Covert brain infarction in Emergency Department patients: prevalence, clinical correlates, and treatment opportunities

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Study objective: Covert brain infarctions are focal lesions detected on brain imaging consistent with ischaemia in the absence of a history of overt stroke or neurologic dysfunction. Covert brain infarctions are associated with an increased risk of future stroke. We evaluated the prevalence of covert brain infarctions in patients undergoing computed tomography (CT) in the emergency department, as well as clinician response to the findings.

Methods: Patients aged more than 50 years who underwent CT of the head and were seen and discharged from our emergency department (ED) from January to September 2018 were identified. Patients with a history of stroke, or prior brain imaging with ischaemia, were excluded. Patient data and clinician response (patient notification, neurology referral and risk factor modification) were collected.

Results: We included 832 patients, with an average age of 62 years, and 50% of the patients were women. Covert brain infarctions were present in 11% of patients (n=95). Only 9% of patients with covert brain infarctions were clearly made aware of the finding. Of the patients with covert brain infarctions, 27% were already on aspirin and 28% on a statin. Aspirin was added for two patients, and statin medication was not started on any patient. The blood pressure medication was added or adjusted for two patients with covert brain infarctions. The neurology department was consulted for 9% of the patients with covert brain infarctions.

Conclusion: The prevalence of covert brain infarctions in patients older than 50 years presenting to the ED who underwent CT of the head and were subsequently discharged from the ED was 11%. Only 9% of these patients were made aware of the finding, with minimal intervention for stroke prevention at the time of their visit. Interventions targeting this population should be considered.

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COVID-19. Our objective was to analyse safety and efficacy of HBO₂ in the treatment of hypoxaemia in patients with COVID-19 and evaluate time to hypoxaemia correction.

**Methods:** This was a multicentre, open-label randomised controlled trial conducted in Buenos Aires, Argentina, between July and November 2020. Patients with COVID-19 and severe hypoxaemia (SpO₂ ≤ 90% despite oxygen supplementation) were assigned to receive either HBO₂ treatment or the standard treatment for respiratory symptoms for 7 days. HBO₂ treatment was planned for ≥5 sessions (1/day) for 90 min at 1.45 atmosphere absolute (ATA). Outcomes were time to normalise oxygen requirement to SpO₂ ≥ 93%, need for mechanical respiratory assistance, development of acute respiratory distress syndrome and mortality within 30 days. A sample size of 80 patients was estimated, with a planned interim analysis after determining outcomes on 50% of patients.

**Results:** The trial was stopped after the interim analysis. Forty patients were randomised, 20 in each group, age was 55.2 ± 9.2 years. At admission, frequent symptoms were dyspnoea, fever and odynophagia; SpO₂ was 85.1% ± 4.3% for the whole group. Patients in the treatment group received an average of 6.2 ± 1.2 HBO₂ sessions. Time to correct hypoxaemia was shorter in treatment group versus control group; median 3 days (interquartile range (IQR), 1.0–4.5) versus median 9 days (IQR, 5.5–12.5), respectively (p < 0.010). Odds ratio (OR) for recovery from hypoxaemia in the HBO₂ group at day 3 compared with the control group was 23.2 (95% confidence interval (CI), 1.6 to 329.6; p = 0.001) Treatment had no statistically significant effect on acute respiratory distress syndrome, mechanical ventilation or death within 30 days after admission.

**Conclusion:** Our findings support the safety and efficacy of HBO₂ in the treatment of COVID-19 and severe hypoxaemia.

**Trial registration number NCT04477954.**

Cannellotto M, Duarte M, Keller G, et al. Hyperbaric oxygen as an adjuvant treatment for patients with COVID-19 severe hypoxaemia: a randomised controlled trial. Emerg Med J 2021.

**Knowledge retention and usefulness of simulation exercises for disaster medicine – what do speciality trainees know and think?**

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**Introduction:** Disaster medicine education is an important but often neglected part of Emergency Medicine (EM) speciality trainees’ curriculum. It is especially neglected in limited resource environments (1), which, owing to poor infrastructure generally, are more likely to be affected by disasters than better resourced environments. Disaster medicine cannot be taught solely in a classroom and various methods are required to teach practical concepts. This study aims to look at Emergency speciality trainees’ perception of high-fidelity simulation and their needs with regard to Disaster Medicine Education.

**Methods:** This was a prospective cross-sectional cohort study involving 27 EM speciality trainees from the University of the Witwatersrand, who participated in a high-fidelity simulation and were given a questionnaire before and after the exercise. The questionnaire consisted of theory questions relating to disaster medicine as well as Emergency Speciality trainee’s perception of high-fidelity simulation and their needs with regard to Disaster Medicine Education.

**Results:** High-fidelity simulation does not increase theoretical knowledge of Disaster Medicine but it does increase perceived confidence. EM speciality trainees seek yearly training, beginning in their first year and choose high-fidelity simulation as their preferred method of training.

**Conclusion:** High-fidelity simulation is crucial to increasing the confidence of EM speciality trainees during their training. More research is needed to develop core competencies and methods of evaluating training. Reproduced with permission

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**Impact of pharmacist-led antimicrobial stewardship on appropriate antibiotic prescribing in the Emergency Department: a systematic review and meta-analysis**

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Study objective: The aim of this study was to evaluate the impact of pharmacist presence or pharmacist-led antimicrobial stewardship interventions on appropriate prescribing of antibiotics in the emergency department (ED).

**Methods:** Systematic review and meta-analysis following the Preferred Reporting Items for Systematic Reviews and
MetaQ3 Analyses guidelines were conducted. Studies describing the role of pharmacists and their association with antimicrobial stewardship in the ED were included. The comparator for pharmacist intervention was hours without a pharmacist present, preprotocol implementation and nonpharmacist culture follow-up.

**Results:** In total, 24 studies (9984 patients) were included in the qualitative synthesis, and 22 studies (5791 patients) had data for the primary outcome and were included for the quantitative assessment (meta-analysis). Appropriate prescribing of antibiotics Q4 was more likely with pharmacist intervention (22 studies; odds ratio (OR), 3.47; 95% confidence interval (CI), 2.39 to 5.03), particularly among patients with pneumonia (5 studies; OR, 3.74; 95% CI, 2.14 to 6.54) or urinary tract infection (4 studies; OR, 1.76; 95% CI, 1.24 to 2.50). Time to culture review was similar with or without pharmacist intervention. Time to appropriate antibiotic was shorter with pharmacist intervention (mean difference, 18.9 h; 95% CI, 11.9 to 25.9; \( p < 0.001 \)). Repeat ED visit for the same complaint was not significant (10 studies; OR, 0.65; 95% CI, 0.39 to 1.10).

**Conclusion:** Pharmacist presence and pharmacist-led antimicrobial stewardship interventions appear to be effective for the appropriate prescribing of antibiotics in adult patients presenting to EDs with a variety of infectious syndromes.

**Emergencias**
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**Point-of-care chest ultrasound to diagnose acute heart failure in emergency department patients with acute dyspnoea: diagnostic performance of an ultrasound-based algorithm**

Vauthier C, Chabannon M, Markarian T, Taillandy Y, Guillemet K, Krebs H, Bazarllette F, Muller L, Claret PG and Bobbia X

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http://emergencias.portalsemes.org/descargar/rendimiento-de-un-algoritmo-basado-en-ecografia-cardiopulmonar-a-la-cabecera-del-paciente-pocus-para-el-diagnostico-de-insuficiencia-cardiaca-aguda-en-pacientes-que-consultan-en-urgencias-por-disnea-aguda/

**Background and objective:** Cardiopulmonary ultrasound imaging can be useful for diagnosing acute heart failure (AHF). We aimed to evaluate the diagnostic performance of an algorithm based on point-of-care ultrasound (POCUS) in patients coming to the emergency department with acute dyspnoea.

**Methods:** Prospective analysis of a convenience sample of patients with acute dyspnoea in two hospital emergency departments. The POCUS algorithm included lung ultrasound findings and three echocardiographic measurements taken from an apical view of four chambers: mitral annular plane systolic excursion, Doppler mitral flow velocity, and tissue Doppler imaging of the lateral mitral annulus. The definitive diagnosis was made by two physicians blinded to the POCUS findings.

**Results:** A total of 103 adult patients with a mean (SD) age of 73 (12) years were included; about half (51 patients) were women. Forty-two patients (41%) were finally diagnosed with AHF. Interindividual agreement on the physicians’ diagnoses was good (\( k = 0.82 \)). The POCUS algorithm assigned an AHF diagnosis to 76 patients (74%); 56 of them (85%) were in sinus rhythm. The diagnostic performance indicators for the algorithm were as follows: area under the receiver operating characteristic curve, 0.94 (95% CI, 0.88–1.00); sensitivity 96% (95% CI, 78%–100%); specificity, 93% (95% CI, 81%–98%); positive predictive value, 85% (95% CI, 62%–100%); and negative predictive value, 98% (95% CI, 88%–100%).

**Conclusion:** The POCUS-based algorithm for diagnosing AHF performed well in patients coming to the emergency department with acute dyspnoea.

**Keywords:** Dyspnoea, acute heart failure, emergency medicine, health care systems, ultrasonography