Setmana del 16 al 22 d'abril. 47 articles

CPR AND COVID-19

1. Heart Rhythm. 2023 Apr 19:S1547-5271(23)02172-0. doi: 10.1016/j.hrthm.2023.04.014. Online ahead of print.
COVID-19 as a catalyst of disparities in out-of-hospital cardiac arrest.
Hulleman M(1), van der Werf C(2), Koster RW(2).
NO ABSTRACT AVAILABLE

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

1. Am J Emerg Med. 2023 Mar 12;69:114-120. doi: 10.1016/j.ajem.2023.03.009. Online ahead of print.
Digit preference and biased conclusions in cardiac arrest studies.
Lapostolle F(1), Schneider E(2), Agostinucci JM(3), Nadiras P(4), Martineau L(5), Metzger J(6), Bertrand P(7), Petrovic T(8), Vianu I(9), Adnet F(10).
ABSTRACT
BACKGROUND: In cardiac arrest (CA), time is directly predictive of patients' prognosis. The increase in mortality resulting from delayed cardiopulmonary resuscitation has been quantified minute by minute. Times reported in CA management studies could reflect a timestamping bias referred to as "digit preference". This phenomenon leads to a preference for certain numerical values (such as 2, 5, or 10) over others (such as 13). Our objective was to investigate whether or not digit preference phenomenon could be observed in reported times of the day related to CA management, as noted in a national registry. METHODS: We analyzed data from the French National Electronic Registry of Cardiac Arrests. We analyzed twelve times-of-the-day corresponding to each of the main steps of CA management reported by the emergency physicians who managed the patients in prehospital settings. We postulated that if CA occurred at random times throughout the day, then we could expect to see events related to CA management occurring at a similar rate each minute of each hour of the day, at a fraction of 1/60. We compared the fraction of times reported as multiples of 15 (0, 15, 30, and 45 - on the hour, quarters, half hour) with the expected fraction of 4/60 (i.e. 4 × 1/60). MAIN RESULTS: A total of 47,211 times-of-the-day in relation to 6131 CA were analyzed. The most overrepresented numbers were: 0, with 3737 occurrences (8% vs 2% expected, $p < 0.0001$) and 30, with 2807 occurrences (6% vs 2% expected, $p < 0.0001$). Times-of-the-day as multiples of 15 were overrepresented (22% vs 7% expected, $p < 0.0001$). CONCLUSION: Prospectively collected times were considerably influenced by digit preference phenomenon. Studies that are not based on automatic time recordings and that have not evaluated and considered this bias should be interpretated with caution.

2. Resuscitation. 2023 Apr 18:109797. doi: 10.1016/j.resuscitation.2023.109797. Online ahead of print.

Interaction between Bystander Sex and Patient Sex in Bystander Cardiopulmonary Resuscitation for Out-of-Hospital Cardiac Arrests.

Lee G(1), Sun Ro Y(2), Ho Park J(3), Jeong Hong K(4), Jun Song K(5), Do Shin S(6).

ABSTRACT

BACKGROUND: Bystander cardiopulmonary resuscitation (CPR) is a critical factor in improving out-of-hospital cardiac arrest (OHCA) survival. The aim of this study was to investigate the interaction effect of bystander sex and patient sex on the provision of bystander CPR. METHODS: This was a retrospective cohort study using national OHCA registry in Korea. The inclusion criteria were adult bystander-witnessed OHCA patients with presumed cardiac etiology from January 2016 to December 2020. The primary outcome was the provision of bystander CPR. Multivariable logistic regression and interaction analysis were conducted to evaluate the impact of bystander sex on bystander CPR provision based on patient sex. RESULTS: The study included 24,919 patients with OHCA, 58.2% with male-bystanders and 41.8% with female-bystanders. Female bystanders were less likely to perform bystander CPR than male bystanders (68.0% vs. 78.8%, adjusted OR (95% CI): 0.62 (0.58-0.66)). Among patients with CPR-trained bystanders, female bystanders had lower odds of bystander CPR (0.85 (0.73-0.97)). In the interaction analysis between bystander and patient sex, a significant difference was observed in the likelihood of bystander CPR according to the patient sex. Female bystanders had lower odds of bystander CPR than male bystanders for male patients (0.47 (0.43-0.50)). However, there were no significant differences between male and female bystanders for female patients (0.91 (0.88-1.07)). CONCLUSION: Female bystanders have a lower likelihood of providing bystander CPR than male bystanders. Additionally, an interaction was observed between bystander sex and patient sex in the providing bystander CPR, with the association being more pronounced in male OHCA patients.

3. Curr Opin Crit Care. 2023 Mar 21. doi: 10.1097/MCC.0000000000001037. Online ahead of print.

Head-up cardiopulmonary resuscitation.

Moore JC(1)(2).

ABSTRACT

PURPOSE OF REVIEW: The purpose of this review was to provide an overview of head-up (HUP) CPR physiology, relevant preclinical findings, and recent clinical literature. RECENT FINDINGS: Recent preclinical findings have demonstrated optimal hemodynamics and improved neurologically intact survival in animals receiving controlled head and thorax elevation with circulatory adjuncts. These findings are compared with animals in the supine position and/or receiving conventional CPR with the HUP position. There are few clinical studies of HUP CPR. However, recent studies have shown safety and feasibility of HUP CPR and improved near-infrared spectroscopy changes in patients with head and neck elevation. Additional observational studies have shown that HUP CPR performed with head and thorax elevation and circulatory adjuncts has a time-dependent association with survival to hospital discharge, survival with good neurological function, and return of spontaneous circulation. SUMMARY: HUP CPR is a new and novel therapy increasingly used in the prehospital setting and discussed in the resuscitation community. This review provides a relevant review of HUP CPR physiology and preclinical work, and recent clinical findings. Further clinical studies are needed to further explore the potential of HUP CPR.

4. Front Med (Lausanne). 2023 Mar 31;10:1145714. doi: 10.3389/fmed.2023.1145714. eCollection 2023.

Editorial: Technological advances in emergency medical services system, treatment, and prognostication for cardiac arrest.

Kuroda Y(1).

NO ABSTRACT AVAILABLE

5. Am J Emerg Med. 2023 Apr 11:S0735-6757(23)00198-5. doi: 10.1016/j.ajem.2023.04.010. Online ahead of print.
Reply to ms AJEM32267 "Comment on: Association between prehospital airway type and oxygenation and ventilation in out-of-hospital cardiac arrest".
Sanz-García A(1), Martín-Rodríguez F(2), López-Izquierdo R(3).
NO ABSTRACT AVAILABLE

6. EBioMedicine. 2023 Apr;90:104517. doi: 10.1016/j.ebiom.2023.104517. Epub 2023 Mar 7.
Out-of-hospital cardiac arrest: predict and then protect!
Spadafora L(1), Biondi-Zoccai G(2), Bernardi M(1).
NO ABSTRACT AVAILABLE

7. Curr Heart Fail Rep. 2023 Apr;20(2):129-137. doi: 10.1007/s11897-023-00596-z. Epub 2023 Mar 7.
Sudden Death in Men Versus Women with Heart Failure.
Martínez-Solano J(1), Martínez-Sellés M(2)(3).
ABSTRACT
PURPOSE OF REVIEW: Sudden cardiac death (SCD) represents the most feared complication of heart failure (HF). This review intends to provide insight on our current knowledge of sex differences in SCD mechanisms, prevention, and management in HF patients. RECENT FINDINGS: Women with HF present a better prognosis than men and have a lower incidence of SCD, irrespective of the presence of ischemic heart disease and age. The influence of sex hormones, sex differences in intracellular calcium handling, and a differential myocardial remodeling may explain such a gap between men and women. Both HF drugs and ventricular arrhythmias ablation seems also useful for the management of women at risk of SCD, but special care must be taken with the use of antiarrhythmic QT-prolonging drugs. However, implantable cardioverter defibrillator (ICD) use has not been shown to be equally effective in women than men. Sex-specific recommendations regarding SCD in HF are still lacking due to the scarcity of information and the under-representation of women in clinical trials. Further investigation is required to provide specific risk stratification models in women. Cardiac magnetic resonance imaging, genetics development, and personalized medicine will probably play an increasing role in this evaluation.

IN-HOSPITAL CARDIAC ARREST

1. Am J Hosp Palliat Care. 2023 Apr 20:10499091231171389. doi: 10.1177/10499091231171389. Online ahead of print.
Association of Frailty and Cardiopulmonary Resuscitation Outcomes in Older U.S. Veterans.
Tosi DM(1)(2), Fernandez MC(1), Oomrigar S(1), Burton LP(1), Hammel IS(1)(2), Quartin A(1)(3), Ruiz JG(1)(2).
ABSTRACT
Objectives: Determine the association between frailty and immediate survival of cardiopulmonary resuscitation (CPR) in older Veterans. Secondary outcomes: compare in-hospital mortality, duration of resuscitation efforts, hospital and intensive care unit (ICU) length of stay, neurologic outcomes, and discharge disposition between frail and non-frail Veterans. Methods: Retrospective cohort study including Veterans 50 years and older, who were "Full Code" and had in-hospital cardiac arrest between 7/1/2017 and 6/30/2020, at the Miami VAMC. Frailty Index for the VA (VA-FI) was used to determine frailty status. Immediate Survival was determined by return of spontaneous circulation (ROSC) and in-hospital mortality was determined by all-cause mortality. We compared outcomes

between frail and non-frail Veterans using chi-square test. After adjusting for age, gender, race, and previous hospitalizations, we used multivariate binomial logistic regression with 95% confidence intervals to analyze the relationship between immediate survival and frailty, and in-hospital mortality and frailty. Results: 91% Veterans were non-Hispanic, 49% Caucasian, 96% male, mean age 70.7 ± 8.5 years, 73% frail and 27% non-frail. Seventy-six (65.5%) Veterans had ROSC, without difference by frailty status (P = .891). There was no difference based on frailty status of in-hospital mortality, discharge disposition, or neurologic outcomes. Frail and non-frail Veterans had resuscitation efforts lasting the same amount of time. Conclusions and Implications: CPR outcomes were not different depending on frailty status in our Veteran population. With these results, we cannot use frailty - as measured by the VA-FI - as a prognosticator of CPR outcomes in Veterans.

2. Curr Opin Crit Care. 2023 Mar 21. doi: 10.1097/MCC.0000000000001035. Online ahead of print.
In-hospital cardiac arrest.
Soar J(1).
ABSTRACT
PURPOSE OF REVIEW: To describe our knowledge about in-hospital cardiac arrest (IHCA) including recent developments. RECENT FINDINGS: Improving trends in IHCA outcomes appear to have stalled or reversed since the COVID-19 pandemic. There are disparities in care based on patient sex, ethnicity and socioeconomic status that need to be tackled. The increased use of emergency treatment plans that include do-not attempt cardiopulmonary resuscitation recommendations will help to decrease the number of resuscitation attempts. System approaches and strong local leadership through resuscitation champions can improve patient outcomes. SUMMARY: In-hospital cardiac arrest is a global health problem with a 25% survival in high-income settings. There remain significant opportunities to both decrease the incidence of, and outcomes from IHCA.

3. Biotechnol Genet Eng Rev. 2023 Apr 17:1-11. doi: 10.1080/02648725.2023.2199239. Online ahead of print.
Effect of other venous access on cardiopulmonary resuscitation quality: A prospective, randomized, controlled trial.
Qin H(1), Wang L(1), Yu B(1), Xing D(1), Su J(1), Bai Z(1).
ABSTRACT
This randomized controlled study aimed to prospectively evaluate the application effects of other venous access in patients undergoing cardiopulmonary resuscitation. A total of 212 patients who underwent respiratory and cardiac arrest were randomly divided into peripheral intravenous (IV) access group (IV group, n = 69), femoral vein catheterization group (FVC group, n = 72), and internal jugular vein catheterization group (IJVC group, n = 71). The puncture time, first administration time, pressure interruption time caused by the establishment of fluid pathway, endotracheal intubation time, complications, ROSC time, and ETCO2 were recorded. The time of establishing venous access was: IV<FVC<IJVC. The once puncture success rate of the FVC group was markedly higher than that in IV and IJVC groups (P < 0.01). There was no significant difference in ROSC time between the FVC, IV, and the IJVC group (P = 0.23). The ROSC time in the FVC group was higher than in the IV and IJVC groups (P < 0.01). The success rate of ROSC in the FVC group and IJVC group were better than that in the IV group (PVC>IJVC>IV, P = 0.04). There was no significant difference in EtCO2 between the FVC, IV group, and IJVC group (PVC>IJVC>IV, P = 0.17). Due to catheterization, the time of suspending chest compression in the FVC group was significantly lower than in the IJVC group (5s vs. 12s). The time of establishing an artificial airway in the IV (38s) and FVC (35s) group were significantly longer than that in IJVC (52s) group. Central venous catheterization is more effective than peripheral venous catheterization in cardiopulmonary resuscitation. Moreover, femoral vein access was more effective than internal jugular vein access.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. Eur Heart J Cardiovasc Pharmacother. 2023 Apr 17:pvad028. doi: 10.1093/ehjcvp/pvad028. Online ahead of print.

Use of methylphenidate is associated with increased risk of out-of-hospital cardiac arrest in the general population: a nationwide nested case-control study.

Eroglu TE(1), Halili A(2)(3), Arulmuruganantha vadivel A(1), Coronel R(4), Kessing LV(5)(6), Fosbøl EL(7), Folke F(1)(6), Torp-Pedersen C(2)(8), Gislason GH(1)(6)(9).

ABSTRACT

AIM: Methylphenidate, a sympathomimetic drug prescribed to treat attention-deficit/hyperactivity disorder (ADHD), is associated with cardiovascular events, but few studies have explored the risk of out-of-hospital cardiac arrest (OHCA). We investigated whether methylphenidate use is associated with OHCA in the general population. METHODS: Using Danish nationwide registries, we conducted a nested case-control study with OHCA-cases of presumed cardiac causes and age/sex/OHCA-date matched non-OHCA controls from the general population. Conditional logistic regression models with adjustments for well-known risk factors of OHCA were employed to estimate the odds ratio (OR) of OHCA comparing methylphenidate use with no use of methylphenidate. RESULTS: The study population consisted of 46 578 OHCA-cases (median:72 years [IQR:62-81]), 68.8% men) and 232 890 matched controls. Methylphenidate was used by 80 cases and 166 controls, and was associated with increased OR of OHCA compared to non-users (OR:1.78[95%-CI:1.32-2.40]). The OR was highest in recent starters (OR≤180 days:2.59[95%-CI:1.28-5.23]). The OR of OHCA associated with methylphenidate use did not vary significantly by age (p-value interaction:0.37), sex (p-value interaction:0.94), and pre-existing cardiovascular disease (p-value interaction:0.27). Furthermore, the ORs remained elevated when we repeated the analyses in individuals without registered hospital-based ADHD (OR:1.85[95%-CI:1.34-2.55]), without severe psychiatric disorders (OR:1.98 [95%-CI:1.46-2.67]), without depression (OR:1.93: [95%-CI:1.40-2.65]), or in non-users of QT-prolonging drugs (OR:1.79[95%-CI:1.27-2.54]). CONCLUSION: Methylphenidate use is associated with an increased risk of OHCA in the general population. This increased risk applies to both sexes and is independent from age and the presence of cardiovascular disease.

END-TIDAL CO_2

1. Am J Emerg Med. 2023 Apr 13;69:92-99. doi: 10.1016/j.ajem.2023.04.014. Online ahead of print.

PCO(2) on arrival as a predictive biomarker in patients with out-of-hospital cardiac arrest.

Inoue F(1), Inoue A(2), Nishimura T(3), Takahashi R(3), Nakatani Y(3), Suga M(3), Kikuta S(3), Tada S(3), Maemura S(3), Matsuyama S(3), Ishihara S(3).

ABSTRACT

BACKGROUND: Treating patients with out-of-hospital cardiac arrest (OHCA) requires early prediction of outcome, ideally on hospital arrival, as it can inform the clinical decisions involved. This study evaluated whether partial pressure of carbon dioxide (PCO2) on arrival is associated with outcome at one month OHCA patients. METHODS: This was a single-center retrospective study of adult OHCA patients treated between January 2016 and December 2020. Outcomes were defined along the Cerebral Performance Category (CPC) scale. Primary outcome was mortality (CPC 5) at one month. Secondary outcomes were death or unfavorable neurological outcome (CPC 3-5) and unfavorable

neurological outcome (CPC 3-4) at one month. Multivariable analysis was adjusted for age, sex, witnessed cardiac arrest, bystander cardiopulmonary resuscitation, initial shockable rhythm, and time from call to emergency medical services to hospital arrival. RESULTS: Out of 977 OHCA patients in the study period, 19 were excluded because they were aged under 18 years, 79 because they underwent extracorporeal cardiopulmonary resuscitation, and 101 due to lack of PCO2 data. This study included 778 patients total; mortality (CPC 5) at one month was observed in 706 (90.7%), death or unfavorable neurological outcome (CPC 3-5) in 743 (95.5%), and unfavorable neurological outcome (CPC 3-4) in 37 (4.8%). In multivariable analysis, high PCO2 levels showed significant association with mortality (CPC 5) at one month (odds ratio [OR] [per 5 mmHg], 1.14; 95% confidence interval [CI], 1.08-1.21), death or unfavorable neurological outcome (CPC 3-5) (OR [per 5 mmHg], 1.29; 95% CI, 1.17-1.42), and unfavorable neurological outcome (CPC 3-4) (OR [per 5 mmHg], 1.21; 95% CI, 1.04-1.41).CONCLUSIONS: High PCO2 on arrival was significantly associated with mortality and unfavorable neurological outcome in OHCA patients.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

1. BMJ Open. 2023 Apr 17;13(4):e065061. doi: 10.1136/bmjopen-2022-065061.
Therapeutic effects of vasopressin on cardiac arrest: a systematic review and meta-analysis.
Yan W(1)(2), Dong W(3), Song X(1)(2), Zhou W(1)(2), Chen Z(3).
ABSTRACT
OBJECTIVE: To demonstrate the therapeutic effect of vasopressin as an alternative treatment for cardiac arrest. DESIGN: Systematic review and meta-analysis. METHODS: PubMed, EMBASE, the Cochrane Library and Web of Science were searched for randomised controlled trials. The intervention included administration of vasopressin alone or vasopressin combined with epinephrine or vasopressin, steroids and epinephrine (VSE) versus epinephrine combined with placebo as control group. The primary outcome was the return of spontaneous circulation (ROSC). The secondary outcomes included mid-term survival and mid-term good neurological outcome. We conducted subgroup analyses of the primary outcome based on different settings, different study drug strategies and different types of initial rhythm. RESULTS: Twelve studies (n=6718) were included, of which eight trials (n=5638) reported the data on patients with out-of-hospital cardiac arrest and four trials (n=1080) on patients with in-hospital cardiac arrest (IHCA). There were no significant differences between intravenous vasopressin and placebo in the outcomes of ROSC (relative risk (RR): 1.11; 95% CI: 0.99 to 1.26), mid-term survival (RR: 1.23; 95% CI: 0.90 to 1.66) and mid-term good neurological outcome (RR: 1.20; 95% CI: 0.77 to 1.87). However, in the subgroup analysis, intravenous vasopressin as part of VSE can significantly improve the rate of ROSC (RR: 1.32; 95% CI: 1.18 to 1.47) but not the rate of mid-term survival (RR: 2.15; 95% CI: 0.75 to 6.16) and mid-term good neurological outcome (RR: 1.80; 95% CI: 0.81 to 4.01) for patients with IHCA. CONCLUSIONS: Our study failed to demonstrate increased benefit from vasopressin with or without epinephrine

compared with the standard of care. However, vasopressin as a part of VSE is associated with the improvement of ROSC in patients with IHCA, and the benefit on mid-term survival or mid-term good neurological outcome is uncertain. Larger trials should be conducted in the future to address the effect of vasopressin only, vasopressin plus epinephrine or VSE on cardiac arrest.

2. Arch Cardiovasc Dis. 2023 Apr;116(4):234-235. doi: 10.1016/j.acvd.2022.02.005. Epub 2022 Mar 22.
Epinephrine use and initial non-shockable rhythm: Tools for predicting death and poor neurological outcome after an out-of-hospital cardiac arrest with a return of spontaneous circulation.
Vidal J(1), Delmas C(2), Vidal G(1), Houze Cerfon CH(1), Dubucs X(1), Balen F(3).
NO ABSTRACT AVAILABLE

3. Anesthesiology. 2023 Apr 19. doi: 10.1097/ALN.0000000000004592. Online ahead of print.
Epinephrine-induced effects on cerebral microcirculation and oxygenation dynamics using multimodal monitoring and functional photoacoustic microscopy.
Zhang D(1)(2), Wang W(3), Zhu X(1), Li R(3), Liu W(1), Chen M(1), Vu T(1), Jiang L(4), Zhou Q(4), Evans CL(3), Turner DA(3), Sheng H(3), Levy JH(3), Luo J(2), Yang W(3), Yao J(1), Hoffmann U(3)(5).
ABSTRACT
BACKGROUND: The administration of epinephrine after severe refractory hypotension, shock or cardiac arrest restores systemic blood flow and major vessel perfusion but may worsen cerebral microvascular perfusion and oxygen delivery through vasoconstriction. We hypothesized that epinephrine induces significant microvascular constriction in the brain, with increased severity after repetitive dosing and in the aged brain, eventually leading to tissue hypoxia. METHODS: We investigated the effects of intravenous epinephrine administration in healthy young and aged C57Bl/6 mice on cerebral microvascular blood flow and oxygen delivery using multimodal in vivo imaging, including functional photoacoustic microscopy, brain tissue oxygen sensing, and follow up histologic assessment. RESULTS: We report 3 main findings. First, after epinephrine administration, microvessels exhibited severe immediate vasoconstriction (57 ± 6% of baseline at 6 minutes, $p<0.0001$, n = 6) that outlasted the concurrent increase in arterial blood pressure, while larger vessels demonstrated an initial increase in flow (108 ± 6% of baseline at 6 minutes, $p = 0.02$, n = 6). Second, oxyhemoglobin decreased significantly within cerebral vessels with a more pronounced effect in smaller vessels (microvessels to 69 ± 8% of baseline at 6 minutes, $p<0.0001$, n = 6). Third, oxyhemoglobin de-saturation did not indicate brain hypoxia; on the contrary, brain tissue oxygen increased after epinephrine application (tissue PO_2 from 31 ± 11 at baseline to 56 ± 12 mmHg, 80% increase, $p = 0.01$, n = 12). In the aged brains, microvascular constriction was less prominent yet slower to recover compared to young brains, but tissue oxygenation was increased, confirming relative hyperoxia. CONCLUSIONS: Intravenous application of epinephrine induced marked cerebral microvascular constriction, intravascular hemoglobin de-saturation, and paradoxically, an increase in brain tissue oxygen levels, likely due to reduced transit time heterogeneity.

TRAUMA

No articles identified.

VENTILATION

1. Curr Opin Crit Care. 2023 Mar 28. doi: 10.1097/MCC.0000000000001033. Online ahead of print.
Airway management during cardiac arrest.
Penketh J(1), Nolan JP(1)(2).
ABSTRACT
PURPOSE OF REVIEW: Despite improvements over time, cardiac arrest continues to be associated with high rates of mortality and morbidity. Several methods can be used to achieve airway patency during cardiac arrest, and the optimal strategy continues to be debated. This review will explore and summarize the latest published evidence for airway management during cardiac arrest. RECENT FINDINGS: A large meta-analysis of out-of-hospital cardiac arrest (OHCA) patients found no difference in survival between those receiving tracheal intubation and those treated with a supraglottic airway (SGA). Observational studies of registry data have reported higher survival to hospital discharge in patients receiving tracheal intubation or an SGA but another showed no difference. Rates of intubation during in-hospital cardiac arrest have decreased in the United States, and different airway strategies appear to be used in different centres. SUMMARY: Observational studies continue to dominate the evidence base relating to cardiac arrest airway management. Cardiac arrest registries enable these observational studies to include many patients; however, the design of such studies introduces considerable bias. Further randomized clinical trials are underway. The current evidence does not indicate a substantial improvement in outcome from any single airway strategy.

CERERBRAL MONITORING

1. Eur J Neurosci. 2023 Apr 17. doi: 10.1111/ejn.15978. Online ahead of print.
Evaluation of the cognitive outcome after out-of-hospital cardiac arrest: the role of thalamus.
Carlier J(1)(2), Le Goff F(1), Pouliquen D(1), Bliaux E(1), Bioux S(1), Gerardin E(3), Cruypeninck Y(3)(4), Segobin S(5), Savouré A(6), Martinaud O(1)(5)(7).
ABSTRACT
Cardiac arrest survivors develop a variety of neuropsychological impairments and neuroanatomical lesions. The goal of this study is to evaluate if brain Voxel-Based Morphometry and lesional Magnetic Resonance Imaging (MRI) analyses performed in the acute phase of an Out-of-Hospital Cardiac Arrest (OHCA) can be sensitive enough to predict the persistence of neuropsychological disorders beyond three months. Survivors underwent a prospective brain MRI during the first month after an OHCA, and performed neuropsychological assessments at one and three months. According to the second neuropsychological assessment, survivors were separated into two subgroups, a deficit subgroup with persistent memory, executive functions, attention and/or praxis disorders (n = 11) and a preserved subgroup, disorders free (n = 14). Brain vascular lesion images were investigated and volumetric changes were compared with healthy controls. Correlations were discussed between brain MRI results, OHCA data, and the second neuropsychological assessment. Analyses of acute ischemic lesions did not reveal significant differences between the two subgroups (p = 0.35) and correlations with cognitive impairments could not be assessed. Voxel-Based Morphometry analyses revealed a global cerebral volume reduction for the two subgroups, and a clear decrease of the right thalamic volume for the deficit subgroup. It was associated with a cognitive dysexecutive syndrome represented by four executive indexes according to the "Groupe de Réflexion pour l'Evaluation des Fonctions EXécutives" criteria. The right thalamus atrophy seems to be more predictive than the vascular lesions, and more specific than a global cerebral volume reduction of post-OHCA neuropsychological executive disorders.

2. Neurocrit Care. 2023 Apr 20. doi: 10.1007/s12028-023-01721-5. Online ahead of print.

Monitoring of Brain Tissue Oxygen Tension in Cardiac Arrest: a Translational Systematic Review from Experimental to Clinical Evidence.

Battaglini D(1)(2), Bogossian EG(#)(3), Anania P(#)(4), Premraj L(5)(6), Cho SM(7), Taccone FS(3), Sekhon M(8), Robba C(1)(9).

ABSTRACT

BACKGROUND: Cardiac arrest (CA) is a sudden event that is often characterized by hypoxic-ischemic brain injury (HIBI), leading to significant mortality and long-term disability. Brain tissue oxygenation (PbtO2) is an invasive tool for monitoring brain oxygen tension, but it is not routinely used in patients with CA because of the invasiveness and the absence of high-quality data on its effect on outcome. We conducted a systematic review of experimental and clinical evidence to understand the role of PbtO2 in monitoring brain oxygenation in HIBI after CA and the effect of targeted PbtO2 therapy on outcomes. METHODS: The search was conducted using four search engines (PubMed, Scopus, Embase, and Cochrane), using the Boolean operator to combine mesh terms such as PbtO2, CA, and HIBI. RESULTS: Among 1,077 records, 22 studies were included (16 experimental studies and six clinical studies). In experimental studies, PbtO2 was mainly adopted to assess the impact of gas exchanges, drugs, or systemic maneuvers on brain oxygenation. In human studies, PbtO2 was rarely used to monitor the brain oxygen tension in patients with CA and HIBI. PbtO2 values had no clear association with patients' outcomes, but in the experimental studies, brain tissue hypoxia was associated with increased inflammation and neuronal damage. CONCLUSIONS: Further studies are needed to validate the effect and the threshold of PbtO2 associated with outcome in patients with CA, as well as to understand the physiological mechanisms influencing PbtO2 induced by gas exchanges, drug administration, and changes in body positioning after CA.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. PLoS One. 2023 Apr 18;18(4):e0282870. doi: 10.1371/journal.pone.0282870. eCollection 2023.

A retrospective study on epidemiological analysis of pre-hospital emergency care in Hangzhou, China.

Wang J(1), He Y(2)(3), Chen X(1), Chen M(2)(3), Tang C(1), Lu F(1), Qi M(2)(4)(5), Zhang J(1).

ABSTRACT

Out-of-hospital cardiac arrest (OHCA) is a leading cause of global mortality, with numerous factors influencing the patient survival rate and prognosis. This study aimed to evaluate the OHCA epidemiology in China and elaborate on the current Hangzhou emergency system status. This retrospective analysis was based on the medical history system of the Hangzhou Emergency Center registered from 2015-2021. We provided a detailed description of OHCA characteristics and investigated the factors affecting the success rate of emergency treatment in terms of epidemiology, causes of onset, bystander rescue, and outcome factors. We included 9585 out-of-hospital cardiac arrest cases, of which 5442 (56.8%) had evidence of resuscitation. Patients with underlying diseases constituted the vast majority (80.1%); trauma and physicochemical factors accounted for 16.5% and 3.4%, respectively. Only 30.4% of patients (about 80.0% of bystanders witnessed) received bystander first aid. The outcome rate of emergency doctors dispatched by emergency centres was significantly higher than doctors dispatched by hospitals. Additionally, physician's first-aid experience, emergency response time, emergency telephone availability, initial heart rhythm, out-

of-hospital defibrillation, out-of-hospital intubation, and using of epinephrine significantly can significantly improve the out-of-hospital return of spontaneous circulation in patients. All steps in pre-hospital care are important for patients, especially for bystander first aid and physician's first-aid experience. The popularity of first-aid training and the public emergency medical system are not potent enough. We should take those key factors into consideration when developing a pre-hospital care system for OHCA.

2. Perfusion. 2023 Apr 20:2676591231157273. doi: 10.1177/02676591231157273. Online ahead of print.

"Bridging the Gap" international ECLS training and simulation - evaluation of the 10th educational corner on EuroELSO congress 2022 in London, United Kingdom.

Cvetkovic M(1)(2), Antonini MV(3)(4), Rosenberg A(5), Meadows CI(6)(7), Dąbrowski M(8)(9), Puslecki M(10)(11), Fawzy Hassan I(12)(13), Fowles JA(14), O'Callaghan M(1), Stefaniak S(11), Riera J(15), Barrett NA(6)(16), Bělohlávek J(17), Di Nardo M(18), Hoskote A(1)(2), Swol J(19).

ABSTRACT

Introduction: Simulation training offers an authentic team-based learning opportunity without risk to real patients. The Educational Corner at the annual congress of the European Branch of Extracorporeal Life Support Organisation (EuroELSO) provided an opportunity for multiple simulation training sessions facilitated by experts from all over the world.Aim: We aimed to review the educational impact of EuroELSO Educational Corner and whether it provides a quality ECLS training to a wide spectrum of multidisciplinary international attendees utilising high and low fidelity simulation, workshops and hands on sessions. Methods: During the congress, 43 sessions were conducted dedicated to ECLS education with identified educational objectives. The sessions focused on management of adults and children on V-V or V-A ECMO. Adult sessions covered emergencies on mechanical circulatory support with management of LVAD and Impella, managing refractory hypoxemia on V-V ECMO, emergencies on ECMO, renal replacement therapy on ECMO, V-V ECMO, ECPR cannulation and performing perfect simulation. Paediatric sessions covered ECPR neck and central cannulation, renal replacement on ECMO, troubleshooting, cannulation workshop, V-V recirculation, ECMO for single ventricle, PIMS-TS and CDH, ECMO transport and neurological injury. Results: The Educational Corner was attended by more than 400 participants over the two congress days. Majority of responders (88%) reported that training sessions met the set educational goals and objectives and that this would change their current practice. Almost all (94%) reported that they received useful information and 95% would recommend the session to their colleagues. Conclusion: The Educational Corner, as an integral component of the annual EuroELSO congress, achieved the set educational goals and provided quality education based on the recipient survey. Structured multidisciplinary ECLS education with standardised curriculum and feedback is an important key step in delivering quality training to an international audience. Standardisation of European ECLS education remains an important focus of the EuroELSO.

3. BMC Emerg Med. 2023 Apr 17;23(1):43. doi: 10.1186/s12873-023-00812-y.

Resuscitation room management of patients with non-traumatic critical illness in the emergency department (OBSERvE-DUS-study).

Dziegielewski J(1), Schulte FC(1), Jung C(2), Wolff G(2), Hannappel O(3), Kümpers P(4), Bernhard M(5), Michael M(1).

ABSTRACT

BACKGROUND: Few studies address the care of critically ill non-traumatic patients in the emergency department (ED). The aim of this study was to assess the epidemiology, management, and outcome of these patients. METHODS: In this retrospective study, we identified and analyzed data from all

consecutive adult critically ill non-traumatic ED patients treated from March 2018 to February 2019. Patient characteristics, major complaint leading to admission, out-of-hospital, and in-hospital interventions and 30-day mortality were extracted from medical records of the electronic patient data management system. RESULTS: During the study period, we analyzed 40,764 patients admitted to the ED. Of these, 621 (1.5%) critically ill non-traumatic patients were admitted for life-threatening emergencies to the resuscitation room (age: 70 ± 16 years, 52% male). Leading problem on admission was disability/unconsciousness (D), shock (C), respiratory failure (B), airway obstruction (A), and environment problems (E) in 41%, 31%, 25%, 2%, and 1%, respectively. Out-of-hospital and in-hospital measures included: intravenous access (61% vs. 99%), 12-lead ECG (55% vs. 87%), invasive airway management (21% vs. 34%) invasive ventilation (21% vs. 34%), catecholamines (9% vs. 30%), arterial access (0% vs. 52%), and cardiopulmonary resuscitation (11% vs. 6%). The underlying diagnoses were mainly neurological (29%), followed by cardiological (28%), and pulmonological (20%) emergencies. The mean length of stay (LOS) in the resuscitation room and ED was 123 ± 122 and 415 ± 479 min, respectively. The 30-day mortality was 18.5%. CONCLUSION: The data describe the care of critically ill non-traumatic patients in the resuscitation room. Based on these data, algorithms for the structured care of critically ill non-traumatic patients need to be developed.

4. Sci Rep. 2023 Apr 13;13(1):6033. doi: 10.1038/s41598-023-33129-8.

Association between the Cardiac Arrest Hospital Prognosis (CAHP) score and reason for death after successfully resuscitated cardiac arrest.

Paul M(1)(2), Legriel S(3)(4)(5), Benghanem S(4)(6), Abbad S(3), Ferré A(3), Lacave G(3), Richard O(7), Dumas F(4)(8)(9)(10)(11), Cariou A(4)(6)(8)(9)(10).

ABSTRACT

Individualize treatment after cardiac arrest could potentiate future clinical trials selecting patients most likely to benefit from interventions. We assessed the Cardiac Arrest Hospital Prognosis (CAHP) score for predicting reason for death to improve patient selection. Consecutive patients in two cardiac arrest databases were studied between 2007 and 2017. Reasons for death were categorised as refractory post-resuscitation shock (RPRS), hypoxic-ischaemic brain injury (HIBI) and other. We computed the CAHP score, which relies on age, location at OHCA, initial cardiac rhythm, no-flow and low-flow times, arterial pH, and epinephrine dose. We performed survival analyses using the Kaplan-Meier failure function and competing-risks regression. Of 1543 included patients, 987 (64%) died in the ICU, 447 (45%) from HIBI, 291 (30%) from RPRS, and 247 (25%) from other reasons. The proportion of deaths from RPRS increased with CAHP score deciles; the sub-hazard ratio for the tenth decile was 30.8 (9.8-96.5; $p < 0.0001$). The sub-hazard ratio of the CAHP score for predicting death from HIBI was below 5. Higher CAHP score values were associated with a higher proportion of deaths due to RPRS. This score may help to constitute uniform patient populations likely to benefit from interventions assessed in future randomised controlled trials.

5. Nurs Open. 2023 Apr 21. doi: 10.1002/nop2.1766. Online ahead of print.

The living experience of surviving out-of-hospital cardiac arrest and spiritual meaning making.

Aristidou M(1), Karanikola M(2), Kusi-Appiah E(3), Koutroubas A(2), Pant U(3), Vouzavali F(4), Lambrinou E(2), Papathanassoglou E(3)(5).

ABSTRACT

AIM: To understand the meaning of surviving out of hospital cardiac arrest and its aftereffects among Greek-speaking survivors. DESIGN: Hermeneutical phenomenological method based on Martin Heidegger's philosophy. METHODS: Eight Greek-speaking out of hospital cardiac arrest survivors were recruited using purposive sampling method. Data collection and analysis using

the seven stages of hermeneutic analysis described by Diekelman. Data were collected through semi-structured personal interviews with open-ended questions. RESULTS: Analysis revealed five themes: 'The unexpected attack', 'Experiencing a different world: Transformation of Body, Time, Emotion and Sensation', 'Restoration of the re-embodied self', 'Life transformation' and 'Personal transformation'. The themes are commensurate with transcultural components of Near-Death Experiences. Surviving out of hospital cardiac arrest was perceived as a 'divine gift' and a chance to continue 'living in a more conscious and meaningful way'. Despite participants' physical and psychosocial challenges, the narratives highlighted a newly acquired deep appreciation for the joy of life, living and others. Construction of meaning and a heightened spirituality seem central in reconstructing life after out of hospital cardiac arrest survivors. PATIENT OR PUBLIC CONTRIBUTION: Out of hospital cardiac arrest survivors reflected and described in-depth on their lived experiences of out of hospital cardiac arrest through a 60- to 90-min interview. In addition, the participants provided their feedback on the interpretation of the findings, confirmed the study findings, and ensured that the analysis reflected aspects of their individual experiences and were true to them.

6. Resuscitation. 2023 Apr 18:109798. doi: 10.1016/j.resuscitation.2023.109798. Online ahead of print.

Determinants of survival in sudden cardiac arrest manifesting with pulseless electrical activity.

Holmstrom L(1), Chugh H(1), Uy-Evanado A(1), Salvucci A(2), Jui J(3), Reinier K(1), Chugh SS(4).

ABSTRACT

OBJECTIVE: The proportion of sudden cardiac arrests (SCA) manifesting with pulseless electrical activity (PEA) has increased significantly, and the survival rate remains lower than ventricular fibrillation (VF). However, a subgroup of PEA-SCA cases does survive and may yield key predictors of improved outcomes when compared to non-survivors. We aimed to identify key predictors of survival from PEA-SCA. METHODS: Our study sample is drawn from two ongoing community-based, prospective studies of out-of-hospital SCA: Oregon SUDS from the Portland, OR metro area (Pop. approx. 1 million; 2002-2017) and Ventura PRESTO from Ventura County, CA (Pop. approx. 850,000, 2015-2021). For the present sub-study, we included SCA cases with PEA as the presenting rhythm where emergency medical services (EMS) personnel attempted resuscitation. RESULTS: We identified 1,704 PEA-SCA cases, of which 173 (10.2%) were survivors and 1,531 (89.8%) non-survivors. Patients whose PEA-SCA occurred in a healthcare unit (16.9%) or public location (18.1%) had higher survival than those whose PEA-SCA occurred at home (9.3%) or in a care facility (5.7%). Young age, witness status, PEA-SCA location and pre-existing COPD/asthma were independent predictors of survival. Among witnessed cases the survival rate was 10% even if EMS response time was >10 minutes. CONCLUSIONS: Key determinants for survival from PEA-SCA were young age, witnessed status, public location and pre-existing COPD/asthma. Survival outcomes in witnessed PEA cases were better than expected, even with delayed EMS response.

7. Resusc Plus. 2023 Mar 31;14:100385. doi: 10.1016/j.resplu.2023.100385. eCollection 2023 Jun.

Interhospital variability in Out-of-Hospital cardiac arrest survival in a large metropolitan area.

Kotini-Shah P(1), Blum N(2), Khosla S(1), Weber J(3), Markul E(4), Tataris K(2), Campbell T(1), Vanden Hoek T(1), Del Rios M(5).

ABSTRACT

BACKGROUND: Out-of-hospital cardiac arrest (OHCA) survival varies widely across the United States. The impact of hospital OHCA volume and ST-elevation myocardial infarction (STEMI) Receiving Center (SRC) designation on survival is not fully understood. METHODS: This was a retrospective analysis of adult OHCA who survived to hospital admission reported to the Chicago Cardiac Arrest Registry to Enhance Survival (CARES) database from May 1, 2013 to December 31, 2019. Hierarchical

logistic regression models were generated and adjusted by hospital characteristics. Survival to hospital discharge (SHD) and cerebral performance category (CPC) 1-2 at each hospital were calculated after adjusting for arrest characteristics. Hospitals were assigned quartiles (Q1-Q4) based on total arrest volume to allow for comparison of SHD and CPC 1-2 between quartiles. RESULTS: 4,020 patients met inclusion criteria. 21 of the 33 Chicago hospitals included in this study were designated SRCs. Adjusted SHD and CPC 1-2 rates ranged from 27.3% to 37.0% and from 8.9% to 25.1%, respectively, by hospital. SRC designation did not significantly affect SHD (OR 0.96; 95% CI, 0.71-1.30) nor CPC 1-2 (OR 1.17; 95% CI, 0.74-1.84). OHCA volume quartiles did not significantly affect SHD (Q2: OR 0.94; 95% CI, 0.54-1.60; Q3: OR 1.30; 95% CI, 0.78-2.16; Q4: OR 1.25; 95% CI, 0.74-2.10) nor CPC 1-2 (Q2: OR 0.75; 95% CI, 0.36-1.54; Q3: OR 0.94; 95% CI, 0.48-1.87; Q4: OR 0.97; 95% CI, 0.48-1.97). CONCLUSION: Interhospital variability in both SHD and CPC 1-2 cannot be explained by hospital arrest volume nor SRC status. Further research is warranted to explore reasons for interhospital variability.

POST-CARDIAC ARREST TREATMENTS

1. Curr Opin Crit Care. 2023 Mar 21. doi: 10.1097/MCC.0000000000001036. Online ahead of print.
Coronary angiography after cardiac arrest.
Nikolaou NI(1).
ABSTRACT
PURPOSE OF REVIEW: Acute coronary syndromes represent the commonest cause of out-of-hospital cardiac arrest (OHCA) in adults. Coronary angiography (CAG) followed by percutaneous coronary intervention (PCI) has been established as the treatment strategy for these patients. In this review, we aim first to discuss the potential risks and expected benefits from it, the caveats in its implementation, and the current tools for patient selection. Then summarize the recent evidence on the group of patients without ST-segment elevation on post-return of spontaneous circulation (ROSC) ECG. RECENT FINDINGS: The implementation of this strategy still shows a wide variation among the various systems of care. The presence of ST-segment elevation on post-ROSC ECG remains the most reliable tool for patient selection for immediate CAG.A primary PCI strategy is currently recommended for patients with ST-segment elevation on post-ROSC ECG regardless of the conscious state of patients. Recently several randomised studies including patients without ST-segment elevation on post-ROSC ECG showed no benefit with immediate CAG compared to delayed/elective CAG. This has led to a substantial although not uniform change in current recommendations. SUMMARY: Recent studies show no benefit with immediate CAG in groups of patients without ST-segment elevation on post-ROSC ECG. Further refinements in selecting the appropriate patients for immediate CAG seem necessary.

2. Cardiol Rev. 2023 Apr 18. doi: 10.1097/CRD.0000000000000551. Online ahead of print.
Early Coronary Angiography in Patients With Out-of-Hospital Cardiac Arrest Without ST-Segment Elevation: A Systematic Review, Meta-Analysis, and Comparative Analysis of Studies.
Gupta R(1), Behnoush AH(2), Khalaji A(2), Malik AH(3), Goel A(3), Sreenivasan J(4), Bandyopadhyay D(3), Agrawal A(5), Frishman WH(3)(6), Aronow WS(3), Vyas AV(1), Patel NC(1).
ABSTRACT
Out-of-hospital cardiac arrest has a high mortality rate. Unlike ST-elevation myocardial infarction, the results of performing early coronary angiography (CAG) in non-ST-elevation myocardial infarction patients are controversial. This study aimed to compare early and nonearly CAG in this population, in addition to the identification of differences between randomized controlled trials (RCTs) and observational studies conducted in this regard. A systematic search in PubMed, Embase, and Cochrane library was performed to identify the relevant studies. Random-effect meta-analysis was done to calculate the pooled effect size of early versus nonearly CAG outcomes in all studies in

addition to each of the RCT and observational subgroups of the studies. The relative risk ratio (RR), along with its 95% confidence interval (CI), was used as a measure of difference. A total of 16 studies including 5234 cases were included in our analyses. Compared with observational cohorts, RCT studies had patients with higher baseline comorbidities (older age, hypertension, diabetes, and coronary artery disease). Random-effect analysis revealed a lower rate of in-hospital mortality in the early-CAG group (RR, 0.79; 95% CI, 0.65-0.97; P = 0.02); however, RCT studies did not find a statistical difference in this outcome (RR, 1.01; 95% CI, 0.83-1.23; P = 0.91). Moreover, mid-term mortality rates were lower in the early-CAG group (RR, 0.87; 95% CI, 0.78-0.98; P = 0.02), mostly due to observational studies. There was no significant difference between the groups in other efficacy and safety outcomes. Although early CAG was associated with lower in-hospital and mid-term mortality in overall analyses, no such difference was confirmed by the results obtained from RCTs. Current evidence from RCTs may not be representative of real-world patients and should be interpreted within its limitation.

3. Resusc Plus. 2023 Mar 31;14:100382. doi: 10.1016/j.resplu.2023.100382. eCollection 2023 Jun.
Performance of the systemic immune-inflammation index in predicting survival to discharge in out-of-hospital cardiac arrest.
Taha Sert E(1), Kokulu K(1), Mutlu H(1), Gül M(2), Uslu Y(3).
ABSTRACT
OBJECTIVE: To investigate whether the systemic immune-inflammatory index (SII) could be used as a prognostic marker of out-of-hospital cardiac arrest (OHCA). METHODS: We evaluated patients aged 18 years and older, who presented to the emergency department (ED) due to OHCA between January 2019 and December 2021 and achieved the return of spontaneous circulation after successful resuscitation. Routine laboratory tests were obtained from the first blood samples measured following the patients' admission to ED. The neutrophil-lymphocyte ratio (NLR) and platelet-lymphocyte ratio (PLR) were calculated by dividing the neutrophil and platelet counts by the lymphocyte count. SII was calculated as platelets × neutrophils / lymphocytes. RESULTS: Among the 237 patients with OHCA included in the study, the in-hospital mortality rate was 82.7%. The SII, NLR, and PLR values were statistically significantly lower in the surviving group than in the deceased group. The multivariate logistic regression analysis revealed that SII [odds ratio (OR): 0.68, 95% confidence interval (CI): 0.56-0.84, p = 0.004] was an independent predictor of survival to discharge. In the receiver operating characteristic analysis, the power of SII to predict survival to discharge [area under the curve (AUC): 0.798] was higher than either NLR (AUC: 0.739) or PLR (AUC: 0.632) alone. SII values below 700.8% predicted survival to discharge with 80.6% sensitivity and 70.7% specificity. CONCLUSION: Our findings showed that SII was more valuable than NLR and PLR in predicting survival to discharge and could be used as a predictive marker for this purpose.

TARGETED TEMPERATURE MANAGEMENT

1. J Intensive Care Med. 2023 Jun;38(6):544-552. doi: 10.1177/08850666221151014. Epub 2023 Jan 22.
Urine Output and Mortality in Patients Resuscitated from out of Hospital Cardiac Arrest.
Sarma D(1), Tabi M(2), Rabinstein AA(3), Kashani K(4)(5), Jentzer JC(2).
ABSTRACT
BACKGROUND: Limited data exist regarding urine output (UO) as a prognostic marker in out-of-hospital-cardiac-arrest (OHCA) survivors undergoing targeted temperature management (TTM). METHODS: We included 247 comatose adult patients who underwent TTM after OHCA between 2007 and 2017, excluding patients with end-stage renal disease. Three groups were defined based on mean hourly UO during the first 24 h: Group 1 (<0.5 mL/kg/h, n = 73), Group 2 (0.5-1 mL/kg/h, n = 81) and Group 3 (>1 mL/kg/h, n = 93). Serum creatinine was used to classify acute kidney injury

(AKI). The primary and secondary outcomes respectively were in-hospital mortality and favorable neurological outcome at hospital discharge (modified Rankin Scale [mRS]<3). RESULTS: In-hospital mortality decreased incrementally as UO increased (adjusted OR 0.9 per 0.1 mL/kg/h higher; p = 0.002). UO < 0.5 mL/kg/h was strongly associated with higher in-hospital mortality (adjusted OR 4.2 [1.6-10.8], p = 0.003) and less favorable neurological outcomes (adjusted OR 0.4 [0.2-0.8], p = 0.007). Even among patients without AKI, lower UO portended higher mortality (40% vs 15% vs 9% for UO groups 1, 2, and 3 respectively, p < 0.001). CONCLUSION: Higher UO is incrementally associated with lower in-hospital mortality and better neurological outcomes. Oliguria may be a more sensitive early prognostic marker than creatinine-based AKI after OHCA.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

1. CJEM. 2023 Apr;25(4):297-298. doi: 10.1007/s43678-023-00486-2. Epub 2023 Mar 26.
Defibrillation strategies for refractory ventricular fibrillation.
Bhat C(1), Yadav K(2)(3), Rosenberg H(2).
NO ABSTRACT AVAILABLE

2. J Electrocardiol. 2023 Apr 7;80:11-16. doi: 10.1016/j.jelectrocard.2023.04.002. Online ahead of print.
Instantaneous amplitude: Association of ventricular fibrillation waveform measures at time of shock with outcome in out-of-hospital cardiac arrest.
Jaureguibeitia X(1), Coult J(2), Sashidhar D(3), Blackwood J(4), Kutz JN(3), Kudenchuk PJ(5), Rea TD(6), Kwok H(7).
ABSTRACT
BACKGROUND: Prompt defibrillation is key to successful resuscitation from ventricular fibrillation out-of-hospital cardiac arrest (VF-OHCA). Preliminary evidence suggests that the timing of shock relative to the amplitude of the VF ECG waveform may affect the likelihood of resuscitation. We investigated whether the VF waveform amplitude at the time of shock (instantaneous amplitude) predicts outcome independent of other validated waveform measures. METHODS: We conducted a retrospective study of VF-OHCA patients ≥18 old. We evaluated three VF waveform measures for each shock: instantaneous amplitude at the time of shock, and maximum amplitude and amplitude spectrum area (AMSA) over a 3-s window preceding the shock. Linear mixed-effects modeling was used to determine whether instantaneous amplitude was associated with shock-specific return of organized rhythm (ROR) or return of spontaneous circulation (ROSC) independent of maximum amplitude or AMSA. RESULTS: The 566 eligible patients received 1513 shocks, resulting in ROR of 62.0% (938/1513) and ROSC of 22.3% (337/1513). In unadjusted regression, an interquartile increase in instantaneous amplitude was associated with ROR (Odds ratio [OR] [95% confidence interval] = 1.27 [1.11-1.45]) and ROSC (OR = 1.27 [1.14-1.42]). However, instantaneous amplitude was not associated with ROR (OR = 1.13 [0.97-1.30]) after accounting for maximum amplitude, nor with ROR (OR = 1.00 [0.87-1.15]) or ROSC (OR = 1.05 [0.93-1.18]) after accounting for AMSA. By contrast, AMSA and maximum amplitude remained independently associated with ROR and ROSC. CONCLUSIONS: We did not observe an independent association between instantaneous amplitude and shock-specific outcomes. Efforts to time shock to the maximal amplitude of the VF waveform are unlikely to affect resuscitation outcome.

PEDIATRICS AND CHILDREN

No articles identified.

EXTRACORPOREAL LIFE SUPPORT

1. Crit Care. 2023 Apr 18;27(1):144. doi: 10.1186/s13054-023-04432-7.
Extracorporeal cardiopulmonary resuscitation dissemination and integration with organ preservation in the USA: ethical and logistical considerations.
Schiff T(1), Koziatek C(2), Pomerantz E(3), Bosson N(4)(5)(6), Montgomery R(7)(8), Parent B(1)(7)(8), Wall SP(9)(10)(11).
ABSTRACT
Use of extracorporeal membrane oxygenation (ECMO) in cardiopulmonary resuscitation, termed eCPR, offers the prospect of improving survival with good neurological function after cardiac arrest. After death, ECMO can also be used for enhanced preservation of abdominal and thoracic organs, designated normothermic regional perfusion (NRP), before organ recovery for transplantation. To optimize resuscitation and transplantation outcomes, healthcare networks in Portugal and Italy have developed cardiac arrest protocols that integrate use of eCPR with NRP. Similar dissemination of eCPR and its integration with NRP in the USA raise novel ethical issues due to a non-nationalized health system and an opt-in framework for organ donation, as well as other legal and cultural factors. Nonetheless, eCPR investigations are ongoing, and both eCPR and NRP are selectively employed in clinical practice. This paper delineates the most pressing relevant ethical considerations and proposes recommendations for implementation of protocols that aim to promote public trust and reduce conflicts of interest. Transparent policies should rely on protocols that separate lifesaving from organ preservation considerations; robust, centralized eCPR data to inform equitable and evidence-based allocations; uniform practices concerning clinical decision-making and resource utilization; and partnership with community stakeholders, allowing patients to make decisions about emergency care that align with their values. Proactively addressing these ethical and logistical challenges could enable eCPR dissemination and integration with NRP protocols in the USA, with the potential to maximize lives saved through both improved resuscitation with good neurological outcomes and increased organ donation opportunities when resuscitation is unsuccessful or not in accordance with individuals' wishes.

2. J Am Coll Emerg Physicians Open. 2023 Apr 11;4(2):e12948. doi: 10.1002/emp2.12948. eCollection 2023 Apr.
Association between prehospital advanced life support by emergency medical services personnel and neurological outcomes among adult out-of-hospital cardiac arrest patients treated with extracorporeal cardiopulmonary resuscitation: A secondary analysis of the SAVE-J II study.
Yumoto T(1), Hongo T(1), Hifumi T(2), Inoue A(3), Sakamoto T(4), Kuroda Y(5), Yorifuji T(6), Nakao A(1), Naito H(1); SAVE-J II study group.
ABSTRACT
STUDY OBJECTIVE: Early deployment of extracorporeal cardiopulmonary resuscitation (ECPR) is critical in treating refractory out-of-hospital cardiac arrest (OHCA) patients who are potential candidates for ECPR. The effect of prehospital advanced life support (ALS), including epinephrine administration or advanced airway, compared with no ALS in this setting remains unclear. This study's objective was to determine the association between any prehospital ALS care and outcomes of patients who received ECPR with emergency medical services-treated OHCA. METHODS: This was a secondary analysis of data from the Study of Advanced Cardiac Life Support for Ventricular Fibrillation with Extracorporeal Circulation in Japan (SAVE-J) II study. Patients were separated into 2 groups-those who received prehospital ALS (ALS group) and those did not receive prehospital ALS (no ALS group). Multiple logistic regression analysis was used to investigate the association between

prehospital ALS and favorable neurological outcomes (defined as Cerebral Performance Category scores 1-2) at hospital discharge. RESULTS: A total of 1289 patients were included, with 644 patients in the ALS group and 645 patients in the no ALS group. There were fewer favorable neurological outcomes at hospital discharge in the ALS group compared with the no ALS group (10.4 vs 19.8%, p <0.001). A multiple logistic regression analysis revealed that any prehospital ALS care (adjusted odds ratios 0.47; 95% confidence interval 0.34-0.66; p <0.001) was associated with unfavorable neurological outcomes at hospital discharge. CONCLUSION: Prehospital ALS was associated with worse neurological outcomes at hospital discharge in patients treated with ECPR for OHCA. Further prospective studies are required to determine the clinical implications of these findings.

3. Perfusion. 2023 Apr 21:2676591231164878. doi: 10.1177/02676591231164878. Online ahead of print.

Outcome of massive pulmonary embolism treated only with extracorporeal membrane oxygenation and anticoagulation without thrombolytic therapy or surgical embolectomy.

Sim HT(1)(2), Jo MS(1), Chang YJ(1), Cho DG(1), Kim JW(3).

ABSTRACT

INTRODUCTION: Although thrombolytic therapy is the standard treatment for massive pulmonary thromboembolism (PTE), it is often ineffective in patients with circulatory collapse. Surgical embolectomy is another treatment option, but whether it is absolutely necessary is controversial. We sought to evaluate the outcomes of patients with massive PTE treated with intensive critical care including extracorporeal membrane oxygenation (ECMO) without thrombolytic therapy or surgical embolectomy. METHODS: We analyzed 39 patients who were treated for massive PTE from January 2011 to June 2019. Massive PTE was treated with anticoagulation and hemodynamic support at an intensive care unit. ECMO was applied in patients with circulatory collapse. The computed tomography (CT) obstruction index and the ratio of the right ventricle to left ventricle short-axis diameters (RV/LV) were measured using serial CT angiography to confirm changes in pulmonary emboli and RV strain. RESULTS: Twenty-one patients were in cardiogenic shock, and 15 of them needed cardiopulmonary resuscitation (CPR). Fifteen patients were treated with ECMO and nine of them were weaned successfully. The overall in-hospital mortality was 23% (9/39). On the follow-up CT scan after 6 months, residual PTE was observed in 10 patients and their median CT obstruction index was 6.25 % (range 2.5-35). The initial mean RV/LV ratio was 1.8 ± 0.47 and the value measured at follow-up CT decreased to less than 1 (0.9 ± 0.1). CONCLUSIONS: Intensive critical care with heparin alone and timely ECMO support without thrombolytic therapy could be an effective treatment option in patients with acute massive PTE.

4. Am J Health Syst Pharm. 2023 Apr 18:zxad077. doi: 10.1093/ajhp/zxad077. Online ahead of print.

Extracorporeal cardiopulmonary resuscitation: A primer for pharmacists.

Brown CS(1), Wieruszewski ED(1), Nei SD(2), Vollmer NJ(2), Mattson AE(2), Wieruszewski PM(3).

ABSTRACT

PURPOSE: To describe the use of mechanical circulatory support in the setting of cardiac arrest and summarize pharmacists' role in extracorporeal cardiopulmonary resuscitation (ECPR). SUMMARY: ECPR is increasingly used to reduce morbidity and improve mortality after cardiac arrest. ECPR employs venoarterial ECMO, which provides full circulatory perfusion and gas exchange in both adult and pediatric patients in cardiac arrest. After the emergency medicine team identifies potential candidates for ECPR, the ECMO team is consulted. If deemed a candidate for ECPR by the ECMO team, the patient is cannulated during ongoing standard cardiopulmonary resuscitation. A multidisciplinary team of physicians, nurses, perfusionists, pharmacists, and support staff is needed for successful ECPR. Pharmacists play a vital role in advanced cardiac life support (ACLS) prior to cannulation. Pharmacists intervene to make pharmacotherapy recommendations during ACLS, prepare medications, and administer medications as allowed by institutional and state regulations.

Pharmacists also provide pharmacotherapy support in the selection of anticoagulation agents, ongoing vasopressor administration during ECMO cannulation, and the optimization of medication selection in the peri-ECPR period. CONCLUSION: With the growing use of ECPR, pharmacists should be aware of their role in medication optimization during ECPR.

5. J Thorac Dis. 2023 Mar 31;15(3):1258-1266. doi: 10.21037/jtd-23-43.
Early computed tomography after extracorporeal cardiopulmonary resuscitation on in-hospital survival: a retrospective cohort study.
Tong H(1), Zhang X(1), Chen K(1), Hu W(2), Gu Q(2).
ABSTRACT
BACKGROUND: The role of computed tomography (CT) scans after extracorporeal membrane oxygenation (ECMO) implantation in patients with refractory cardiac arrest has not been frequently investigated. Early CT scan findings may have many meaningful findings and contribute significantly to patients' outcome. In this study, we sought to determine whether early CT scans in such patients indirectly improved in-hospital survival. METHODS: A computerized search of the electronic medical records systems of 2 ECMO centers was conducted. A total of 132 patients who had undergone extracorporeal cardiopulmonary resuscitation (ECPR) between September 2014 and January 2022 were included in the analysis. The patients were divided into 2 groups based on whether they underwent early CT scans (the treatment group) or did not undergo early CT scans (the control group). The findings of early CT scans and in-hospital survival were investigated. RESULTS: A total of 132 patients had undergone ECPR with 71 were male, 61were female and mean age: 48.0±14.3 years. Early CT scans did not improve patient's in-hospital survival [hazard ratio (HR): 0.705; P=0.357]. Overall, a smaller proportion of patients survived in the treatment group (22.5%) than the control group (42.6%; P=0.013). In total, 90 patients were matched in terms of age, initial shockable rhythm, Sequential Organ Failure Assessment (SOFA) score, cardiopulmonary resuscitation (CPR) duration, ECMO duration, percutaneous coronary intervention, and cardiac arrest location. In the matched cohort, fewer patients survived in the treatment group (28.9%) than the control group (37.8%; P=0.371), but the difference was not significant. According to a log-rank test, in-hospital survival did not differ significantly before and after matching (P=0.69, and P=0.63, respectively). Thirteen patients (18.3%) had complications during transportation, among which a drop in blood pressure was the most common. CONCLUSIONS: The in-hospital survival rate between treatment and control group was not different, however, early CT scan after ECPR could help clinicians to gain important information to guide clinical practice.

6. Front Med (Lausanne). 2023 Mar 30;10:1117214. doi: 10.3389/fmed.2023.1117214. eCollection 2023.
The effects of ECMO on neurological function recovery of critical patients: A double-edged sword.
Cai J(1)(2), Abudou H(1)(2), Chen Y(1)(2), Wang H(1)(2), Wang Y(1)(2), Li W(1)(2), Li D(1)(2), Niu Y(1)(2), Chen X(1)(2), Liu Y(1)(2), Li Y(1)(2), Liu Z(1)(2), Meng X(1)(2), Fan H(1)(2).
ABSTRACT
Extracorporeal membrane oxygenation (ECMO) played an important role in the treatment of patients with critical care such as cardiac arrest (CA) and acute respiratory distress syndrome. ECMO is gradually showing its advantages in terms of speed and effectiveness of circulatory support, as it provides adequate cerebral blood flow (CBF) to the patient and ensures the perfusion of organs. ECMO enhances patient survival and improves their neurological prognosis. However, ECMO-related brain complications are also important because of the high risk of death and the associated poor outcomes. We summarized the reported complications related to ECMO for patients with CA, such as north-south syndrome, hypoxic-ischemic brain injury, cerebral ischemia-reperfusion injury, impaired intracranial vascular autoregulation, embolic stroke, intracranial hemorrhage, and brain death. The exact mechanism of ECMO on the role of brain function is unclear. Here we review the pathophysiological mechanisms associated with ECMO in the protection of neurologic function in

recent years, as well as the ECMO-related complications in brain and the means to improve it, to provide ideas for the treatment of brain function protection in CA patients.

EXPERIMENTAL RESEARCH

1. Front Med (Lausanne). 2023 Apr 4;10:1177034. doi: 10.3389/fmed.2023.1177034. eCollection 2023.
Corrigendum: The combination of chest compression synchronized ventilation and aortic balloon occlusion improve the outcomes of cardiopulmonary resuscitation in swine.
Xu J(1)(2)(3), Khan ZU(1)(2)(3), Zhang M(1)(2)(3), Wang J(4), Zhou M(1)(4), Zheng Z(1)(2)(3), Chen Q(5), Zhou G(1)(2)(3), Zhang M(1)(2)(3).
NO ABSTRACT AVAILABLE

2. PLoS One. 2023 Apr 20;18(4):e0282943. doi: 10.1371/journal.pone.0282943. eCollection 2023.
Epicardial electrical heterogeneity after amiodarone treatment increases vulnerability to ventricular arrhythmias under therapeutic hypothermia.
Lin CY(1)(2), Chang TY(1)(2), Hu YF(1)(2)(3), Hsieh YC(4), Chen YJ(5), Yeh HI(6), Lin YJ(1)(2), Chang SL(1)(2), Lo LW(1)(2), Chao TF(1)(2), Chung FP(1)(2), Liao JN(1)(2), Tuan TC(1)(2), Chen SA(1)(2)(4)(7).
ABSTRACT
BACKGROUND: Amiodarone is commonly used during therapeutic hypothermia (TH) following cardiac arrest due to ventricular arrhythmias. However, electrophysiological changes and proarrhythmic risk after amiodarone treatment have not yet been explored in TH. METHODS: Epicardial high-density bi-ventricular mapping was performed in pigs under baseline temperature (BT), TH (32-34°C), and amiodarone treatment during TH. The total activation time (TAT), conduction velocity (CV), local electrogram (LE) duration, and wavefront propagation from pre-specified segments were analyzed during sinus rhythm (SR) or right ventricular (RV) pacing (RVP), along with tissue expression of connexin 43. The vulnerability to ventricular arrhythmias was assessed. RESULTS: Compared to BT, TH increased the global TAT, decreased the CV, and generated heterogeneous electrical substrate during SR and RVP. During TH, the CV reduction and LE duration prolongation were greater in the anterior mid RV than in the other areas, which changed the wavefront propagation in all animals. Compared to TH alone, amiodarone treatment during TH further increased the TAT and LE duration and decreased the CV. Heterogeneous conduction was partially attenuated after amiodarone treatment. After TH and amiodarone treatment, the connexin 43 expression in the anterior mid RV was lower than that in the other areas, compatible with the heterogeneous CV reduction. The animals under TH and amiodarone treatment had a higher incidence of inducible ventricular arrhythmias than those under BT or TH without amiodarone. CONCLUSION: Electrical heterogeneity during amiodarone treatment and TH was associated with vulnerability to ventricular arrhythmias.

3. Crit Care. 2023 Apr 22;27(1):161. doi: 10.1186/s13054-023-04454-1.
Hypertonic sodium lactate infusion reduces vasopressor requirements and biomarkers of brain and cardiac injury after experimental cardiac arrest.
Annoni F(1)(2), Su F(3)(4), Peluso L(3)(5)(6), Lisi I(7), Caruso E(7), Pischiutta F(7), Gouvea Bogossian E(3), Garcia B(3)(4), Njimi H(3), Vincent JL(3), Gaspard N(8)(9), Ferlini L(8), Creteur J(3), Zanier ER(7), Taccone FS(3)(4).
ABSTRACT
INTRODUCTION: Prognosis after resuscitation from cardiac arrest (CA) remains poor, with high morbidity and mortality as a result of extensive cardiac and brain injury and lack of effective

treatments. Hypertonic sodium lactate (HSL) may be beneficial after CA by buffering severe metabolic acidosis, increasing brain perfusion and cardiac performance, reducing cerebral swelling, and serving as an alternative energetic cellular substrate. The aim of this study was to test the effects of HSL infusion on brain and cardiac injury in an experimental model of CA. METHODS: After a 10-min electrically induced CA followed by 5 min of cardiopulmonary resuscitation maneuvers, adult swine (n = 35) were randomly assigned to receive either balanced crystalloid (controls, n = 11) or HSL infusion started during cardiopulmonary resuscitation (CPR, Intra-arrest, n = 12) or after return of spontaneous circulation (Post-ROSC, n = 11) for the subsequent 12 h. In all animals, extensive multimodal neurological and cardiovascular monitoring was implemented. All animals were treated with targeted temperature management at 34 °C. RESULTS: Thirty-four of the 35 (97.1%) animals achieved ROSC; one animal in the Intra-arrest group died before completing the observation period. Arterial pH, lactate and sodium concentrations, and plasma osmolarity were higher in HSL-treated animals than in controls ($p < 0.001$), whereas potassium concentrations were lower ($p = 0.004$). Intra-arrest and Post-ROSC HSL infusion improved hemodynamic status compared to controls, as shown by reduced vasopressor requirements to maintain a mean arterial pressure target > 65 mmHg ($p = 0.005$ for interaction; $p = 0.01$ for groups). Moreover, plasma troponin I and glial fibrillary acid protein (GFAP) concentrations were lower in HSL-treated groups at several time-points than in controls. CONCLUSIONS: In this experimental CA model, HSL infusion was associated with reduced vasopressor requirements and decreased plasma concentrations of measured biomarkers of cardiac and cerebral injury.

4. Pediatr Emerg Care. 2023 Apr 21. doi: 10.1097/PEC.0000000000002941. Online ahead of print.
Self-Efficacy in the Cannulation Technique for Intraosseous Access in Pediatric Cardiac Arrest: Egg Versus Bone.
Márquez-Hernández VV, Gutiérrez-Puertas L, García-Viola A(1), Garrido-Molina JM(2), Gutiérrez-Puertas V(3), Aguilera-Manrique G, Rodríguez-García MC.
ABSTRACT
OBJECTIVES: The use of intraosseous (IO) access is recommended in cardiac arrest when peripheral venous access is not accessible. Various methodologies exist that are used for teaching and learning about cannulation of the IO route both in education and in research. The purpose of the present study was to compare self-efficacy in the cannulation technique for IO access through different techniques. METHODS: A randomized comparative study was conducted. A total of 118 nursing students participated. The participants were randomly distributed into 2 intervention groups: chicken bone and egg. A checklist was used for data collection to evaluate the IO cannulation technique in nursing students and another to analyze self-efficacy. RESULTS: The average total score of self-efficacy for all participants was 8.84 (standard deviation (SD) = 0.98). No statistically significant differences were found when comparing the total self-efficacy score and the intervention group ($U = 1604.500$; $z = -0.733$; $P = 0.463$). No statistically significant differences were found between both groups for the average total score of the procedure ($U = 6916.500$; $z = -0.939$; $P =$

0.348). The egg group carried out the IO cannulation procedure in a significantly less amount of time (M = 126.88, SD = 82.18) than the chicken bone group (M = 183.77, SD = 108.28), finding statistically significant differences (U = 4983.500; z = -5.326; P < 0.001). CONCLUSIONS: Using an egg to teach and learn about IO access could be considered a methodology that is equally effective as using a chicken bone, with the advantage of achieving IO access in a lesser amount of time.

5. Shock. 2023 Apr 19. doi: 10.1097/SHK.0000000000002132. Online ahead of print.
Effects of M101-an extracellular hemoglobin-applied during cardiopulmonary resuscitation: An experimental rodent study.
Iten M(1), Glas M, Kindler M, Ostini A, Nansoz S, Haenggi M.
ABSTRACT
During and immediately after cardiac arrest, cerebral oxygen delivery is impaired mainly by microthrombi and cerebral vasoconstriction. This may narrow capillaries so much that it might impede the flow of red blood cells and thus oxygen transport. The aim of this proof-of-concept study was to evaluate the effect of M101, an extracellular hemoglobin-based oxygen carrier (Hemarina SA, Morlaix, France) derived from Arenicola marina, applied during cardiac arrest in a rodent model, on markers of brain inflammation, brain damage and regional cerebral oxygen saturation.27 Wistar rats subjected to 6 min of asystolic cardiac arrest were infused M101 (300 mg/kg) or placebo (NaCl 0.9%) concomitantly with start of cardiopulmonary resuscitation. Brain oxygenation and five biomarkers of inflammation and brain damage (from blood, cerebrospinal fluid, and homogenates from four brain regions) were measured 8 hours after return of spontaneous circulation. In these 21 different measurements, M101-treated animals were not significantly different from controls except for phospho-tau (p-tau) only in single cerebellum regions (p = 0.048; ANOVA of all brain regions: p = 0.004). Arterial blood pressure increased significantly only at 4-8 min after return of spontaneous circulation (p < 0.001) and acidosis decreased (p = 0.009).While M101 applied during cardiac arrest did not significantly change inflammation or brain oxygenation, the data suggest cerebral damage reduction due to hypoxic brain injury, measured by p-tau. Global burden of ischemia appeared reduced since acidosis was less severe. Whether post-cardiac arrest infusion of M101 improves brain oxygenation is unknown and needs to be investigated.

CASE REPORTS

1. JACC Case Rep. 2023 Feb 13;11:101769. doi: 10.1016/j.jaccas.2023.101769. eCollection 2023 Apr 5.
An Esophagopleural Fistula Related to Cardiopulmonary Resuscitation.
Mafi D(1), Legriel S(1)(2)(3), Charbonnel C(4), Benghalia K(5), Zavastin C(6), Glorion M(7), Paul M(1)(2).
ABSTRACT
We describe a previously unreported and potentially fatal complication of esophageal perforation following cardiopulmonary resuscitation in a 74-year-old man with cardiac arrest subsequent to ventricular tachycardia caused by ischemic heart disease. We discuss the importance of searching for severe traumatic complications. This description emphasizes presenting complaints, early recognition, and management strategies of such cases (Level of Difficulty: Intermediate).

2. Am J Emerg Med. 2023 Apr 5:S0735-6757(23)00188-2. doi: 10.1016/j.ajem.2023.04.003. Online ahead of print.
QT prolongation, torsades des pointes, and cardiac arrest after 4 mg of IV ondansetron.
Orozco BS(1), Lee SC(2), Fuchs RT(3), Fushianes GD(4), Cole JB(5).

ABSTRACT
Ondansetron is a commonly used antiemetic in the emergency department despite a 2011 FDA warning regarding dose-related QTc prolongation and torsades des pointes (TdP). Cases of TdP from small ondansetron doses administered in the emergency department are lacking. A 41-year-old-woman with alcohol use disorder on no medications or supplements presented to an emergency department with one day of nausea, vomiting, and epigastric pain. Examination revealed a pulse of 77 beats/min and epigastric tenderness. The patient received 4 mg IV ondansetron, 30 mg IV ketorolac, and was placed on cardiac monitoring. ECG obtained one minute after ondansetron demonstrated premature ventricular contractions with QTc = 653 ms. Thirteen minutes after receiving ondansetron she suffered TdP and cardiac arrest. She received immediate CPR and IV epinephrine with successful defibrillation at one minute. She then received IV magnesium. Post-arrest ECGs demonstrated persistent QTc prolongation immediately and at three hours post-arrest. Laboratory studies, drawn prior to arrest, demonstrated hypokalemia (3.2 mEq/L), hypomagnesemia (1.3 mg/dL), and elevated lipase (4918 IU/L). She received no additional QT-prolonging agents. Transthoracic echocardiogram and troponins were normal; ECG intervals completely normalized within 12 h and she was discharged neurologically intact. The patient returned 18 months later with recurrent pancreatitis and similar electrolyte abnormalities; QT-prolonging drugs were avoided at that time and her course was uncomplicated. QT prolongation with subsequent torsades des pointes and cardiac arrest may occur in high-risk patients receiving small doses of ondansetron. Further studies are warranted to determine the safest antiemetic for use in the emergency department.

3. Perfusion. 2023 Apr 19:2676591231170480. doi: 10.1177/02676591231170480. Online ahead of print.

Fulminant myocarditis following SARS-CoV-2 mRNA vaccination rescued with venoarterial ECMO: A report of two cases.

Vila-Olives R(1), Uribarri A(1)(2), Martínez-Martínez M(3)(4), Argudo E(3)(4), Bonilla C(3)(4), Chiscano L(3)(4), Herrador L(1), Gabaldón A(5), Irene Buera(1)(2), Vidal M(1), De la Iglesia A(1), Díaz MÁ(1), López E(3), Font M(3), Barrabés JA(1)(2), Riera J(3)(4), Ferreira-González I(1)(2), Ferrer R(3)(4).

ABSTRACT
INTRODUCTION: Cases of myocarditis after COVID-19 messenger RNA (mRNA) vaccines administration have been reported. Although the majority follow a mild course, fulminant presentations may occur. In these cases, cardiopulmonary support with venoarterial extracorporeal membrane oxygenation (V-A ECMO) may be needed. RESULTS: We present two cases supported with V-A ECMO for refractory cardiogenic shock due to myocarditis secondary to a mRNA SARS-CoV2 vaccine. One of the cases was admitted for out-of-hospital cardiac arrest. In both, a peripheral V-A ECMO was implanted in the cath lab using the Seldinger technique. An intra-aortic balloon pump was needed in one case for left ventricle unloading. Support could be successfully withdrawn in a mean of five days. No major bleeding or thrombosis complications occurred. Whereas an endomyocardial biopsy was performed in both, a definite microscopic diagnosis just could be reached in one of them. Treatment was the same, using 1000mg of methylprednisolone/day for three days. A cardiac magnetic resonance was performed ten days after admission, showing a significant improvement of the left ventricular ejection fraction and diffuse oedema and subepicardial contrast intake in different segments. Both cases were discharged fully recovered, with CPC 1. CONCLUSIONS: COVID-19 vaccine-associated fulminant myocarditis has a high morbidity and mortality but presents a high potential for recovery. V-A ECMO should be established in cases with refractory cardiogenic shock during the acute phase.

4. Arch Dis Child Fetal Neonatal Ed. 2023 May;108(3):319. doi: 10.1136/archdischild-2020-320532. Epub 2021 Aug 19.

Resuscitation of a preterm infant with massive air embolism.

Hentschel R(1), Müller C(2), Hock S(2), Uhl M(3).

NO ABSTRACT AVAILABLE