

CPR AND COVID-19

1. PLoS One. 2022 Sep 14;17(9):e0274314. doi: 10.1371/journal.pone.0274314. eCollection 2022.

Impact of COVID-19 on out-of-hospital cardiac arrest: A registry-based cohort-study from the German Resuscitation Registry.

Ristau P(1), Wnent J(1)(2)(3), Gräsner JT(1)(2), Fischer M(4), Bohn A(5)(6), Bein B(7), Brenner S(8), Seewald S(1)(2).

ABSTRACT

INTRODUCTION: The global COVID-19 pandemic affects people and the health system. Some international studies reported an increasing number of out-of-hospital cardiac arrest (OHCA). Comparable studies regarding the impact of COVID-19 on incidence and outcome of OHCA are not yet available for Germany. **MATERIALS AND METHODS:** This epidemiological study from the German Resuscitation Registry (GRR) compared a non-pandemic period (01.03.2018-28.02.2019) and a pandemic period (01.03.2020-28.02.2021) regarding the pandemic-related impact on OHCA care. **RESULTS:** A total of 18,799 cases were included. The incidence of OHCA (non-pandemic 117.9 vs. pandemic period 128.0/100,000 inhabitants) and of OHCA with resuscitation attempted increased (66.0 vs. 69.1/100,000). OHCA occurred predominantly and more often at home (62.8% vs. 66.5%, $p < 0.001$). The first ECG rhythm was less often shockable (22.2% vs. 20.3%, $p = 0.03$). Fewer cases of OHCA were observed (58.6% vs. 55.6% $p = 0.02$). Both the bystander resuscitation rate and the proportion of telephone guided CPR remained stable (38.6% vs. 39.8%, $p = 0.23$; and 22.3% vs. 22.5%, $p = 0.77$). EMS arrival times increased (08:39 min vs. 09:08 min, $p < 0.001$). Fewer patients reached a return of spontaneous circulation (ROSC) (45.4% vs. 40.9%, $p < 0.001$), were admitted to hospital (50.2% vs. 45.0%, $p < 0.001$), and discharged alive (13.9% vs. 10.2%, $p < 0.001$). **DISCUSSION:** Survival after OHCA significantly decreased while the bystander resuscitation rate remained stable. However, longer EMS arrival times and fewer cases of witnessed OHCA may have contributed to poorer survival. Any change to EMS systems in the care of OHCA should be critically evaluated as it may mean a real loss of life-regardless of the pandemic situation.

2. J Am Coll Emerg Physicians Open. 2022 Sep 5;3(5):e12811. doi: 10.1002/emp2.12811. eCollection 2022 Oct.

Estimating the impact of the COVID-19 pandemic on out-of-hospital cardiac arrest burden of disease in the United States.

Coute RA(1), Nathanson BH(2), Kurz MC(1)(3), Mader TJ(4); CARES Surveillance Group.

ABSTRACT

BACKGROUND: The impact of the COVID-19 pandemic on out-of-hospital cardiac arrest (OHCA) burden of disease in the United States is unknown. We sought to estimate and compare disability-adjusted life years (DALYs) lost because of OHCA during the COVID-19 pandemic to prepandemic values. **METHODS:** DALY were calculated as the sum of years of life lost (YLL) and years lived with disability (YLD). Adult non-traumatic emergency medical services-treated OHCA from the Cardiac Arrest Registry to Enhance Survival database for 2016 to 2020 were used to estimate YLL. Cerebral performance category score disability weights were used to estimate YLD. The calculated DALY for the study population was extrapolated to a national level to estimate total US DALY. Data were reported as DALY total and rate. Data for 2020 (pandemic) were compared prepandemic years (2016-2019) via the chi-square test or t-test, as appropriate. **RESULTS:** A total of 440,438 OHCA met study inclusion criteria. Total OHCA DALY in the United States increased from 4,468,155 (YLL = 4,463,988; YLD = 4167) in 2019 to 5,379,660 (YLL = 5,375,464; YLD = 4197) in 2020. The DALY rate

increased from 1357 per 100,000 individuals in 2019 to 1630 per 100,000 individuals in 2020. Bystander cardiopulmonary resuscitation (CPR) rates did not significantly change (47.96% in 2016-2019 vs. 47.89% in 2020; $p = 0.157$). CONCLUSION: The overall burden of disease because of adult OHCA increased significantly during the COVID-19 pandemic. We observed no change in the willingness of layperson bystanders to perform CPR on a national level in the United States.

3. Resusc Plus. 2022 Dec;12:100299. doi: 10.1016/j.resplu.2022.100299. Epub 2022 Sep 6.

Impact of the COVID-19 pandemic on out-of-hospital cardiac arrest outcomes in older adults in Japan.

Hosomi S(1)(2), Zha L(2), Kiyohara K(3), Kitamura T(2), Komukai S(4), Sobue T(2), Oda J(1).

ABSTRACT

AIM: The coronavirus disease (COVID-19) pandemic has negatively affected access to healthcare and treatment. This study aimed to explore the impact of the COVID-19 pandemic on older adults with out-of-hospital cardiac arrest (OHCA) in Japan, a country with a super-aging society. METHODS: This secondary analysis of the All-Japan Utstein Registry included patients aged 65 years and older with bystander-witnessed OHCA between January 1, 2005, and December 31, 2020. Survival outcomes were compared by time period using multivariable logistic regression analyses. The primary outcome measured was the one-month survival rate with neurologically favorable outcomes. RESULTS: Before the COVID-19 pandemic, survival outcomes were steadily improving, and 32,024 patients in 2019 and 31,894 in 2020 were eligible for analysis. The proportions of conventional cardiopulmonary resuscitation and shock by public-access automated external defibrillators were lower in 2020 than in 2019 (6.7% versus 5.7%, $p < 0.001$ and 2.5% versus 2.1%, $p < 0.001$, respectively). Compared to 2019, the one-month survival after OHCA and prehospital return of spontaneous circulation decreased significantly in 2020 than in 2019 (7.7% versus 6.6%, adjusted odds ratio [AOR]: 0.88, 95% confidence interval [CI]: 0.83-0.94, and 16.8% versus 14.9%, AOR: 0.87, 95% CI: 0.83-0.91, respectively). The proportion of neurologically favorable outcomes also decreased, but the decrease was not statistically significant (3.4% versus 2.8%, AOR: 0.92, 95% CI: 0.83-1.01). CONCLUSION: In this population-focused, bystander-witnessed study regarding OHCA, the analysis of nationwide registry data revealed that the COVID-19 pandemic was associated with reduced survival among older adults with OHCA in Japan.

4. Intern Emerg Med. 2022 Sep;17(6):1759-1768. doi: 10.1007/s11739-022-02954-6. Epub 2022 Mar 29.

High-dose intravenous vitamin C decreases rates of mechanical ventilation and cardiac arrest in severe COVID-19.

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ABSTRACT

Intravenous vitamin C (IV-VitC) has been suggested as a treatment for severe sepsis and acute respiratory distress syndrome; however, there are limited studies evaluating its use in severe COVID-19. Efficacy and safety of high-dose IV-VitC (HDIVC) in patients with severe COVID-19 were evaluated. This observational cohort was conducted at a single-center, 530 bed, community teaching hospital and took place from March 2020 through July 2020. Inverse probability treatment weighting (IPTW) was utilized to compare outcomes in patients with severe COVID-19 treated with and without HDIVC. Patients were enrolled if they were older than 18 years of age and were hospitalized secondary to severe COVID-19 infection, indicated by an oxygenation index < 300 . Primary study outcomes included mortality, mechanical ventilation, intensive care unit (ICU) admission, and cardiac arrest. From a total of 100 patients enrolled, 25 patients were in the HDIVC

group and 75 patients in the control group. The average time to death was significantly longer for HDIVC patients ($P = 0.0139$), with an average of 22.9 days versus 13.7 days for control patients. Patients who received HDIVC also had significantly lower rates of mechanical ventilation (52.93% vs. 73.14%; ORIPTW = 0.27; $P = 0.0499$) and cardiac arrest (2.46% vs. 9.06%; ORIPTW = 0.23; $P = 0.0439$). HDIVC may be an effective treatment in decreasing the rates of mechanical ventilation and cardiac arrest in hospitalized patients with severe COVID-19. A longer hospital stay and prolonged time to death may suggest that HDIVC may protect against clinical deterioration in severe COVID-19.

CPR/MECHANICAL CHEST COMPRESSION

1. Chest. 2022 Sep;162(3):569-577. doi: 10.1016/j.chest.2022.03.015. Epub 2022 Mar 17.

Resuscitation Quality in the ICU: A Retrospective Analysis.

Roessler LL(1), Holmberg MJ(2), Pawar RD(3), Lassen AT(4), Moskowitz A(5); American Heart Association's Get With the Guidelines-Resuscitation Investigators.

ABSTRACT

BACKGROUND: American Heart Association quality metrics of resuscitation include time to epinephrine ≤ 5 min, time to defibrillation ≤ 2 min, and confirmation of airway device placement in trachea. This study examined trends in adherence to these quality metrics in the ICU and identified predictors of failure to adhere to these metrics. **RESEARCH QUESTION:** What is the registered adherence to time to epinephrine ≤ 5 min, time to defibrillation ≤ 2 min, and confirmation of airway device placement in trachea in the ICU setting? **STUDY DESIGN AND METHODS:** This was a retrospective analysis. Using the Get With The Guidelines-Resuscitation registry, adult patients with an index cardiac arrest in adult ICUs between 2006 and 2018 in the United States were identified. Modified Poisson regression with generalized estimation equations were used for the analyses. **RESULTS:** A total of 97,009 adult ICU patients from 538 hospitals were identified using the Get With The Guidelines-Resuscitation registry, and 75,668 patients were included in the final analysis. From 2006 to 2018, adherence to time to epinephrine ≤ 5 min increased from 93% (95% CI, 93-94) to 98% (95% CI, 97-98), time to defibrillation ≤ 2 min increased from 72% (95% CI, 69-75) to 75% (95% CI, 72-78), and confirmation of airway device placement in trachea increased from 93% (95% CI, 91-94) to 97% (95% CI, 96-98). Nonwitnessed status ($P < .001$), nonmonitored status ($P = .003$), and nighttime arrest ($P = .002$) were associated with adherence failure for time to epinephrine ≤ 5 min, whereas a noncardiac ($P < .001$) or traumatic ($P < .001$) illness category, renal insufficiency ($P = .001$), and nighttime arrest ($P = .03$) were associated with adherence failure for time to defibrillation ≤ 2 min. **INTERPRETATION:** Overall, quality metric adherence was high in the ICU, with the exception of time to defibrillation ≤ 2 min.

REGISTRIES, REVIEWS AND EDITORIALS

1. PLoS One. 2022 Sep 14;17(9):e0274130. doi: 10.1371/journal.pone.0274130. eCollection 2022.

Heart rate and diastolic arterial pressure in cardiac arrest patients: A nationwide, multicenter prospective registry.

Han C(1), Lee JH(2); Korean Hypothermia Network Investigators.

ABSTRACT

BACKGROUND: Guidelines have recommended monitoring mean arterial pressure (MAP) and systolic arterial pressure (SAP) in cardiac arrest patients, but there has been relatively little regard for diastolic arterial pressure (DAP) and heart rate (HR). We aimed to determine the prognostic significance of hemodynamic parameters at all time points during targeted temperature

management (TTM). **METHODS:** We reviewed the SAP, DAP, MAP, and HR data in out-of-hospital cardiac arrest (OHCA) survivors from the prospective multicenter registry of 22 teaching hospitals. This study included 1371 patients who underwent TTM among 10,258 cardiac arrest patients. The hemodynamic parameters were recorded every 6 hours from the return of spontaneous circulation (ROSC) to 4 days. The risks of those according to time points during TTM were compared. **RESULTS:** Of the included patients, 943 (68.8%) had poor neurological outcomes. The predictive ability of DAP surpassed that of SAP and MAP at all time points, and among the hemodynamic variables HR/DAP was the best predictor of the poor outcome. The risks in patients with DAP < 55 to 70 mmHg and HR > 70 to 100 beats/min were steeply increased for 2 days after ROSC and correlated with the poor outcome at all time points. Bradycardia showed lower risks only at 6 hours to 24 hours after ROSC. **CONCLUSION:** Hemodynamic parameters should be intensively monitored especially for 2 days after ROSC because cardiac arrest patients may be vulnerable to hemodynamic instability during TTM. Monitoring HR/DAP can help assess the risks in cardiac arrest patients.

IN-HOSPITAL CARDIAC ARREST

No articles identified.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. Intern Med J. 2022 Sep;52(9):1602-1608. doi: 10.1111/imj.15352. Epub 2022 May 31.

Association between frailty and clinical outcomes in hospitalised patients requiring Code Blue activation.

Brown H(1), Donnan M(1), McCafferty J(1), Collyer T(2), Tiruvoipati R(1)(3), Gupta S(1)(3).

ABSTRACT

BACKGROUND: Code Blues allow a rapid, hospital wide response to acutely deteriorating patients. The concept of frailty is being increasingly recognised as an important element in determining outcomes of critically ill patients. We hypothesised that increasing frailty would be associated with worse outcomes following a Code Blue. **AIMS:** To investigate the association between increasing frailty and outcomes of Code Blues. **METHODS:** Single-centre retrospective design of patients admitted to Frankston Hospital in Australia between 1 January 2013 and 31 December 2017 who triggered a Code Blue. Frailty evaluation was made based on electronic medical records as were the details and the outcomes of the Code Blue. The primary outcome measure was a composite of hospital mortality or Cerebral Performance Categories scale ≥ 3 . Secondary outcomes included the immediate outcome of the Code Blue and hospital mortality. **RESULTS:** One hundred and forty-eight of 911 screened patients were included in the final analysis. Seventy-three were deemed 'frail' and the remainder deemed 'fit'. Seventy-eight percent of frail patients reached the primary outcome, compared with 41% of fit patients ($P < 0.001$). Multivariable analysis demonstrated frailty to be associated with primary outcome (odds ratio = 2.87; 95% confidence interval (CI) 1.28-6.44; $P = 0.01$). A cardiac aetiology for the Code Blue was also associated with an increased odds of primary outcome (OR = 3.52; 95% CI 1.51-8.05; $P = 0.004$). **CONCLUSIONS:** Frailty is independently associated with the composite outcome of hospital mortality or severe disability following a Code

Blue. Frailty is an important tool in prognostication for these patients and might aid in discussions regarding treatment limitations.

2. Anaesthesia. 2022 Sep 16. doi: 10.1111/anae.15856. Online ahead of print.

Methods of the 7(th) National Audit Project (NAP7) of the Royal College of Anaesthetists: peri-operative cardiac arrest.

Kane AD, Armstrong RA, Kursumovic E, Cook TM, Oglesby FC, Cortes L, Moppett IK, Moonesinghe SR, Agarwal S, Bouch DC, Cordingley J, Davies MT, Dorey J, Finney SJ, Kunst G, Lucas DN, Nickols G, Mouton R, Nolan JP, Patel B, Pappachan VJ, Plaat F, Samuel K, Scholefield BR, Smith JH, Varney L, Vindrola-Padros C, Martin S, Wain EC, Kendall SW, Ward S, Drake S, Lourtie J, Taylor C, Soar J.

ABSTRACT

Cardiac arrest in the peri-operative period is rare but associated with significant morbidity and mortality. Current reporting systems do not capture many such events, so there is an incomplete understanding of incidence and outcomes. As peri-operative cardiac arrest is rare, many hospitals may only see a small number of cases over long periods, and anaesthetists may not be involved in such cases for years. Therefore, a large-scale prospective cohort is needed to gain a deep understanding of events leading up to cardiac arrest, management of the arrest itself and patient outcomes. Consequently, the Royal College of Anaesthetists chose peri-operative cardiac arrest as the 7th National Audit Project topic. The study was open to all UK hospitals offering anaesthetic services and had a three-part design. First, baseline surveys of all anaesthetic departments and anaesthetists in the UK, examining respondents' prior peri-operative cardiac arrest experience, resuscitation training and local departmental preparedness. Second, an activity survey to record anonymised details of all anaesthetic activity in each site over 4 days, enabling national estimates of annual anaesthetic activity, complexity and complication rates. Third, a case registry of all instances of peri-operative cardiac arrest in the UK, reported confidentially and anonymously, over 1 year starting 16 June 2021, followed by expert review using a structured process to minimise bias. The definition of peri-operative cardiac arrest was the delivery of five or more chest compressions and/or defibrillation in a patient having a procedure under the care of an anaesthetist. The peri-operative period began with the World Health Organization 'sign-in' checklist or first hands-on contact with the patient and ended either 24 h after the patient handover (e.g. to the recovery room or intensive care unit) or at discharge if this occurred earlier than 24 h. These components described the epidemiology of peri-operative cardiac arrest in the UK and provide a basis for developing guidelines and interventional studies.

3. PLoS One. 2022 Sep 14;17(9):e0273567. doi: 10.1371/journal.pone.0273567. eCollection 2022.

Symptoms and ECG changes precede sudden cardiac death in hypertrophic cardiomyopathy-A nationwide study among the young in Sweden.

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ABSTRACT

BACKGROUND: Hypertrophic cardiomyopathy (HCM) is a major cause of sudden cardiac death (SCD) in the young. We aimed to characterize detailed family history, symptoms, hospital utilization and ECG changes before SCD. **METHODS:** We extracted all cases suffering SCD with HCM from the SUDDY cohort, which includes all cases of SCD between 2000-2010 in Sweden among individuals aged 0-35 years along with their controls. We gathered data from mandatory national registries, autopsy reports, medical records, ECGs (including military conscripts), and detailed family history from an interview-based questionnaire (with relatives, post-mortem). **RESULTS:** Thirty-eight cases (7 female), mean age 22 years, with HCM were identified. Among these, 71% presented with possible cardiac symptoms (chest pain [26%], syncope [22%], palpitations [37%]), before death; 69% received

medical care (vs 21% in controls) within 180 days before death. The majority (68%) died during recreational activity (n = 14) or exercise/competitive sports (n = 12). Fifteen (39%) had a known cardiac disorder prior to death, with HCM being diagnosed pre-mortem in nine cases. 58% presented with abnormal ECG recordings pre-mortem, and 50% had a positive family history (1st-3rd generation) for heart disease. CONCLUSION: In this comprehensive, nationwide study of SCD due to HCM, 87% (33/38) of cases had one or more abnormality prior to death, including cardiac symptoms, a positive family history, known cardiac disease or ECG abnormalities. They sought medical care prior death, to a larger extent than controls. These findings suggest that cardiac screening should be expanded beyond competitive athletes to aid SCD prevention in the young population with HCM.

4. Med Clin (Barc). 2022 Sep 8:S0025-7753(22)00429-8. doi: 10.1016/j.medcli.2022.08.006. Online ahead of print.

Clinical characteristics of patients with cardiac arrest induced by pesticide

poisoning: Analysis of 15 cases. [Article in English, Spanish]

Jiang M(1), Han L(1), He F(2).

ABSTRACT

INTRODUCTION AND OBJECTIVE: Pesticide poisoning induced cardiac arrest (PPICA) has rarely been reported before, and can easily be overlooked by physicians. The aim of the study was to investigate the clinical characteristics of PPICA patients. METHODS: This was a single-center, retrospective analysis in the emergency intensive care unit (EICU) at tertiary medical facility, from January 2015 to December 2018. RESULTS: A total of 15 patients with PPICA in EICU were included, of which nine were females, where suicide was the only cause of poisoning. Thirteen were in-hospital cases and only three cases showed an initial shockable rhythm. On admission, patients' median acute physiology and chronic health evaluation II score was 20 (12, 21) and median sequential organ failure assessment score was 7 (4, 10). All cases required invasive mechanical ventilation and vasopressors therapy. Seven patients received blood purification therapy. The primary toxic agent was organophosphorus pesticide (OP) and all OP cases (8/15) received pralidoxime and atropine therapy. Thirteen patients received gastric decontamination. The primary complications were cardiogenic shock (10/15) and acute kidney injury (3/15). Seven patients survived at discharge. Of these, three made a full recovery without neurological sequelae. CONCLUSIONS: Cardiac arrest has rarely been reported in pesticide poisoning before, and can easily be overlooked. Physicians therefore should pay attention to specific therapy and best supportive treatment, which could be critical to improve the disease outcomes.

END-TIDAL CO₂

1. Am J Emerg Med. 2022 Sep 6;61:120-126. doi: 10.1016/j.ajem.2022.08.058. Online ahead of print.

The difference between arterial pCO(2) and etCO(2) after cardiac arrest - Outcome predictor or marker of unfavorable resuscitation circumstances?

Mueller M(1), Jankow E(1), Grafeneder J(2), Schoergenhofer C(3), Poppe M(1), Schriefl C(1), Clodi C(1), Koch M(1), Ettl F(1), Holzer M(1), Losert H(1).

ABSTRACT

INTRODUCTION: In former studies, the arterio-alveolar carbon dioxide gradient (ΔCO_2) predicted in-hospital mortality after initially survived cardiac arrest. As early outcome predictors are urgently needed, we evaluated ΔCO_2 as predictor for good neurological outcome in our cohort. METHODS: We retrospectively analyzed all patients ≥ 18 years of age after non-traumatic in- and out of hospital cardiac arrest in the year 2018 from our resuscitation database. Patients without advanced airway management, incomplete datasets or without return of spontaneous circulation were excluded. The

first arterial pCO₂ after admission and the etCO₂ in mmHg at the time of blood sampling were recorded from patient's charts. We then calculated Δ CO₂ (pCO₂ - etCO₂). For baseline analyses, Δ CO₂ was dichotomized into a low and high group with separation at the median. Good neurological outcome on day 30, expressed as Cerebral Performance Category 1-2, defined our primary endpoint. Survival to 30 days was used as secondary endpoint. RESULTS: Out of 302 screened patients, 128 remained eligible for analyses. Δ CO₂ was lower in 30-day survivors with good neurological outcome (12.2 mmHg vs. 18.8 mmHg, p = 0.009) and in 30-day survivors (12.5 mmHg vs. 20.0 mmHg, p = 0.001). In patients with high Δ CO₂, a cardiac etiology of arrest was found less often. They had a higher body mass index, longer duration of resuscitation, higher amounts of epinephrine, lower pO₂ levels but both higher pCO₂ and blood lactate levels, resulting in lower blood pH and HCO₃⁻ levels at admission. In a crude binary logistic regression analysis, Δ CO₂ was associated with 30-day neurological outcome (OR = 1.041 per mmHg of Δ CO₂, 95% CI 1.008-1.074, p = 0.014). This association persisted after the adjustment for age, sex, witnessed arrest and shockable first rhythm. However, after addition of the duration of resuscitation or the cumulative epinephrine dosage to the model, Δ CO₂ lost its association. CONCLUSION: Δ CO₂ at admission after a successfully resuscitated cardiac arrest is associated with 30 days survival with good neurological outcome. However, a higher Δ CO₂ may rather be a surrogate for unfavorable resuscitation circumstances than an independent outcome predictor.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

1. Am J Cardiovasc Drugs. 2022 Sep;22(5):523-533. doi: 10.1007/s40256-022-00522-z. Epub 2022 Mar 22.

The Effect of Vasopressin and Methylprednisolone on Return of Spontaneous Circulation in Patients with In-Hospital Cardiac Arrest: A Systematic Review and Meta-analysis of Randomized Controlled Trials.

Abdelazeem B(1)(2)(3), Awad AK(4), Manasrah N(5)(6), Elbadawy MA(4), Ahmad S(7), Savarapu P(8), Abbas KS(9), Kunadi A(10).

ABSTRACT

INTRODUCTION: Cardiac arrest is often fatal if not treated immediately by cardiopulmonary resuscitation to restore a normal heart rhythm and spontaneous circulation. We aim to evaluate the clinical benefits of vasopressin and methylprednisolone versus placebo for patients with in-hospital cardiac arrest. **DATA SOURCES:** We searched PubMed, EMBASE, Scopus, Web of Science, Cochrane Central, and Google Scholar from inception to October 17, 2021, by using search terms included "Vasopressin" AND "Methylprednisolone" AND "Cardiac arrest". **STUDY SELECTION AND DATA EXTRACTION:** We included randomized controlled trials (RCTs) that compared vasopressin and methylprednisolone to placebo. The main outcomes were the return of spontaneous circulation (ROSC) and survival to hospital discharge. **DATA SYNTHESIS:** A total of three RCTs, with a total of 869 patients, were included. The pooled risk ratios (RRs) were calculated along with their 95%

confidence intervals (CIs). Our result showed an increase in ROSC in patients who received vasopressin and methylprednisolone (RR = 1.32; 95% CI = [1.18, 1.47], $p < 0.00001$) when compared with the placebo group. However, there was no difference between both groups regarding survival to hospital discharge (RR = 1.76; 95% CI = [0.68, 4.56], $p = 0.25$). **RELEVANCE TO PATIENT CARE AND CLINICAL PRACTICE:** The current guidelines recommend epinephrine for patients with in-hospital cardiac arrest. Our meta-analysis updates clinicians about using vasopressin and methylprednisolone besides epinephrine, providing them with the best available evidence in managing patients with in-hospital cardiac arrest. **CONCLUSION:** Among patients with in-hospital cardiac arrest, administration of vasopressin and methylprednisolone besides epinephrine is associated with increased ROSC compared with placebo and epinephrine. However, high-quality RCTs are necessary before drawing a firm conclusion regarding the efficacy of vasopressin and methylprednisolone for patients with in-hospital cardiac arrest.

TRAUMA

1. Int J Emerg Med. 2022 Sep 16;15(1):52. doi: 10.1186/s12245-022-00454-0.

Comparison of in-hospital and out-of-hospital cardiac arrest of trauma patients in Qatar.

Irfan FB(1), Consunji RIGDJ(2), Peralta R(2)(3), El-Menyar A(2)(4), Dsouza LB(5), Al-Suwaidi JM(6), Singh R(6), Castrén M(7), Djärv T(8), Alinier G(9)(10)(11)(12).

ABSTRACT

BACKGROUND: Cardiac arrests in admitted hospital patients with trauma have not been described in the literature. We defined "in-hospital cardiac arrest of a trauma" (IHCAT) patient as "cessation of circulatory activity in a trauma patient confirmed by the absence of signs of circulation or abnormal cardiac arrest rhythm inside a hospital setting, which was not cardiac re-arrest." This study aimed to compare epidemiology, clinical presentation, and outcomes between in- and out-of-hospital arrest resuscitations in trauma patients in Qatar. It was conducted as a retrospective cohort study including IHCAT and out-of-hospital trauma cardiac arrest (OHTCA) patients from January 2010 to December 2015 utilizing data from the national trauma registry, the out-of-hospital cardiac arrest registry, and the national ambulance service database. **RESULTS:** There were 716 traumatic cardiac arrest patients in Qatar from 2010 to 2015. A total of 410 OHTCA and 199 IHCAT patients were included for analysis. The mean annual crude incidence of IHCAT was 2.0 per 100,000 population compared to 4.0 per 100,000 population for OHTCA. The univariate comparative analysis between IHCAT and OHTCA patients showed a significant difference between ethnicities ($p=0.04$). With the exception of head injury, IHCAT had a significantly higher proportion of localization of injuries to anatomical regions compared to OHTCA; spinal injury (OR 3.5, 95% CI 1.5-8.3, $p<0.004$); chest injury (OR 2.62, 95% CI 1.62-4.19, $p<0.00$), and abdominal injury (OR 2.0, 95% CI 1.0-3.8, $p<0.037$). IHCAT patients had significantly higher hypovolemia (OR 1.66, 95% CI 1.18-2.35, $p=0.004$), higher mean Glasgow Coma Scale (GCS) score (OR 1.4, 95% CI 1.3-1.6, $p<0.00$), and a greater proportion of initial shockable rhythm (OR 3.51, 95% CI 1.6-7.7, $p=0.002$) and cardiac re-arrest (OR 6.0, 95% CI 3.3-10.8, $p<0.00$) compared to OHTCA patients. Survival to hospital discharge was greater for IHCAT patients compared to OHTCA patients (OR 6.3, 95% CI 1.3-31.2, $p=0.005$). Multivariable analysis for comparison after adjustment for age and gender showed that IHCAT was associated with higher odds of spinal injury, abdominal injury, higher pre-hospital GCS, higher occurrence of cardiac re-arrest, and better survival than for OHTCA patients. IHCAT patients had a greater proportion of anatomically localized injuries indicating solitary injuries compared to greater polytrauma in OHTCA. In contrast, OHTCA patients had a higher proportion of diffuse blunt non-localizable polytrauma injuries that were severe enough to cause immediate or earlier onset of cardiac arrest.

CONCLUSION: In traumatic cardiac arrest patients, IHCAT was less common than OHTCA and might be related to a greater proportion of solitary localized anatomical blunt injuries (head/abdomen/chest/spine). In contrast, OHTCA patients were associated with diffuse blunt non-localizable polytrauma injuries with increased severity leading to immediate cardiac arrest. IHCAT was associated with a higher mean GCS score and a higher rate of initial shockable rhythm and cardiac re-arrest, and improved survival rates.

VENTILATION

1. Resusc Plus. 2022 Sep 5;11:100297. doi: 10.1016/j.resplu.2022.100297. eCollection 2022 Sep.

Videolaryngoscopy versus direct laryngoscopy for endotracheal intubation of cardiac arrest patients in hospital: A systematic literature review.

Cox L(1), Tebbett A(1).

ABSTRACT

AIMS: Airway management during cardiopulmonary resuscitation may involve endotracheal intubation complicated by associated difficulties. Videolaryngoscopy may help to ease these difficulties and increase success rates by removing the need to achieve a direct line of sight required by standard direct laryngoscopy. This literature review aims to establish if there is an overall benefit in using videolaryngoscopy over direct laryngoscopy when intubating patients during cardiac arrest in the non-theatre hospital environment. **METHODS:** The review was registered on PROSPERO (record ID 329987). A systematic search was conducted of EMBASE, MEDLINE, CINAHL and Web of Science for literature comparing the use of videolaryngoscopy to direct laryngoscopy during intubation of cardiac arrest patients in hospital up until 4th May 2022. The Cochrane Central Register of Controlled Trials (CENTRAL) database was accessed, and reference lists of relevant systematic reviews were analysed for further papers. Forward and backward citation tracking was carried out of the shortlisted papers to hand-search for any further relevant studies. Papers were included in the review if they used adult patients, the patients were intubated during cardiac arrest in hospital and if the papers were in English language or had an accessible translation. Papers were excluded if patients were intubated not during cardiac arrest, the studies were based outside of a hospital setting or in the operating theatre, the patients were paediatric or if the study used a simulation or manikin. The Critical Appraisal Skills Programme checklists were used to assess risk of bias. Odds ratios, confidence intervals and probability values were used to synthesise results. **RESULTS:** Six studies were identified that collectively analysed 4525 patients who were intubated during cardiac arrest in the non-theatre hospital environment; five studies were observational and one a randomised controlled trial. Most of the studies being observational in nature led to a significant bias in their methodology which is a limitation to this review. The studies all measured first pass success rate as the primary outcome. First pass success rate only improved with videolaryngoscopy compared to direct laryngoscopy when the intubator was a less experienced clinician. Videolaryngoscopy also reduced some endotracheal intubation related complications and improved glottic visualisation when compared to direct laryngoscopy. **CONCLUSION:** The limited data suggests that use of videolaryngoscopy improved first pass success rates compared to direct laryngoscopy when the clinician was less experienced.

2. Intensive Care Med. 2022 Sep 16. doi: 10.1007/s00134-022-06821-y. Online ahead of print.

Cardiac arrest and complications during non-invasive ventilation: a systematic review and meta-analysis with meta-regression.

Rolle A(#)(1)(2), De Jong A(#)(1)(3), Vidal E(1)(2), Molinari N(4), Azoulay E(5), Jaber S(6)(7).

ABSTRACT

PURPOSE: The aim of this study was to perform a systematic review and meta-analysis to investigate the incidence rate of cardiac arrest and severe complications occurring under non-invasive

ventilation (NIV). **METHODS:** We performed a systematic review and meta-analysis of studies between 1981 and 2020 that enrolled adults in whom NIV was used to treat acute respiratory failure (ARF). We generated the pooled incidence and confidence interval (95% CI) of NIV-related cardiac arrest per patient (primary outcome) and performed a meta-regression to assess the association with study characteristics. We also generated the pooled incidences of NIV failure and hospital mortality. **RESULTS:** Three hundred and eight studies included a total of 7,601,148 participants with 36,326 patients under NIV (8187 in 138 randomized controlled trials, 9783 in 99 prospective observational studies, and 18,356 in 71 retrospective studies). Only 19 (6%) of the analyzed studies reported the rate of NIV-related cardiac arrest. Forty-nine cardiac arrests were reported. The pooled incidence was 0.01% (95% CI 0.00-0.02, I² = 0% (0-15)). NIV failure was reported in 4371 patients, with a pooled incidence of 11.1% (95% CI 9.0-13.3). After meta-regression, NIV failure and the study period (before 2010) were significantly associated with NIV-related cardiac arrest. The hospital mortality pooled incidence was 6.0% (95% CI 4.4-7.9). **CONCLUSION:** Cardiac arrest related to NIV occurred in one per 10,000 patients under NIV for ARF treatment. NIV-related cardiac arrest was associated with NIV failure.

CEREBRAL MONITORING

No articles identified.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. Resuscitation. 2022 Sep 12:S0300-9572(22)00661-X. doi: 10.1016/j.resuscitation.2022.09.005. Online ahead of print.

Heterogeneity of Teaching Approaches to Determine Hand Position for Adult Chest Compressions among European Basic Life Support Instructors.

Fijačko N(1), Masterson Creber R(2), Van Goor S(3), Strnad M(4), Greif R(5).

NO ABSTRACT AVAILABLE

2. Resuscitation. 2022 Sep 13:S0300-9572(22)00660-8. doi: 10.1016/j.resuscitation.2022.09.004. Online ahead of print.

" Are Out-of-hospital Cardiac Arrest Outcomes Really Unpredictable?".

Ramirez CM(1), Prescott RJ(2), Varon J(3).

NO ABSTRACT AVAILABLE

3. Eur J Pediatr. 2022 Sep 17. doi: 10.1007/s00431-022-04625-2. Online ahead of print.

A novel retraining strategy of chest compression skills for infant CPR results in high skill retention for longer.

Gugelmin-Almeida D(1)(2), Jones M(3), Clark C(4), Rolfe U(4), Williams J(4).

ABSTRACT

Infant cardiopulmonary resuscitation (iCPR) is often poorly performed, predominantly because of ineffective learning, poor retention and decay of skills over time. The aim of this study was to investigate whether an individualized, competence-based approach to simulated iCPR retraining could result in high skill retention of infant chest compressions (iCC) at follow-up. An observational study with 118 healthcare students was conducted over 12 months from November 2019.

Participants completed pediatric resuscitation training and a 2-min assessment on an infant mannequin. Participants returned for monthly assessment until iCC competence was achieved. Competence was determined by passing assessments in two consecutive months. After achieving competence, participants returned just at follow-up. For each 'FAIL' during assessment, up to six minutes of practice using real-time feedback was completed and the participant returned the following month. This continued until two consecutive monthly 'PASSES' were achieved, following which, the participant was deemed competent and returned just at follow-up. Primary outcome was retention of competence at follow-up. Descriptive statistics were used to analyze demographic data. Independent t-test or Mann-Whitney U test were used to analyze the baseline characteristics of those who dropped out compared to those remaining in the study. Differences between groups retaining competence at follow-up were determined using the Fisher exact test. On completion of training, 32 of 118 participants passed the assessment. Of those achieving iCC competence at month 1, 96% retained competence at 9-10 months; of those achieving competence at month 2, 86% demonstrated competence at 8-9 months; of those participants achieving competence at month 3, 67% retained competence at 7-8 months; for those achieving competence at month 4, 80% demonstrated retention at 6-7 months. Conclusion: Becoming iCC competent after initial training results in high levels of skill retention at follow-up, regardless of how long it takes to achieve competence. What is Known: • Infant cardiopulmonary resuscitation (iCPR) is often poorly performed and skills decay within months after training. • Regular iCPR skills updates are important, but the optimal retraining interval considering individual training needs has yet to be established. What is New: • Infant chest compression (iCC) competence can be achieved within one to four months after training and once achieved, it can be retained for many months. • With skill reinforcement of up to 28 minutes after initial training, 90% of individuals were able to achieve competence in iCC and 86% retained this competence at follow-up.

POST-CARDIAC ARREST TREATMENTS

1. Eur Heart J Acute Cardiovasc Care. 2022 Sep 15:zuac109. doi: 10.1093/ehjacc/zuac109. Online ahead of print.

Blood pressure and oxygenation targets after out-of-hospital cardiac arrest-trial (BOX).

van Diepen S(1), Tavazzi G(2)(3), Morrow DA(4).

NO ABSTRACT AVAILABLE

2. Catheter Cardiovasc Interv. 2022 Sep;100(3):306-316. doi: 10.1002/ccd.30316. Epub 2022 Jun 29.

Variation in practice for out-of-hospital cardiac arrest treated with percutaneous coronary intervention in England and Wales.

Rashid M(1)(2), Kinnaird T(3), Ludman P(4), Keeble TR(5)(6), Mamas M(1)(2), Curzen N(7)(8).

ABSTRACT

OBJECTIVES: We assessed the association between total center volume, operator volume, and out-of-hospital cardiac arrest (OHCA) percutaneous coronary intervention (PCI) volume. **BACKGROUND:** Variations between OHCA PCI volume, hospital total PCI, and primary PCI volume are not well studied and are unlikely to be clinically justifiable. **METHODS:** Patients undergoing PCI for the acute coronary syndrome (ACS) between January 1, 2014, and March 31, 2019, in England and Wales were grouped as OHCA PCI and non-OHCA PCI. Spearman's correlation was used to determine the degree of correlation between each hospital PCI volume and OHCA PCI volume. **RESULTS:** Out of 250,088 PCI procedures undertaken for ACS, 12,016 (4.8%) were performed for OHCA, and 238,072 (95.2%) were non-OHCA PCI procedures. The OHCA PCI group were younger [mean age (SD) 63.2 (12.3) and 65.6 (12.5, $p < 0.001$)], less likely to be female (20.2% vs. 26.9%, $p < 0.001$) or Black, Asian, and Minority Ethnicity (11.5% vs. 14.8%, $p < 0.001$) compared to the non-OHCA PCI group. Although there was a

degree of correlation between total PCI and OHCA PCI, there was wide variation for both ACS cohort (Spearman correlation $R^2 = 0.50$) and total PCI volume (Spearman correlation $R^2 = 0.60$). Furthermore, the correlation between primary PCI volume and OHCA PCI within centers was weak ($R^2 = 0.10$). Similarly, wide variations between operator PCI volume and OHCA PCI volume were observed. CONCLUSION: These national data demonstrate wide variation in the practice of OHCA PCI both between centers and individuals. These variations are not expected according to clinical factors and require further investigation.

TARGETED TEMPERATURE MANAGEMENT

1. Acta Anaesthesiol Scand. 2022 Oct;66(9):1116-1123. doi: 10.1111/aas.14125. Epub 2022 Aug 16.

Targeted temperature management evolving over time-A local process analysis.

Strålin A(1), Thuccani M(1), Lilja L(1), Rylander C(1).

ABSTRACT

BACKGROUND: Post-resuscitation care of comatose survivors from cardiac arrest includes target temperature management (TTM) to mitigate cerebral reperfusion injury. High-quality TTM requires protocols enhancing good precision. This study explored how the quality of TTM may have evolved with increasing experience from clinical trial protocols and standard operating procedures. We hypothesized that there would be a positive effect over time, detectable between trial periods and between trial periods and later everyday practice. **METHODS:** Three TTM quality parameters were defined: time to target, temperature variability, and fever incidence. Data from 181 patients treated during three different time periods in a tertiary center were analyzed; 45 from Period 1 (local trial cohort 2011-2013) targeting 33°C or 36°C; 76 from Period 2 (local trial cohort 2018-2020) targeting 33 or <37.5°C; 60 from Period 3 (current standard operating procedure 2020-2021) targeting 36°C. Groups of similar target temperatures from different time periods were compared using ordinary group statistics. **RESULTS:** TTM quality in all three parameters increased between trial periods. There were no differences in TTM quality as to temperature variability or fever incidence between the <37.5°C Period 2 and the 36°C Period 3 groups. A 33°C target temperature was associated with lower fever incidence than 36°C and <37.5°C target regimes. **CONCLUSION:** The observed increase in TTM quality in this single-center study may be a result of increased competence through learning and training in different strict TTM protocols. If so, the results of this study further support the protocolization of post-cardiac arrest intensive care.

2. Ther Hypothermia Temp Manag. 2022 Sep;12(3):171-176. doi: 10.1089/ther.2021.0028. Epub 2022 Jan 11.

Targeted Temperature Management Experience of an Academic Emergency Department: A 5-Year Retrospective Study.

Ozdamar Y(1), Agackiran İ(2), Metin Aksu N(3).

ABSTRACT

Targeted temperature management (TTM) for postcardiac arrest syndrome patients is a cornerstone therapy to reduce mortality and neurological morbidity. The care of critical patients is provided in the emergency department (ED) when intensive care units (ICUs) are unavailable. This study aimed to determine the characteristics and mortality outcomes of postcardiac arrest patients who underwent TTM in an academic ED. Postcardiac arrest patients who underwent TTM between January 1, 2014, to November 1, 2018, at a tertiary care academic ED in Turkey were examined retrospectively. The mean age of 24 patients in whom TTM was initiated in the ED was 60.7 ± 19.2 years. Five (20.8%) of the patients who underwent TTM were discharged. Four (80%) of the discharged patients were in out-of-hospital cardiac arrest (OHCA). All patients with a total

cardiopulmonary resuscitation duration of >25 minutes died. Mortality was significantly higher in patients without light reflexes ($p = 0.006$). Two patients who underwent TTM in the ED became organ donors after neurological determination of death. If the ICU cannot meet the needs, early initiation of TTM in the ED may contribute to good neurological outcomes. In this study, 80% of the patients who have positive neurological outcomes are OHCA. Lack of light reflex may be an evidence of poor neurological outcomes in postcardiac arrest patients. Emergency physicians should be encouraged to apply TTM.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

1. Resusc Plus. 2022 Sep 6;11:100287. doi: 10.1016/j.resplu.2022.100287. eCollection 2022 Sep. **A survey of the incidence of defibrillator damage during double sequential external defibrillation for refractory ventricular fibrillation.**

Drennan IR(1)(2)(3), Seidler D(4)(5), Cheskes S(3)(6)(7).

ABSTRACT

BACKGROUND: Double Sequential External Defibrillation (DSED) is a proposed treatment strategy for patients in refractory VF (RVF) during out-of-hospital cardiac arrest (OHCA). Defibrillator damage employing DSED is a theoretical concern expressed by defibrillator manufacturers yet the incidence of damage during resuscitation remains unknown. **OBJECTIVE:** We sought to explore the incidence of defibrillator damage employing DSED for RVF during OHCA. **METHODS:** We conducted a survey of EMS agencies, authors of previous publications, EMS medical directors, base hospital medical oversight groups, and defibrillator manufacturers to assess the incidence of defibrillator damage during DSED. Our survey focused on the frequency of DSED use, number of shocks used during DSED, technique used to employ DSED (simultaneous or sequential), and the incidence of defibrillator damage during DSED. We specifically targeted groups that were known to be using DSED in clinical practice. **RESULTS:** Our survey response rate was 50% (65/129): 61% (34/56) EMS medical directors, 60% (6/10) authors, 100% (8/8) base hospitals, 33% (1/3) defibrillator manufacturers, 31% (16/52) paramedic services. In our case-based analysis the overall incidence of defibrillator damage was 0.4%. The incidence of defibrillator damage based on total number of DSED shocks was estimated between 0.11% and 0.22%. All reported cases of defibrillator damage occurred using a simultaneous defibrillation technique. **CONCLUSION:** When DSED is employed using either a sequential or simultaneous technique the rate of defibrillator damage appears to be exceedingly low. Further high-quality evidence is required to determine the impact of DSED on patient centered outcomes, but the incidence of defibrillator damage should not limit its use. Defibrillator damage should continue to be monitored in future trials and clinical practice.

PEDIATRICS AND CHILDREN

1. Acute Crit Care. 2022 Aug;37(3):438-453. doi: 10.4266/acc.2021.01501. Epub 2022 Aug 29.

Cardiopulmonary resuscitation of infants at birth: predictable or unpredictable?

Zarkesh MR(1)(2), Moradi R(3), Orooji A(4).

ABSTRACT

BACKGROUND: Anticipating the need for at-birth cardiopulmonary resuscitation (CPR) in neonates is very important and complex. Timely identification and rapid CPR for neonates in the delivery room significantly reduce mortality and other neurological disabilities. The aim of this study was to create a prediction system for identifying the need for at-birth CPR in neonates based on Machine Learning (ML) algorithms. **METHODS:** In this study, 3,882 neonatal medical records were retrospectively

reviewed. A total of 60 risk factors was extracted, and five ML algorithms of J48, Naive Bayesian, multilayer perceptron, support vector machine (SVM), and random forest were compared to predict the need for at-birth CPR in neonates. Two types of resuscitation were considered: basic and advanced CPR. Using five feature selection algorithms, features were ranked based on importance, and important risk factors were identified using the ML algorithms. RESULTS: To predict the need for at-birth CPR in neonates, SVM using all risk factors reached 88.43% accuracy and F-measure of 88.4%, while J48 using only the four first important features reached 90.89% accuracy and F-measure of 90.9%. The most important risk factors were gestational age, delivery type, presentation, and mother's addiction. CONCLUSIONS: The proposed system can be useful in predicting the need for CPR in neonates in the delivery room.

2. *Semin Perinatol.* 2022 Oct;46(6):151620. doi: 10.1016/j.semperi.2022.151620. Epub 2022 May 21.

Physiology of neonatal resuscitation: Giant strides with small breaths.

Sankaran D(1), Lakshminrusimha S(2), Saugstad OD(3).

ABSTRACT

The transition of a fetus to a newborn involves a sequence of well-orchestrated physiological events. Most neonates go through this transition without assistance but 5-10% may require varying degrees of resuscitative interventions at birth. The most crucial event during this transition is lung inflation with optimal concentrations of oxygen. Rarely, extensive resuscitation including chest compressions and medication may be required. In the past few decades, significant strides have been made in our understanding of the cardiorespiratory transition at birth from a fetus to a newborn and the subsequent resuscitation. This article reviews the physiology behind neonatal transition at birth and various interventions during neonatal resuscitation.

EXTRACORPOREAL LIFE SUPPORT

No articles identified.

EXPERIMENTAL RESEARCH

1. Loss of cardiomyocyte CYB5R3 impairs redox equilibrium and causes sudden cardiac death.

Carew NT(1)(2), Schmidt HM(1)(2), Yuan S(1), Galley JC(1)(2), Hall R(1)(2), Altmann HM(1), Hahn SA(1), Miller MP(1), Wood KC(1)(3), Gabris B(4), Stapleton MC(5), Hartwick S(5), Fazzari M(2), Wu YL(5), Trebak M(1)(2), Kaufman BA(1)(4), McTiernan CF(1)(4), Schopfer FJ(1)(2), Navas P(6), Thibodeau PH(7), McNamara DM(4), Salama G(1)(4), Straub AC(1)(2)(8).

ABSTRACT

Sudden cardiac death (SCD) in patients with heart failure (HF) is allied with an imbalance in reduction and oxidation (redox) signaling in cardiomyocytes; however, the basic pathways and mechanisms governing redox homeostasis in cardiomyocytes are not fully understood. Here, we show that cytochrome b5 reductase 3 (CYB5R3), an enzyme known to regulate redox signaling in erythrocytes and vascular cells, is essential for cardiomyocyte function. Using a conditional cardiomyocyte-specific CYB5R3-knockout mouse, we discovered that deletion of CYB5R3 in male, but not female, adult cardiomyocytes causes cardiac hypertrophy, bradycardia, and SCD. The increase in SCD in CYB5R3-KO mice is associated with calcium mishandling, ventricular fibrillation, and cardiomyocyte hypertrophy. Molecular studies reveal that CYB5R3-KO hearts display decreased adenosine triphosphate (ATP), increased oxidative stress, suppressed coenzyme Q levels, and hemoprotein dysregulation. Finally, from a translational perspective, we reveal that the high-frequency missense

genetic variant rs1800457, which translates into a CYB5R3 T117S partial loss-of-function protein, associates with decreased event-free survival (~20%) in Black persons with HF with reduced ejection fraction (HFrEF). Together, these studies reveal a crucial role for CYB5R3 in cardiomyocyte redox biology and identify a genetic biomarker for persons of African ancestry that may potentially increase the risk of death from HFrEF.

CASE REPORTS

1. J Emerg Nurs. 2022 Sep 12:S0099-1767(22)00205-7. doi: 10.1016/j.jen.2022.08.002. Online ahead of print.

Refractory Anaphylactic Shock Requiring Emergent Venoarterial Extracorporeal Membrane Oxygenation in the Emergency Department: A Case Report.

Joseph J, Bellezzo J.

ABSTRACT

Venoarterial extracorporeal membrane oxygenation is a viable salvage intervention for patients who experience cardiopulmonary arrest or profound shock from any cause. Acute anaphylactic shock is a rare cause of cardiac arrest. We present a case of a 35-year-old male who experienced cardiac arrest owing to anaphylactic shock while receiving general anesthesia for a routine outpatient surgical procedure. Traditional advanced cardiac life support therapies were provided by paramedics en route to the emergency department of a suburban, community-based hospital. Maximal medical management including endotracheal intubation, intravenous steroids, intravenous crystalloid fluid administration, intravenous vasoactive medications, and high-quality cardiopulmonary resuscitation was provided. Although return of spontaneous circulation was achieved, profound cardiogenic shock persisted. Venoarterial extracorporeal membrane oxygenation was initiated by the emergency department provider and nursing team. The patient survived, was neurologically intact, had full recovery, and was discharged home several days later. We have extensive experience with venoarterial extracorporeal membrane oxygenation, and this case exemplifies the value of an established emergency department extracorporeal membrane oxygenation program in managing all causes of cardiac arrest or refractory shock.

2. Cardiol Young. 2022 Sep 14:1-3. doi: 10.1017/S104795112200292X. Online ahead of print.

Occlusion of the os of the left coronary artery by dysplastic aortic valve tissue presenting as progressive mitral insufficiency and cardiac arrest.

Gunsaulus ME(1), Das N(1), Weinberg JG(1), Kreutzer J(1), Castro Medina M(2), DeBrunner M(1).

ABSTRACT

Mitral regurgitation in the neonatal period is relatively rare. It can be secondary to a congenital malformation of the valve apparatus or mitral valve dysfunction and deformation secondary to myocardial dysfunction or volume load of the left ventricle. Less commonly, it can be due to coronary artery abnormalities leading to mitral valve papillary muscle ischaemia and subsequent dysfunction. Such coronary artery abnormalities include anomalous left coronary artery from pulmonary artery, left main coronary artery atresia, or a thromboembolic phenomenon. In this study, we describe a newborn with a dysplastic aortic valve causing obstruction of the os of the left coronary artery leading to progressive mitral insufficiency.

3. Am J Emerg Med. 2022 Sep 6:S0735-6757(22)00559-9. doi: 10.1016/j.ajem.2022.08.056. Online ahead of print.

A successful extracorporeal cardiopulmonary resuscitation for severe status asthmaticus with an ultra-long cardiac arrest.

Zhai H(1), Huang L(2), Li T(3), Hu X(2), Duan D(2), Wu P(2).

ABSTRACT

The mortality of severe asthma with cardiac arrest is still close to 100% even if it is treated with conventional cardiopulmonary resuscitation (CCPR). Extracorporeal cardiopulmonary resuscitation (ECPR) has been widely accepted as an alternative method when CCPR is futile. However, the maximum "low-flow" duration has not been well defined. Here, we reported a 55-year-old male with severe asthma with cardiac arrest, who was successfully treated with ECPR after 100 min of ultra-long CCPR. He was withdrawn from extracorporeal membrane oxygenator and ventilator at 72 h and 14 days after admission respectively and was discharged without permanent neurologic sequelae. This case illustrates the critical role of ECPR as a last resort in near-fatal asthma. For such patients with bystander, starting ECPR after >60 min of CCPR can still obtain satisfactory prognoses.

4. *Ann Palliat Med.* 2022 Sep 9;apm-22-435. doi: 10.21037/apm-22-435. Online ahead of print.

Cesarean section complicated with presumed massive pulmonary embolism and cardiac arrest treated with rescue thrombolytic therapy-two case reports.

Krawczyk P(1), Huras H(2), Jaworowski A(2), Tyszecki P(3), Kołak M(2).

ABSTRACT

BACKGROUND: Massive pulmonary embolus (PE), resulting in cardiac arrest during pregnancy and postpartum, is a rare but potentially catastrophic event. The most severe manifestation of massive PE is cardiovascular instability, including cardiogenic shock and cardiac arrest requiring intensive care unit (ICU) admissions. Up to 23% of high-risk PE pregnant and postpartum patients experience cardiac arrest. **CASE DESCRIPTION:** Case 1, a 34-year-old obese patient, with a twin pregnancy, had cesarean sections in the 24th week of pregnancy due to premature abruption of the placenta. Immediately after the birth, she experienced a sudden cardiac arrest. Treatment was initiated in line with ALS, heparine and alteplase was administered due to suspected massive pulmonary embolism. After 20 minutes from ROSC, the uterine atony and severe hemorrhage occurred, and a postpartum hysterectomy was performed. The mother and two daughters are alive in 2021. Case 2, a 24-year-old obese patient had a cesarean section due to abruption of the placenta in the 28th week of pregnancy. Twelve hours after cesarean delivery, the patient's condition suddenly deteriorated. The patient reported dyspnea, chest pain, and presented cyanosis. The blood pressure was 66/30 mmHg, heart rate 130/min, tachypnea with a respiratory rate of 30/min, saturation 80% on air. High flow oxygen via face mask with reservoir (FiO₂ 0.85) and ephedrine 2×10 mg i.v. were administered. Due to suspected pulmonary embolism, a bolus of 5,000 IU of heparin was administered iv. Despite the implemented measures, cardiac arrest was confirmed with the initial rhythm of PEA (sinus tachycardia 120/min). Treatment consistent with ALS was initiated. Due to the high probability of pulmonary embolism, a bolus of alteplase was administrated. ROSC was obtained 7 minutes later. Because of obstetric hemorrhage hysterectomy was performed. The mother and the baby are alive in 2022. **CONCLUSIONS:** In light of current evidence, presented data suggest that early and aggressive recombinant thrombolytic use in case of cardiac arrest and suspected PE in obstetric patients may be life-saving, effective treatment with a good neurological outcome. Major bleeding complications should be anticipated when administering this therapy.

5. *Cureus.* 2022 Sep 9;14(9):e28966. doi: 10.7759/cureus.28966. eCollection 2022 Sep.

Ventricular Arrhythmias in a Patient With Propionic Acidemia.

Della Rossa AA(1), Dixit PM(1), Shah R(2), Hang S(1), Duong J(1).

ABSTRACT

Propionic acidemia (PA) is a metabolic disorder that involves a defective copy of propionyl-CoA carboxylase (PCC). It has previously been shown that there is an association between QT-

prolongation in propionic acidemia. The patient seen in this case is a male in his early twenties with known PA who was found unconscious on initial presentation due to cardiac arrest with a downtime of twenty minutes. He was subsequently resuscitated and stabilized. The patient underwent placement of an automatic implantable cardioverter-defibrillator (AICD) nineteen days after the initial presentation.