can be triggered by medications (e.g., papaverine), substance abuse (e.g., alcohol, cocaine), or hematologic conditions (e.g., sickle cell disease) [1,2]. Papaverine, a phosphodiesterase inhibitor, is used to induce vasodilation in the corpora cavernosa to treat impotence, but excessive use can lead to ischemic priapism [4]. First-line treatment for ischemic priapism includes pain management, followed by intracavernous injection of 🛛-adrenergic agonists (usually phenylephrine). Second-line options include cavernosal aspiration and saline irrigation, and surgical shunts may be required if conservative measures fail [1,2,3].

Non-ischemic priapism should be considered when first-line treatments for ischemic priapism fail. Diagnosis can be confirmed by blood gas analysis, which shows no hypoxia or acidosis in non-ischemic priapism [1,3]. Doppler ultrasound can also help identify arterial flow [5]. Non-ischemic priapism is caused by arterial leakage with preserved venous drainage, preventing compartment syndrome. It can result from perineal trauma (blunt or penetrant), anatomical abnormalities, or be idiopathic. The corpora cavernosa remains partially rigid, and pain is generally less severe. It often resolves spontaneously, and conservative management is usually sufficient. If symptoms persist, endovascular embolization is the gold standard. Overall, non-ischemic priapism has a better prognosis and no significant long-term complications [2,3].



Conclusions

This case highlights the importance of distinguishing between ischemic and non-ischemic priapism in patients with prolonged erections. When firstline treatments for ischemic priapism fail, non-ischemic priapism should be considered, even with prior use of medications or drugs. Blood gas analysis and Doppler ultrasound are essential diagnostic tools. While ischemic priapism requires urgent intervention to prevent tissue damage, nonischemic priapism often resolves spontaneously.

References

1. Burnett AL, Bivalacqua TJ: Priapism: current principles and practice. Urol Clin North Am. 2007, 34:631-42. 10.1016/j.ucl.2007.08.006

2. Salonia A, Eardley I, Giuliano F, et al.: European Association of Urology guidelines on priapism. Eur Urol. 2014, 65:480-9. 10.1016/j. eururo.2013.11.008.

3. Ericson C, Baird B, Broderick GA: Management of Priapism: 2021 Update. Urol Clin North Am. 2021, 48:565-576. 10.1016/j.ucl.2021.07.003

4. Lomas GM, Jarow JP: Risk factors for papaverine-induced priapism. J Urol. 1992, 147:1280-1. 10.1016/s0022-5347(17)37542-0

5. Von Stempel C, Walkden M, Kirkham A: Review of the role of imaging in the diagnosis of priapism. Int J Impot Res. 2024, 10.1038/s41443-024-00928-0



Global trends in prehospital ECPR and alternate delivery strategies: Is there potential in Belgium?

Author

De Smaele Lindsey* – Department of Emergency Medicine, University Hospital Ghent, Ghent, Belgium Winter Maxine* – Department of Emergency Medicine, University Hospital Ghent, Ghent, Belgium Peperstraete Harlinde – Department of Intensive Care, University Hospital Ghent, Ghent, Belgium

Citation

Lindsey, D.S., Maxine, W., Harlinde, P. Global trends in prehospital ECPR and alternate delivery strategies: Is there potential in Belgium?

Introduction

Extracorporeal Cardiopulmonary Resuscitation (ECPR) is a promising intervention for patients with refractory Out-of-Hospital Cardiac Arrest (OHCA). As global trends shift towards integration of prehospital ECPR, challenges remain in patient selection, logistics, and cost-effectiveness. The feasibility and potential of implementing prehospital ECPR within the current Belgian framework is explored in this scoping review.

Methods

This review followed the PRISMA extension for scoping review guidelines. Three online databases (Pubmed, Embase and Web of Science) were used to identify papers published from 2013 to January 2025. 30 reports were selected analysing the current knowledge and challenges of the delivery



strategies of prehospital ECPR. Additionally, the search was expanded by reviewing the references of relevant articles. Studies were included when three primary domains were considered: global trends, logistical challenges, and OHCA outcomes specific to Belgium. Exclusion criteria was data only considering in-hospital ECPR. A narrative synthesis was conducted to summarize the findings.

Results

Thirty studies were included in the review. The selection process can be found in Table 1 (PRISMA-ScR).

Several countries, including Japan, Australia, Germany, France, The Netherlands and the United States, have initiated the integration of prehospital ECPR (an overview can be found in Table 2). Rendezvous strategies, which involve the transportation of patients to ECMO centers, have been adopted to enhance access to this specialized treatment. However, the feasibility of prehospital ECPR still varies based on factors such as hospital volume, team training, and regional infrastructure (1,2,3 and 4). TABLE 1: Prisma-ScR



*Consider, If feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers)
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.



TABLE 2: Overview of the global trends and logistics in prehospital ECPR

Location	Team	Center of deployment	Availability	When dispatched
Paris, France	anesthesiolo- gist-intensivist or ED doctor, an anesthetic nurse, a para- medic	dispatched from the hospital	24/7, though nighttime coverage may require the paramedic to pick up the on- call physician	Age < 70 years, limiting epinephrine to a max of 5mg
Albuquerque, USA	critical care physician trained in cannulation and two paramedics	ambulance equipped for prehospital ECMO, dispatched from Fire Rescue Station with the physician and pre-primed ECMO circuit	weekdays from 8:00 AM to 5:00 PM	witnessed cardiac arrest, identification of suitable ECMO candidates by paramedics, transport time > 35 min to the nearest hospital
Kaiserslautern, GER	anesthesiolo- gist, a cardiac surgeon, and a clinical perfu- sionist	Not specified	Not specified	no-flow time <10 min, cardiac arrest due to hypothermia or intoxication, no severe comorbidities or dementia



Hachinohe, Japan	Two operators, one resuscitation team leader, one clinical engineer and one physician	MOREs ¹ unit consists of a vehicle with an attached tent where ECMO can be performed	Not specified	Not specified
Melbourne, AUS	Two ICU consultants and one experienced ICU paramedic	dispatched from an inner metropolitan Melbourne quaternary hospital	2 days per week between 8:30 - 17:00	adults <65 years, witnessed arrest, initial rhythm of VF/VT/PEA, no-flow time <5 min, time to start cannulation <45 min, criteria screened from EMS call
Minnesota, USA	One senior cannulating physician, 2 critical care- experienced paramedics/ nurses or physicians	The Mobile ECMO team meets at the nearest ECMO hospital (3 in total) and initiates ECMO in the ED. Once cannulated, the patient is taken to the cathlab, then transported to the single, centralized ECMO ICU.	24/7 mobile ECMO cannulation team	adults (18 - 75 years), VF/ VT OHCA, no ROSC following 3 shocks, LUCAS transfer time <30 min. Exclusion was nursing home residents, known DNR, significant bleeding, known terminal illness

¹ Mobile Operating Room for Emergency surgery (MOREs)



Several challenges hinder the widespread implementation of prehospital ECPR. These include patient selection criteria, logistical difficulties, and the need for highly specialized teams capable of rapidly initiating ECMO in the uncontrolled, prehospital environment. Inconsistent protocols across regions and institutions make standardization difficult. The risk of complications such as vascular injury, infection, and cannulation failure increases in the prehospital setting, where conditions are less controlled than in the hospital. Moreover, there is a lack of sufficient data on the cost-effectiveness of prehospital ECPR, with estimates of operating costs significantly higher than for standard CPR.

Belgium has a high density of emergency services throughout the country. Belgium's experience with ECPR is primarily limited to large hospitals, although a pilot study in Liege demonstrated that ECPR could be successfully implemented in low-volume ECMO centers, with a survival rate of 43%. The prehospital ECPR strategy faces challenges, including the geographic distribution of ECMO-capable hospitals and the need to minimize transport times. However, Belgium's Mobile Emergency Groups (MUGs) and existing infrastructure could potentially support the development of prehospital ECPR programs. Standardized data collection on OHCA and predictive modeling are essential to assess the feasibility of prehospital ECPR on a national scale.

Discussion

ECPR is indicated in only 5% of OHCA cases, making early bystander CPR and AED use critical to improving survival outcomes. Although prehospital ECPR shows potential, its implementation faces challenges such as resource constraints, logistical issues, and limited hospital-based programs. Further research, particularly in Belgium, is essential to identify the most effective strategy. Key initial steps include establishing a comprehensive OHCA registry and ensuring transparency in existing in-hospital ECPR data to create a standardized national approach.



References

(1) Richardson, S. A. C., Anderson, D., Burrell, A. J. C., Byrne, T., Coull, J., Diehl, A.,...Bernard, S. (2023). Pre-hospital ECPR in an Australian metropolitan setting: a single-arm feasibility assessment-The CPR, pre-hospital ECPR and early reperfusion (CHEER3) study. Scandinavian Journal of Trauma Resuscitation & Emergency Medicine, 31(1), Article 100. https://doi.org/10.1186/s13049-023-01163-0

(2) Kruit, N., Rattan, N., Tian, D., Dieleman, S., Burrell, A., & Dennis, M. (2023). Prehospital Extracorporeal Cardiopulmonary Resuscitation for Outof-Hospital Cardiac Arrest: A Systematic Review and Meta-Analysis. Journal of Cardiothoracic and Vascular Anesthesia, 37(5), 748-754. https://doi. org/10.1053/j.jvca.2022.12.004

(3) Wengenmayer, T., Tigges, E., & Staudacher, D. L. (2023). Extracorporeal cardiopulmonary resuscitation in 2023 [Review]. Intensive Care Medicine Experimental, 11(1). https://doi.org/10.1186/s40635-023-00558-8

(4) Miraglia, D., Almanzar, C., Rivera, E., & Alonso, W. (2021). Extracorporeal cardiopulmonary resuscitation for refractory cardiac arrest: A scoping review. *Journal of the American College of Emergency Physicians Open, 2*(1). https://doi.org/10.1002/emp2.12380



Accessibility and efficacy of the URG Dijon application: A comprehensive user experience analysis

Author

Ilinca Romocea – Resident Physician, Emergency Medicine, Dijon University Hospital Cristian Terec – Resident Physician, Emergency Medicine, Dijon University Hospital Matas Giedrius – Attending Physician, Emergency Medicine, Dijon University Hospital Patrick Ray – Professor, Attending Physician, Emergency Medicine, Dijon University Hospital

Citation

Romocea, I., Terec, C., Giedrius, M., Ray, P. Accessibility and efficacy of the URG Dijon application: A comprehensive user experience analysis.

Introduction

The URG Dijon mobile application encompasses over 120 validated protocols from the University Department of Emergency Medicine. Designed to enhance accessibility and adherence to standardized guidelines, the app saw rapid adoption following its January 2023 launch. This study aimed to evaluate user experience through perceived ease of use, clinical impact, and overall satisfaction, thus informing future development of digital healthcare tools.

Methods

A user survey was administered from January to December 2024, collecting both quantitative (e.g., ease-of-use ratings, user preferences) and qualitative data through a structured questionnaire. Additionally, usage metrics (e.g.,



the most accessed screens, geographical distribution) were extracted from the application platform. A comparative assessment was conducted against paper-based protocols, standard digital systems, and reference textbooks. One-sided binomial tests compared the proportion of respondents who viewed the app as more efficient or much more efficient than existing solutions to a 50% neutrality threshold. Statistical analysis used Python 3.8 with pandas, script.stats, statsmodels, and scipy.stats.

Results

Among 138 respondents, 53% were attending physicians, 27% residents, and 9% nurses. By December 2024, 4,400 users had adopted the app—twice the number one year earlier. Most users (69%) accessed URG Dijon via iOS, while 31% used Android. France accounted for 85% of the user base, followed by Algeria (3.5%), Morocco (1.9%), Tunisia (1%), and the United States (0.8%). The "Protocols" screen, consulted 45,600 times, emerged as the most visited feature. The average ease-of-use rating was 4.1/5, with 79% of participants preferring the application over paper protocols. Moreover, 85% reported improved decision-making, enhanced patient outcomes, and better team communication. Compared with paper-based protocols, 72% found the app more or much more efficient (p < 0.001), 79% deemed it faster or much faster than standard digital systems (p < 0.001).

Discussion

The URG Dijon application appears to optimize protocol accessibility and expedite clinical decision-making. Its widespread adoption suggests that a well-designed mobile platform can displace traditional resources without compromising quality. High satisfaction ratings also confirm the promise of digital apps for guiding evidence-based care. Future directions may include integrating URG Dijon with electronic health records and expanding functionalities, thereby enhancing training opportunities and promoting broader international use.



Carbon monoxide poisoning by hookah smoking

Author

Rhea Colvin, Hiba El banouti – CHU Charleroi-Chimay

Citation

Colvin, R., banouti, H.E. Carbon monoxide poisoning by hookah smoking.

Introduction

Hookah, shisha or waterpipe smoking use is gaining in popularity in Occidental countries. Shisha use is not a danger-free alternative to cigarettes, whether tobacco is used or not. Shisha smoking exposes users to higher levels of carbon monoxide (CO) compared to cigarette smoking. As far as we are aware, there are no published cases on CO poisoning by hookah smoking in Belgium.

Clinical case

We would like to share the case of a 26 year-old man found unconscious and fitting in the toilet of a shisha bar. He was the only person affected. On arrival of the pre-hospital team, his blood pressure was 126/74 mmHg, his heart rate 115/min, his saturation 96%, his blood glucose was 91 mg/dL and his temperature 35.6°c. CO monitoring devices were worn and were not triggered. The patient was admitted to the emergency department. The clinical examination of the patient was normal. The patient's initial routine blood tests and chest x-ray were both normal. A venous blood gas was performed showing a carboxyhaemoglobin level of 43.5 % (addendum 1). The patient was transferred to a hyperbaric oxygen centre. A two-hour session of hyperbaric oxygen therapy at 2.5 absolute atmospheres was administered without complications. The patient was subsequently discharged without neurological sequelae.



Discussion

Carbon monoxide poisoning by hookah smoking is due to incomplete combustion of charcoal in a closed circuit. Wearing environment CO detectors by prehospital staff helps with the diagnosis but they are not always triggered. A CO detector worn by the prehospital team will ring at 5ppm. CO poisoning has non-specific signs and symptoms. The method currently used is carboxyhaemoglobin measurement. The diagnosis relies on clinical suspicion, as this is not a routine test performed in the ED. A level inferior to 3% in non-smokers and inferior to 12% in smokers is considered normal (1). In this particular case, a level of 43.5% of COHb is well above the accepted cut-off (2).

Initial treatment of CO poisoning through shisha smoking involves immediately removing the source of CO production and administering high concentration normobaric oxygen. The half-life of COHb is 5-6 hours. High concentration normobaric oxygen can reduce the half-life of COHb to 90 minutes. Hyperbaric oxygen therapy (HBOT), can reduce the half-life to 20-30 minutes (3). HBOT increases dissolved oxygen, reducing hypoxia. The indication for hyperbaric oxygen is a level of COHb above 25% in nonpregnant patients (4), above 15% in a pregnant patients, signs of ischemic heart disease or severe neurological symptoms. HBOT should be started within 6 hours (5) post exposition. In Belgium the 2016 consensus allows treatment up to 12 hours post exposition.

Conclusion

With this article, we hope to highlight the link between shisha consumption and CO poisoning. Prevention by improved ventilation and electric waterpipes plays an important role in decreasing morbidity and mortality.

In the future, point-of-care infrared measurement of COHb on a drop of blood, and soon transcutaneous, may see the light of day. This could entirely change the diagnosis of CO poisoning. As this is not yet possible, clinical suspicion must remain high.



Addendum 1

Analyses		Résultats	Unités	Val. Réf.
GAZ SANGUIN				
Туре	Sang veir	селх		
pH	-	7.33		7,35 - 7.45
pCO2		43.8	mm Hg	32,0 - 45,0
pO2	-	18.1	mm Hg	83,0 - 108,0
Sat. O2 (mesurée)	-	35.2	%	95,0 - 99,0
Bicarbonate		22.6	mmol / L	22,0 - 26,0
Excès de base		-3,3	mmal / L	-3,0 - 3,0
Hémoglobine		16.6	g / dL	12,6 - 17,3
Carboxyhémoglobine	+	43.5	%	0,0 - 3,0
Mélhémoglabine		0.3	%	0.0 - 1.0
Sodium		142	mmal / L	136 - 145
Potassium	-	3.4	mmol / L	3,5 - 5,0
Chlore		100	mmol / L	98 - 107
Ca ionisé		1.19	mmal / L	1,1 - 1,3
Glycémie		91	mg / dL	70 - 100
Acide lactique	+	3.52	mmol / L	0.33 - 1.20

References

1. US Elsevier Health [Internet]. [cité 30 oct 2024]. Mosby's® Diagnostic and Laboratory Test Referenc - 9780323683555. Disponible sur: https:// www.us.elsevierhealth.com/mosbys-diagnostic-and-laboratory-testreference-9780323683555.html

2. Maalem R, Alali A, Alqahtani S. Tobacco hookah smoking-induced carbon monoxide poisoning: A case report of non-ambient exposure. Clin Case Rep. 7 mai 2019;7(6):1178-80.

3. Acceleration of Carbon Monoxide Elimination in Man by High Pressure Oxygen | Science [Internet]. [cité 12 août 2024]. Disponible sur: https://www. science.org/doi/10.1126/science.111.2894.652?url_ver=Z39.88-2003&rfr_ id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed

4. Hampson NB, Dunford RG, Kramer CC, Norkool DM. Selection criteria utilized for hyperbaric oxygen treatment of carbon monoxide poisoning. J Emerg Med. 1 mars 1995;13(2):227-31.

5. Jüttner B, Busch HJ, Callies A, Dormann H, Janisch T, Kaiser G, et al. S2k guideline diagnosis and treatment of carbon monoxide poisoning. GMS Ger Med Sci. 4 nov 2021;19:Doc13.

Where scientists empower society

Creating solutions for healthy lives on a healthy planet

frontiersin.org

Why publish with us?



Frontiers

Avenue du Tribunal-Fédéral 34 1005 Lausanne, Swizerland frontiersin.org

Contact us

+41 (0)21 510 17 00 frontiersin.org/about/contact