This week's PubMed 13ᵗʰ – 19ᵗʰ February 2022: articles of interest n = 48

<u>**CPR AND COVID-19**</u>

1. Resuscitation. 2022 Feb 14:S0300-9572(22)00047-8. doi: 10.1016/j.resuscitation.2022.02.009. Online ahead of print.
Post resuscitation myocardial dysfunction and echocardiographic characteristics following COVID-19 cardiac arrest.
Bhardwaj A(1), Alwakeel M(2), Duggal A(3), Abi Fadel F(3), Abella BS(4).
NO ABSTRACT AVAILABLE

2. Crit Care Explor. 2022 Feb 8;4(2):e0605. doi: 10.1097/CCE.0000000000000605. eCollection 2022 Feb.
In COVID-19 Patients Who Suffer In-Hospital Cardiac Arrest, Cardiopulmonary Resuscitation Outcomes May Be Impacted by Arrest Etiology and Local Pandemic Conditions.
Murphy CG(1), Nishikawa MS(2), Char ST(2), Nemeth SK(3), Parekh M(1), Bulman WA(1), Wu C(4), Neuberg GW(5), Louh IK(1), Schluger NW(6), Prager KM(1), Fischkoff KN(7), Burkart KM(1).
ABSTRACT
OBJECTIVES: The utility and risks to providers of performing cardiopulmonary resuscitation after in-hospital cardiac arrest in COVID-19 patients have been questioned. Additionally, there are discrepancies in reported COVID-19 in-hospital cardiac arrest survival rates. We describe outcomes after cardiopulmonary resuscitation for in-hospital cardiac arrest in two COVID-19 patient cohorts. DESIGN: Retrospective cohort study. SETTING: New York-Presbyterian Hospital/Columbia University Irving Medical Center in New York, NY. PATIENTS: Those admitted with COVID-19 between March 1, 2020, and May 31, 2020, as well as between March 1, 2021, and May 31, 2021, who received resuscitation after in-hospital cardiac arrest. INTERVENTIONS: None. MEASUREMENT AND MAIN RESULTS: Among 103 patients with coronavirus disease 2019 who were resuscitated after in-hospital cardiac arrest in spring 2020, most self-identified as Hispanic/Latino or African American, 35 (34.0%) had return of spontaneous circulation for at least 20 minutes, and 15 (14.6%) survived to 30 days post-arrest. Compared with nonsurvivors, 30-day survivors experienced in-hospital cardiac arrest later (day 22 vs day 7; p = 0.008) and were more likely to have had an acute respiratory event preceding in-hospital cardiac arrest (93.3% vs 27.3%; p < 0.001). Among 30-day survivors, 11 (73.3%) survived to hospital discharge, at which point 8 (72.7%) had Cerebral Performance Category scores of 1 or 2. Among 26 COVID-19 patients resuscitated after in-hospital cardiac arrest in spring 2021, 15 (57.7%) had return of spontaneous circulation for at least 20 minutes, 3 (11.5%) survived to 30 days post in-hospital cardiac arrest, and 2 (7.7%) survived to hospital discharge, both with Cerebral Performance Category scores of 2 or less. Those who survived to 30 days post in-hospital cardiac arrest were younger (46.3 vs 67.8; p = 0.03), but otherwise there were no significant differences between groups. CONCLUSIONS: Patients with COVID-19 who received cardiopulmonary resuscitation after in-hospital cardiac arrest had low survival rates. Our findings additionally show return of spontaneous circulation rates in these patients may be impacted by hospital strain and that patients with in-hospital cardiac arrest preceded by acute respiratory events might be more likely to survive to 30 days, suggesting Advanced Cardiac Life Support efforts may be more successful in this subpopulation.

3. Resuscitation. 2022 Feb 10;173:4-11. doi: 10.1016/j.resuscitation.2022.02.007. Online ahead of print.
Impact of the COVID-19 pandemic on in-hospital cardiac arrests in the UK.

Edwards JM(1), Nolan JP(2), Soar J(3), Smith GB(4), Reynolds E(5), Carnall J(6), Rowan KM(7), Harrison DA(7), Doidge JC(7).

ABSTRACT

AIMS: To compare in-hospital cardiac arrest (IHCA) rates and patient outcomes during the first COVID-19 wave in the United Kingdom (UK) in 2020 with the same period in previous years. METHODS: A retrospective, multicentre cohort study of 154 UK hospitals that participate in the National Cardiac Arrest Audit and have intensive care units participating in the Case Mix Programme national audit of intensive care. Hospital burden of COVID-19 was defined by the number of patients with confirmed SARS-CoV2 infection admitted to critical care per 10,000 hospital admissions. RESULTS: 16,474 patients with IHCA where a resuscitation team attended were included. Patients admitted to hospital during 2020 were younger, more often male, and of non-white ethnicity compared with 2016-2019. A decreasing trend in IHCA rates between 2016 and 2019 was reversed in 2020. Hospitals with higher burden of COVID-19 had the greatest difference in IHCA rates (21.8 per 10,000 admissions in April 2020 vs 14.9 per 10,000 in April 2019). The proportions of patients achieving ROSC≥20 min and surviving to hospital discharge were lower in 2020 compared with 2016-19 (46.2% vs 51.2%; and 21.9% vs 22.9%, respectively). Among patients with IHCA, higher hospital burden of COVID-19 was associated with reduced survival to hospital discharge (OR=0.95; 95% CI 0.93 to 0.98; p<0.001). CONCLUSIONS: In comparison with 2016-2019, the first COVID-19 wave in 2020 was associated with a higher rate of IHCA and decreased survival among patients attended by resuscitation teams. These changes were greatest in hospitals with the highest COVID-19 burden.

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

Importance of reporting survival as incidence: a cross-sectional comparative study on out-of-hospital cardiac arrest registry data from Germany and Norway.
Tjelmeland IBM(1)(2)(3), Alm-Kruse K(3)(4), Grasner JT(5)(6), Isern CB(2)(3), Jakisch B(7), Kramer-Johansen J(2)(3), Renzing N(5), Wnent J(5)(8), Seewald S(5)(6).

ABSTRACT

OBJECTIVES: Health registries are a unique source of information about current practice and can describe disease burden in a population. We aimed to understand similarities and differences in the German Resuscitation Registry (GRR) and the Norwegian Cardiac Arrest Registry (NorCAR) and compare incidence and survival for patients resuscitated after out-of-hospital cardiac arrest. DESIGN: A cross-sectional comparative analysis reporting incidence and outcome on a population level. SETTING: We included data from the cardiac arrest registries in Germany and Norway. PARTICIPANTS: Patients resuscitated between 1 January 2015 and 31 December 2019 were included, resulting in 29 222 cases from GRR and 16 406 cases from NorCAR. From GRR, only emergency medical services (EMS) reporting survival information for patients admitted to the hospital were included. PRIMARY AND SECONDARY OUTCOME MEASURES: This study focused on the EMS systems, the registries and the patients included in both registries. The results compare the total incidence, incidence of patients resuscitated by EMS, and the incidence of survival. RESULTS: We found an incidence of 68 per 100 000 inhabitants in GRR and 63 in NorCAR. The incidence of patients treated by EMS was 67 in GRR and 53 in NorCAR. The incidence of patients arriving at a hospital was higher

in GRR (24.3) than in NorCAR (15.1), but survival was similar (8 in GRR and 7.8 in NorCAR). CONCLUSION: GRR is a voluntary registry, and in-hospital information is not reported for all cases. NorCAR has mandatory reporting from all EMS and hospitals. EMS in Germany starts treatment on more patients and bring a higher number to hospital, but we found no difference in the incidence of survival. This study has improved our knowledge of both registries and highlighted the importance of reporting survival as incidence when comparing registries.

Decision making and management of acute type-A dissection presenting with shock or cardiac arrest.
Tsukube T(1).
ABSTRACT
While the outcome of aortic repair for acute type-A aortic dissection has improved, overall mortality among patients who developed acute type-A aortic dissection remains extremely high. Hypotension in acute type-A aortic dissection patients is a critical condition that is associated with increased in-hospital mortality and neurologic events. The underlying causes of shock include acute aortic regurgitation, cardiac tamponade, and myocardial infarction. The most reasonable initial approach is to administer intravenous fluids to improve blood pressure, increase preload and cardiac output, and ensure adequate end-organ perfusion. Cardiac tamponade-induced hypotension associated with aortic rupture has been identified as a major risk factor for perioperative mortality in patients with acute type-A aortic dissection. In addition, the most serious complications of acute type-A aortic dissection include preoperative cardiopulmonary arrest, especially out-of-hospital cardiopulmonary arrest. Recent advances in rapid transportation and diagnosis, and the introduction of extracorporeal cardiopulmonary resuscitation, have resulted in an increase in the number of patients with cardiopulmonary arrest related to acute type-A aortic dissection. However, controversy continues to surround treatment strategies, surgical indications, and the timing of surgery on such patients. This review, therefore, discusses decision-making and the managerial issues surrounding acute type-A dissection presenting with shock, cardiac tamponade, and cardiac arrest.

A Comprehensive Approach to Managing Methamphetamine-Associated Cardiomyopathy.
Osekowski M(1), Trytell A(1), La Gerche A(1)(2)(3), Prior D(1)(2), MacIsaac A(1), Paratz ED(4)(5).
ABSTRACT
Methamphetamines are illicit drugs of the amphetamine-type stimulant class that have been increasing in popularity, availability, and purity in recent decades. As a result, rates of methamphetamine-associated cardiomyopathy (MAC) are rising globally. MAC is associated with high rates of sudden cardiac arrest, late presentation, and poor outcomes. This review discusses the medical management of MAC, including anticipated challenges specific to methamphetamine users. Not only are patients with MAC more likely to present at a younger age and with multisystem disease than patients with cardiomyopathy of other etiologies, but there may also be significant behavioral, psychosocial, financial, and system-based challenges to providing the best medical care. An individualized treatment plan that emphasizes methamphetamine abstinence as the foundation of therapy, as well as introducing optimal heart failure therapy and providing multidisciplinary support is likely to result in optimal outcomes. Given the potential reversibility of MAC, institution of guideline-directed heart failure therapy and patient support for adherence to therapy and abstinence from methamphetamines should be energetically pursued.

The evolution of cardiopulmonary resuscitation: Global productivity and publication trends.
Danış F(1), Kudu E(2).
ABSTRACT
BACKGROUND/OBJECTIVE: There is still no comprehensive bibliometric study in the literature on cardiopulmonary resuscitation (CPR), an important topic in emergency medicine, the number of global studies on which is increasing day by day. In this study, it was aimed to analyze the scientific articles on CPR published between 1980 and 2020 by statistical methods and to evaluate the subject holistically. METHODS: Articles on CPR published between 1980 and 2020 were downloaded from the Web of Science (WoS) database and analyzed using statistical methods. Network visualization maps were used to identify trending topics. Nonlinear regression analysis (exponential model) was used to estimate the number of articles in the coming years. Correlation studies were conducted using the Spearman correlation coefficient. RESULTS: A total of 21,623 publications were found. Of these publications, 14,818 (68.5%) were articles. The top 3 contributing countries to the literature were the United States (5281, 35.6%), Germany (1458, 9.8%), and the United Kingdom (1152, 7.7%). The 3 most active institutions were the University of Washington (417), University of Pittsburgh (361), and University of Arizona (240). The 3 journals with the most publications were Resuscitation (2822), Critical Care Medicine (522), and the American Journal of Emergency Medicine (421). CONCLUSION: In this comprehensive study, a summary of 14,818 articles was presented. The trending topics in CPR research in recent years are out-of-hospital cardiac arrest, extracorporeal membrane oxygenation, cardio, simulation, in-hospital cardiac arrest, extracorporeal life support, extracorporeal cardiopulmonary resuscitation, targeted management temperature, and outcome. This article may be a useful resource on CPR global outcomes for clinicians and scientists.

Sex-related disparities in the in-hospital management of patients with out-of-hospital cardiac arrest.
Song J(1), Ahn S(1), Kim J(1), Cho H(1), Moon S(1), Choi SH(2), Park JH(3).
ABSTRACT
AIM: We investigated sex-related differences in the in-hospital management of patients with out-of-hospital cardiac arrest (OHCA). METHODS: We retrospectively analyzed prospectively collected data from the Korean Cardiac Arrest Resuscitation Consortium (KoCARC) registry, a prospective, multicenter OHCA registry. We enrolled adult patients with OHCA between October 2015 and June 2020. The primary outcomes were coronary angiography (CAG), percutaneous coronary intervention (PCI), targeted temperature management (TTM), and extracorporeal membrane oxygenation (ECMO) performed in the hospital. Propensity score matching (PSM) was performed to minimize differences in baseline demographics and characteristics. RESULTS: Among 12,321 patients in the KoCARC registry, we analyzed 8,177 with OHCA. PSM yielded 5,564 matched patients (2,782 women and men, respectively). In the unmatched cohort, women were less likely to undergo CAG, PCI, TTM, and ECMO. In the PSM cohort, women were less likely to undergo CAG and PCI (6.4% vs. 9.1%, p<0.001 and 1.9% vs. 3.7%, p<0.001). The duration of cardiopulmonary resuscitation was shorter in women (19 vs. 20 min, p<0.001). TTM, ECMO use, and survival outcomes did not differ significantly between sexes. The subgroup analysis according to age showed that among patients aged <65 years, women were less likely than men to undergo CAG and PCI (12.7% vs. 19.2%, p<0.001 and 2.3% vs. 8.1%, p<0.001) CONCLUSIONS: In the PSM cohort, women with OHCA underwent CAG and PCI less frequently than men, regardless of the initial rhythm. However, these sex-related differences

narrowed with increasing age. Further studies are needed to confirm the sex-related disparities in the in-hospital management of patients with OHCA.

Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) in Non-Traumatic Cardiac Arrest: A Narrative Review of Known and Potential Physiological Effects.
Mazzoli CA(1), Chiarini V(1), Coniglio C(1), Lupi C(1), Tartaglione M(1), Gamberini L(1), Semeraro F(1), Gordini G(1).
ABSTRACT
Resuscitative endovascular balloon occlusion of the aorta (REBOA) is widely used in acute trauma care worldwide and has recently been proposed as an adjunct to standard treatments during cardiopulmonary resuscitation in patients with non-traumatic cardiac arrest (NTCA). Several case series have been published highlighting promising results, and further trials are starting. REBOA during CPR increases cerebral and coronary perfusion pressure by increasing the afterload of the left ventricle, thus improving the chances of ROSC and decreasing hypoperfusion to the brain. In addition, it may facilitate the termination of malignant arrhythmias by stimulating baroreceptor reflex. Aortic occlusion could mitigate the detrimental neurological effects of adrenaline, not only by increasing cerebral perfusion but also reducing the blood dilution of the drug, allowing the use of lower doses. Finally, the use of a catheter could allow more precise hemodynamic monitoring during CPR and a faster transition to ECPR. In conclusion, REBOA in NTCA is a feasible technique also in the prehospital setting, and its use deserves further studies, especially in terms of survival and good neurological outcome, particularly in resource-limited settings.

IN-HOSPITAL CARDIAC ARREST

In-hospital cardiac arrests admitted alive in intensive care units: Insights from the CubRéa database.
Bailleul C(1), Puymirat E(2), Aegerter P(3), Guidet B(4), Guerot E(1), Augy JL(1), Brechot N(5), Diehl JL(1), Fagon JY(1), Hermann B(1), Novara A(1), Ortuno S(1), Younan R(1), Danchin N(2), Cariou A(6), Aissaoui N(7).
ABSTRACT
BACKGROUND: In-hospital cardiac arrest(IHCA) has received little attention compared with out-of-hospital cardiac arrest. AIM: To address the paucity of data on IHCA patients, we examined key features, variations in mortality and predictors of death among patients admitted in French intensive care units(ICUs) from 1997 to 2015. METHODS: Using the database of the Collège des Utilisateurs de Bases de données en Réanimation(CUB-Réa) that prospectively collects data from ICUs in the greater Paris area, we determined temporal trends in the incidence of IHCA, patients' outcomes, crude and Simplified Acute Physiology Score(SAPS)-II Standardized mortality and predictors of in-ICU mortality. RESULTS: Of the 376,325 ICU admissions, 15,324(4.08%) had IHCA, with incidence increasing from 2.78% to 3.83%(p < 0.001). Over time, the patient age increased by 0.7 years(p = 0.04) and SAPS-II increased by 2.3%(p < 0.001). Crude in-ICU mortality decreased from 78% to 62.5% over the past 18 years(p < 0.001). The SAPS-II-standardized mortality also decreased over time from 78.4% to 68.3%(p < 0.001) representing a 10.1% relative decrease from 1997 to 2015. In multivariate analysis, admission in a more recent time-period was an independent correlate of decreased mortality(OR 0.40, 95%CI 0.35-0.46). CONCLUSION: Occurrence of IHCA increased over time but remains an uncommon reason for being admitted to ICU. From 1997 to 2015, we observed a change in patient profile, with older and more critically ill patients, despite which in-ICU mortality has substantially

decreased in IHCA patients, likely resulting from a global improvement in the process of care and more widespread implementation of rapid response teams.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. Am J Emerg Med. 2022 Feb 9:S0735-6757(22)00102-4. doi: 10.1016/j.ajem.2022.02.017. Online ahead of print.
Etiology affects predictors of survival for out-of-hospital cardiac arrest.
Shekhar AC(1), Campbell T(2), Mann NC(3), Blumen I(2).
NO ABSTRACT AVAILABLE

2. J Surg Res. 2022 Feb 15;274:185-195. doi: 10.1016/j.jss.2022.01.007. Online ahead of print.
Intraoperative Deaths: Who, Why, and Can We Prevent Them?
Dorken Gallastegi A(1), Mikdad S(2), Kapoen C(2), Breen KA(1), Naar L(1), Gaitanidis A(1), El Hechi M(1), Pian-Smith M(3), Cooper JB(3), Antonelli DM(4), MacKenzie O(4), Del Carmen MG(5), Lillemoe KD(6), Kaafarani HMA(7).
ABSTRACT
INTRODUCTION: Intraoperative deaths (IODs) are rare but catastrophic. We systematically analyzed IODs to identify clinical and patient safety patterns. METHODS: IODs in a large academic center between 2015 and 2019 were included. Perioperative details were systematically reviewed, focusing on (1) identifying phenotypes of IOD, (2) describing emerging themes immediately preceding cardiac arrest, and (3) suggesting interventions to mitigate IOD in each phenotype. RESULTS: Forty-one patients were included. Three IOD phenotypes were identified: trauma (T), nontrauma emergency (NT), and elective (EL) surgery patients, each with 2 sub-phenotypes (e.g., ELm and ELv for elective surgery with medical arrests or vascular injury and bleeding, respectively). In phenotype T, cardiopulmonary resuscitation was initiated before incision in 42%, resuscitative thoracotomy was performed in 33%, and transient return of spontaneous circulation was achieved in 30% of patients. In phenotype NT, ruptured aortic aneurysms accounted for half the cases, and median blood product utilization was 2,694 mL. In phenotype ELm, preoperative evaluation did not include electro-cardiogram in 12%, cardiac consultation in 62%, stress test in 87%, and chest x-ray in 37% of patients. In phenotype ELv, 83% had a single peripheral intravenous line, and vascular injury was almost always followed by escalation in monitoring (e.g., central/arterial line), alert to the blood bank, and call for surgical backup. CONCLUSIONS: We have created a framework for IOD that can help with intraoperative safety and quality analysis. Focusing on interventions that address appropriateness versus futility in care in phenotypes T and NT, and on prevention and mitigation of intraoperative vessel injury (e.g., intraoperative rescue team) or preoperative optimization in phenotype EL may help prevent IODs.

3. J Card Fail. 2022 Feb 14:S1071-9164(22)00051-3. doi: 10.1016/j.cardfail.2022.01.019. Online ahead of print.
Ventricular arrhythmias and sudden death in non-ischemic dilated cardiomyopathy: matter of sex or scar?

Marco AD(1), Brown PF(2), Claver E(3), Bradley J(2), Nucifora G(2), María RuizCueto(3), Dallaglio PD(3), Rodriguez M(3), Comin-Colet J(3), Anguera I(3), Miller CA(4), Schmitt M(5).

ABSTRACT

AIMS: To evaluate the association between sex and ventricular arrhythmias (VA) or sudden death (SD) in non-ischemic dilated cardiomyopathy, including analysis of potential confounders. METHODS: Retrospective cohort study of consecutive patients with DCM referred for cardiac magnetic resonance (CMR) at two tertiary hospitals. The primary combined endpoint encompassed sustained VA, appropriate ICD therapies, resuscitated cardiac arrest and SD. RESULTS: We included 1165 patients with median follow-up of 36 months (interquartile range 20-58 months). The majority of patients (66%) were males. Males and females had similar LVEF but the prevalence of late gadolinium enhancement (LGE) at CMR was significantly higher among males (48% vs 30%, p<0.001). Males had higher cumulative incidence of the primary endpoint (8% vs 4%, p=0.02) and male sex was a significant predictor of the primary endpoint at univariate analysis (HR 1.93, p=0.02). However, LGE had a major confounding effect in the association between sex and the primary outcome: the HR of male sex adjusted for LGE was 1.29 (p=0.37). LGE+ females had significantly higher cumulative incidence of the primary endpoint than LGE- males (13% vs 1.8%, p<0.001). CONCLUSIONS: In patients with DCM, the prevalence of LGE is significantly higher among males, implying a major confounding effect in the association between male sex and VA or SD. LGE+ females have significantly higher risk than LGE- males. These data do not support the inclusion of sex into risk-stratification algorithms for VA or SD in DCM.

In-Hospital and One-Year Outcomes of Patients after Early and Late Resuscitated Cardiac Arrest Complicating Acute Myocardial Infarction-Data from a Nationwide Database.
Kowalik R(1), Gierlotka M(2), Ozierański K(1), Trzeciak P(3), Fojt A(1), Feusette P(2), Tycińska A(4), Opolski G(1), Grabowski M(1), Gąsior M(3).

ABSTRACT

The prognostic role of early (less than 48 h) resuscitated cardiac arrest (ErCA) complicating acute myocardial infarction (AMI) is still controversial. The present study aimed to analyse the short-term and one-year outcomes of patients after ErCA and late resuscitated cardiac arrest (LrCA) compared to patients without cardiac arrest (CA) complicating AMI. Data from the prospective nationwide Polish Registry of Acute Coronary Syndromes (PL-ACS) were used to assess patients with resuscitated cardiac arrest (rCA) after AMI. Baseline clinical characteristics and the predictors of all-cause death were assessed. The all-cause mortality rate, complications, performed procedures, and re-hospitalisations were assessed for the in-hospital period, 30 days after discharge, and 6- and 12-month follow-ups. Among 167,621 cases of AMI, CA occurred in 3564 (2.1%) patients, that is, 3100 (87%) and 464 (13%) patients with ErCA and LrCA, respectively. The mortality rates in the ErCA vs. LrCA and CA vs. non-CA groups were as follows: in-hospital: 32.1% vs. 59.1% (p < 0.0001) and 35.6% vs. 6.0% (p < 0.0001); 30-day: 2.2% vs. 3.2% (p = 0.42) and 9.9% vs. 5.2% (p < 0.0001); 6-month: 9.2% vs. 17.9% (p = 0.0001) and 12.3% vs. 21.1% (p < 0.0001); and 12-month: 12.3% vs. 21.1% (p = 0.001) and 13% vs. 7.7% (p < 0.0001), respectively. ErCA (hazard ratio (HR): 1.54, confidence interval (CI):1.28-1.89; p < 0.0001) and LrCA (HR: 2.34, CI: 1.39-3.93; p = 0.001) increased the risk of 12-month mortality. During the 12-month follow-up, patients after LrCA more frequently required hospitalisation due to heart failure compared to patients after ErCA. ErCA was related to a higher hospitalisation rate due to coronary-related causes and a higher rate of percutaneous coronary intervention. An episode of LrCA was associated with higher in-hospital and long-term mortality compared to ErCA. ErCA and LrCA were independent risk factors for one-year mortality.

Cardiac Arrest during Interventional Radiology Procedures: A 7-Year Single-Center Retrospective Study.
Nam IC(1), Lee ES(2), Shin JH(3), Li VX(2), Chu HH(3), Park SE(1), Won JH(4).

ABSTRACT

An intervention radiology (IR) unit collected cardiac arrest data between January 2014 and July 2020. Of 344,600 procedures, there were 23 cardiac arrest patients (0.0067%). The patient data was compared to a representative sample (N = 400) of the IR unit to evaluate the incidence and factors associated with cardiac arrest during IR procedures. Age, procedure urgency, American Society of Anesthesiologists (ASA) physical status, procedure type, and underlying medical conditions were identified as valuable predictors of a patient's susceptibility to cardiac arrest during an IR procedure. The proportion of pediatrics was higher for cardiac arrest patients, and most required immediate procedures. The distribution of high ASA physical status (III or greater) was skewed compared to that of the non-cardiac arrest patients. Vascular procedures were associated with higher risk than non-vascular procedures. The patients who underwent non-transarterial chemoembolization arterial procedures demonstrated relative risks of 4.4 and 11.7 for cardiac arrest compared to biliary procedures and percutaneous catheter drainage, respectively. In addition, the six patients (26.1%) who died before discharge all underwent vascular procedures. Relative to patients with acute kidney injury, patients with malignancy, hypertension, and diabetes mellitus demonstrated relative risks of 3.3, 3.4, and 4.8 for cardiac arrest, respectively.

The association between alcohol intake shortly before arrest and survival outcomes of out-of-hospital cardiac arrest.
Hyun Choi D(1), Sun Ro Y(2), Hong Kim K(3), Ho Park J(4), Jeong J(5), Jeong Hong K(6), Jun Song K(7), Do Shin S(8).

ABSTRACT

INTRODUCTION: Alcohol intake is one of the triggers of out-of-hospital cardiac arrest (OHCA) and is associated with survival outcomes due to its relationship with cardiovascular conditions such as variant angina and arrhythmias. The aim of this study was to evaluate the association between alcohol intake shortly before cardiac arrest and survival outcomes after OHCA. METHODS: This observational study was conducted using a nationwide OHCA registry database in Korea. All adult OHCA patients with presumed cardiac etiology from 2016 to 2019 were analyzed. The primary outcome was survival to hospital discharge. Secondary outcomes included coronary angiography (CAG), percutaneous coronary intervention (PCI), and implantable cardioverter-defibrillator (ICD) implantation. Groups with and without alcohol intake shortly before cardiac arrest were compared using propensity score matching and conditional logistic regression analysis. RESULTS: Among the study population of 83,087, 1,777 (2.1%) patients consumed alcohol shortly before OHCA. In the propensity score-matched population, the group with alcohol intake showed significantly higher odds of survival to hospital discharge compared to the group without alcohol intake (OR (95% CI): 1.33 (1.15-1.53)). The odds of receiving CAG without PCI and ICD implantation were significantly higher in the group with alcohol intake compared to the group without alcohol intake (OR (95% CI): 1.60 (1.34-1.92) and 1.74 (1.28-2.37), respectively), while the odds of receiving CAG with PCI were significantly lower (OR (95% CI): 0.75 (0.59-0.95)). CONCLUSION: In OHCA patients with presumed cardiac etiology, alcohol intake shortly before arrest was associated with higher odds of survival outcomes.

<u>**END-TIDAL CO$_2$**</u>

No articles identified.

<u>**ORGAN DONATION**</u>

No articles identified.

<u>**FEEDBACK**</u>

1. J Am Heart Assoc. 2022 Feb 15;11(4):e023232. doi: 10.1161/JAHA.121.023232. Epub 2022 Feb 12.
Inverse Association Between Bystander Use of Audiovisual Feedback From an Automated External Defibrillator and Return of Spontaneous Circulation.

Obling L(1), Hassager C(1)(2), Blomberg SN(3), Folke F(2)(3)(4).

ABSTRACT

Background Treatment with an automated external defibrillator (AED) improves outcome in out-of-hospital cardiac arrest (OHCA). Audiovisual feedback from an AED may assist bystanders achieve higher quality cardiopulmonary resuscitation. However, the association between audiovisual feedback and clinical outcomes is not well assessed in real-life OHCA. The aim of this study was to assess the association between audiovisual feedback from an AED used in bystander resuscitation with rates of return of spontaneous circulation (ROSC) and 30-day survival in a real-life cohort of patients with OHCA. Methods and Results We included 325 patients treated with bystander AED use before arrival of emergency medical services during 2016 to 2019 from the Capital Region of Denmark. Patients were divided into a "feedback" and a "nonfeedback" group, depending on presence of audiovisual feedback from the AED. Audiovisual feedback was defined as voice prompts with continuous feedback to ongoing resuscitation. Rates of ROSC upon hospital admission and 30-day survival were assessed, and univariate and multivariable models were applied to decide the association to audiovisual feedback. Multivariable models were adjusted for sex, age, primary heart rhythm, and location of OHCA. A total of 155 (48%) patients had a bystander AED applied with audiovisual feedback and 170 (52%) without audiovisual feedback. A lower rate of ROSC was found in the feedback group compared with the nonfeedback group (33% [n=51] versus 45% [n=76]; P=0.03). No association was observed between AV feedback and 30-day survival (feedback=27% [n=42] and nonfeedback=31% [n=53]; P=0.49). In the unadjusted logistic regression model, audiovisual feedback was associated with a decreased chance of ROSC (odds ratio, 0.61; 95% CI, 0.38-0.95; P=0.03), which remained significant after adjusted analysis (odds ratio, 0.53; 95% CI, 0.29-0.97; P=0.04), whereas we found no significant association between audiovisual feedback and 30-day survival in the unadjusted and adjusted analyses. Conclusions Audiovisual feedback from an AED used by bystanders was associated with a lower chance of ROSC at hospital admission, but we found no significant difference in 30-day survival. Focus on early and correct bystander cardiopulmonary resuscitation and AED use remain key for OHCA survival.

<u>**DRUGS**</u>

No articles identified.

TRAUMA

1. J Clin Med. 2022 Feb 4;11(3):831. doi: 10.3390/jcm11030831.

Epidemiology and Outcome of Pediatric Out-of-Hospital Cardiac Arrest after Traffic Collision in Japan: A Population-Based Study.

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

ABSTRACT

The epidemiological and clinical characteristics, treatments, and outcomes of patients with traumatic out-of-hospital cardiac arrests (OHCAs) following traffic collisions have not been adequately investigated in Japan. We analyzed the All-Japan Utstein Registry data of 918 pediatric patients aged <20 years with OHCAs following traffic collisions who were resuscitated by bystanders or emergency medical service personnel and were subsequently transported to hospitals between 2013 and 2019. Multiple logistic regression analysis was used to assess factors potentially associated with 1-month survival after OHCA. The 1-month survival rate was 3.3% (30/918), and the rate of neurologically favorable outcomes was 0.7% (60/918). The proportion of 1-month survival of all OHCAs after traffic collision origin did not significantly increase (from 1.9% (3/162) in 2013 to 4.5% (5/111) in 2019), and the adjusted odds ratio (OR) for a 1-year increment was 1.13 (95% confidence interval (CI) 0.93 to 1.37). In a multivariate analysis, ventricular fibrillation arrests and pulseless electrical activity (PEA) were significant predictors of 1-month outcome after OHCAs due to traffic collision. From a large OHCA registry in Japan, we demonstrated that 1-month survival after OHCAs due to traffic collision origin was approximately 3%, and some children even gained full recovery of neurological function.

2. J Clin Med. 2022 Jan 29;11(3):745. doi: 10.3390/jcm11030745.

Survival Trends in Adults with Out-of-Hospital Cardiac Arrests after Traffic Collisions in Japan: A Population-Based Study.

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

ABSTRACT

The 1-month survival rate from out-of-hospital cardiac arrest (OHCA) of cardiac origin has reportedly improved recently, at ≥5%. However, the characteristics of patients with OHCA after a traffic collision have not been adequately evaluated in Japan. We analyzed the All-Japan Utstein Registry data of 12,577 adult patients aged ≥ 20 years with OHCA due to traffic collisions who were resuscitated by emergency medical service personnel or bystanders and were then transported to medical institutions between 2013 and 2019. Multiple logistic regression analysis was used to assess factors potentially associated with the 1-month survival rate after OHCA. The 1-month survival rate was 1.4% (174/12,577). The proportion of 1-month survival of all OHCAs after a traffic collision origin did not increase significantly (from 1.6% [30/1919] in 2013 to 1.8% [25/1702] in 2019), and the adjusted odds ratio for 1-year increments was 1.04 (95% confidence interval, 0.96-1.12). In multivariate analysis, men who received ventricular fibrillation, pulseless electrical activity, intravenous fluid replacement, or early emergency medical service response and had a traffic collision during daytime had significantly favorable 1-month outcomes. In Japan, the 1-month survival after OHCA of a traffic collision origin was lower than that of a cardiac origin and remains stable.

VENTILATION

1. JAMA Netw Open. 2022 Feb 1;5(2):e2148871. doi: 10.1001/jamanetworkopen.2021.48871.

Effect of Placement of a Supraglottic Airway Device vs Endotracheal Intubation on Return of Spontaneous Circulation in Adults With Out-of-Hospital Cardiac Arrest in Taipei, Taiwan: A Cluster Randomized Clinical Trial.

Lee AF(1), Chien YC(2), Lee BC(3), Yang WS(4), Wang YC(4), Lin HY(1), Huang EP(5), Chong KM(1), Sun JT(6), Huei-Ming M(1)(7), Hsieh MJ(1), Chiang WC(1)(7).

ABSTRACT

IMPORTANCE: Prehospital advanced airway management with either initial endotracheal intubation (ETI) or initial supraglottic airway (SGA) insertion in patients with out-of-hospital cardiac arrest (OHCA) remains controversial. OBJECTIVE: To compare the effectiveness of ETI and SGA in patients with nontraumatic OHCA. DESIGN, SETTING, AND PARTICIPANTS: The Supraglottic Airway Device vs Endotracheal intubation (SAVE) trial was a multicenter cluster randomized clinical trial conducted in Taipei City, Taiwan. Individuals aged 20 years or older who experienced nontraumatic OHCA requiring advanced airway management and were treated by participating emergency medical service agencies were enrolled from November 11, 2016, to December 31, 2019. The final day of follow-up was February 19, 2020. INTERVENTIONS: Four advanced life support ambulance teams were divided into 2 randomization clusters, with each cluster assigned to either ETI or SGA in a biweekly period. MAIN OUTCOMES AND MEASURES: The primary outcome of the SAVE trial was sustained return of spontaneous circulation (ROSC) (≥2 hours) after resuscitation. Secondary outcomes included prehospital ROSC, survival to hospital discharge, and favorable neurologic outcome, defined as a cerebral performance category score less than or equal to 2. Prespecified subgroups and the association between time to advanced airways were explored. Per protocol and intention-to-treat analysis were performed. RESULTS: A total of 936 patients (517 in the ETI group and 419 in the SGA group) were included in the primary analysis (median age, 77 [IQR, 62-85] years; 569 men [60.8%]). The first-attempt airway success rates were 77% with ETI (n = 413) and 83% with SGA (n = 360). Sustained ROSC was 26.9% (n = 139) in the ETI group vs 25.8% (n = 108) in the SGA group. The odds ratio of sustained ROSC was 1.02 (95% CI, 0.98-1.06) in the ETI group vs SGA group. The odds ratio of ETA vs SGA was 1.04 (95% CI, 1.02-1.07) for prehospital ROSC, 1.00 (95% CI, 0.94-1.06) for survival to hospital discharge, and 0.99 (95% CI, 0.94-1.03) for cerebral performance category scores less than or equal to 2. CONCLUSIONS AND RELEVANCE: In this randomized clinical trial, among patients with OHCA, initial airway management with ETI did not result in a favorable outcome of sustained ROSC compared with SGA device insertion.

Trends in Endotracheal Intubation During In-Hospital Cardiac Arrests: 2001-2018.
Schwab K(1), Buhr RG(1)(2), Grossetreuer AV(3), Balaji L(3), Lee ES(4), Moskowitz AL(3)(5); American Heart Association's Get With the Guidelines-Resuscitation Investigators.

ABSTRACT

OBJECTIVES: Airway management during in-hospital cardiac arrest represents a fundamental component of resuscitative efforts, yet little is known about temporal trends in intubation during in-hospital cardiac arrest. Our objective was to investigate changes in in-hospital cardiac arrest airway management over time and in response to national guideline updates. DESIGN: Observational cohort study of a prospectively collected database. SETTING: Multicenter study of hospitals participating in the "Get With The Guidelines-Resuscitation" registry from January 1, 2001, to December 31, 2018. SUBJECTS: Adult patients who experienced an in-hospital cardiac arrest and did not have an invasive airway in place prior to the arrest. INTERVENTIONS: The primary outcome was the rate of intra-arrest intubation from 2001 to 2018. We constructed multivariable regression models with generalized estimating equations to determine the annual adjusted odds of intubation. We also assessed the timing of intubation relative to the onset of pulselessness and other arrest measures. We used an interrupted time-series analysis to assess the association between the 2010 Advanced Cardiac Life Support guideline update and intubation rates. MEASUREMENTS AND MAIN RESULTS: One thousand sixty-six eight hundred patients from 797 hospitals were included. From 2001 to 2018,

the percentage of patients intubated during an arrest decreased from 69% to 55% for all rhythms, 73% to 60% for nonshockable rhythms, and 58% to 36% for shockable rhythms (p < 0.001 for trend for all 3 groups). The median time from onset of pulselessness to intubation increased from 5 minutes in 2001 (interquartile range, 2-8 min) to 6 minutes in 2018 (interquartile range, 4-10 min) (p < 0.001 for trend). Following the 2010 guideline update, there was a downward step change and a steeper decrease over time in the rate of intubation as compared to the preintervention period (p < 0.001). CONCLUSIONS: Endotracheal intubation rates during in-hospital cardiac arrest have decreased significantly over time, with a more substantial decline following the updated 2010 guideline that prioritized chest compressions over airway management.

CERERBRAL MONITORING

No articles identified.

ULTRASOUND AND CPR

1. Front Med (Lausanne). 2022 Jan 28;8:690405. doi: 10.3389/fmed.2021.690405. eCollection 2021.
The Utility of a Point-of-Care Transcranial Doppler Ultrasound Management Algorithm on Outcomes in Pediatric Asphyxial Out-of-Hospital Cardiac Arrest - An Exploratory Investigation.
Lin JJ(1)(2)(3)(4), Kuo HC(5)(6), Hsia SH(1), Lin YJ(5)(6), Wang HS(3), Hsu MH(6)(7), Chiang MC(2)(4)(8), Chan OW(1), Lee EP(1), Lin KL(3).
ABSTRACT
BACKGROUND: Transcranial Doppler ultrasound is a sensitive, real time tool used for monitoring cerebral blood flow; it could provide additional information for cerebral perfusion in cerebral resuscitation during post cardiac arrest care. The aim of the current study was to evaluate the utility of a point-of-care transcranial Doppler ultrasound management algorithm on outcomes in pediatric asphyxial out-of-hospital cardiac arrest. METHODS: This retrospective cohort study was conducted in two tertiary pediatric intensive care units between January 2013 and June 2018. All children between 1 month and 18 years of age with asphyxial out-of-hospital cardiac arrest and a history of at least 3 min of chest compressions, who were treated with therapeutic hypothermia and survived for 12 h or more after the return of circulation were eligible for inclusion. RESULTS: Twenty-one patients met the eligibility criteria for the study. Sixteen (76.2%) of the 21 children were male, and the mean age was 2.8 ± 4.1 years. Seven (33.3%) of the children had underlying disorders. The overall 1-month survival rate was 52.4%. Twelve (57.1%) of the children received point-of-care transcranial Doppler ultrasound. The 1-month survival rate was significantly higher (p = 0.03) in the point-of-care transcranial Doppler ultrasound group (9/12, 75%) than in the non-point-of-care transcranial Doppler ultrasound group (2/9, 22.2%). CONCLUSIONS: Point-of-care transcranial Doppler ultrasound group was associated with a significantly better 1-month survival rate compared with no point-of-care transcranial Doppler ultrasound group in pediatric asphyxial out-of-hospital cardiac arrest.

ORGANISATION AND TRAINING

1. Ann N Y Acad Sci. 2022 Feb 18. doi: 10.1111/nyas.14740. Online ahead of print.
Guidelines and standards for the study of death and recalled experiences of death--a multidisciplinary consensus statement and proposed future directions.

Parnia S(1), Post SG(2), Lee MT(3), Lyubomirsky S(4), Aufderheide TP(5), Deakin CD(6), Greyson B(7), Long J(8), Gonzales AM(1), Huppert EL(1), Dickinson A(1), Mayer S(9), Locicero B(2), Levin J(10), Bossis A(11), Worthington E(12), Fenwick P(13), Shirazi TK(1).

ABSTRACT

An inadvertent consequence of advances in stem cell research, neuroscience, and resuscitation science has been to enable scientific insights regarding what happens to the human brain in relation to death. The scientific exploration of death is in large part possible due to the recognition that brain cells are more resilient to the effects of anoxia than assumed. Hence, brain cells become irreversibly damaged and "die" over hours to days postmortem. Resuscitation science has enabled life to be restored to millions of people after their hearts had stopped. These survivors have described a unique set of recollections in relation to death that appear universal. We review the literature, with a focus on death, the recalled experiences in relation to cardiac arrest, post-intensive care syndrome, and related phenomena that provide insights into potential mechanisms, ethical implications, and methodologic considerations for systematic investigation. We also identify issues and controversies related to the study of consciousness and the recalled experience of cardiac arrest and death in subjects who have been in a coma, with a view to standardize and facilitate future research.

Assessment of emergency physicians' performance in identifying shockable rhythm in out-of-hospital cardiac arrest: an observational simulation study.

Derkenne C(1), Jost D(2), Roquet F(3), Corpet P(4), Frattini B(2), Kedzierewicz R(2), Bellec G(5), Rajon B(6), Fernandez M(7), Loeb T(8), Pierantoni E(9), Lamblin A(10), Prunet B(2)(11); Paris Fire Brigade Cardiac Arrest Task Force.

ABSTRACT

BACKGROUND: Emergency physicians can use a manual or an automated defibrillator to provide defibrillation of patients who had out-of-hospital cardiac arrest (OHCA). Performance of emergency physicians in identifying shockable rhythm with a manual defibrillator has been poorly explored whereas that of automated defibrillators is well known (sensitivity 0.91-1.00, specificity 0.96-0.99). We conducted this study to estimate the sensitivity/specificity and speed of shock/no-shock decision-making by prehospital emergency physicians for shockable or non-shockable rhythm, and their preference for manual versus automated defibrillation. METHODS: We developed a web application that simulates a manual defibrillator (https://simul-shock.firebaseapp.com/). In 2019, all (262) emergency physicians of six French emergency medical services were invited to participate in a study in which 60 ECG rhythms from real OHCA recordings were successively presented to the physicians for determination of whether they would or would not administer a shock. Time to decision was recorded. Answers were compared with a gold standard (concordant answers of three experts). We report sensitivity for shockable rhythms (decision to shock) and specificity for non-shockable rhythms (decision not to shock). Physicians were also asked whether they preferred manual or automated defibrillation. RESULTS: Among 215 respondents, we were able to analyse results for 190 physicians. 57% of emergency physicians preferred manual defibrillation. Median (IQR) sensitivity for a shock delivery for shockable rhythm was 0.91 (0.81-1.00); median specificity for no-shock delivery for non-shockable rhythms was 0.91 (0.80-0.96). More precisely, sensitivities for shock delivery for ventricular tachycardia (VT) and coarse ventricular fibrillation (VF) were both 1.0 (1.0-1.0); sensitivity for fine VF was 0.6 (0.2-1). Specificity for not shocking a pulseless electrical activity (PEA) was 0.83 (0.72-0.86), and for asystole, specificity was 0.93 (0.86-1). Median speed of decision-making (in seconds) were: VT 2.0 (1.6-2.7), coarse VF 2.1 (1.7-2.9), asystole 2.4 (1.8-3.5),

PEA 2.8 (2.0-4.2) and fine VF 2.8 (2.1-4.3). CONCLUSIONS: Global sensitivity and specificity were comparable with published automated external defibrillator studies. Shockable rhythms with the best clinical prognoses (VT and coarse VF) were very rapidly recognised with very good sensitivity. The decision-making for fine VF or asystole and PEA was less accurate.

3. Eur Heart J. 2022 Feb 15:ehac028. doi: 10.1093/eurheartj/ehac028. Online ahead of print.
Volunteer first responders for out-of-hospital cardiac arrest at home: the missing link for improved survival?
Hansen CM(1)(2), Folke F(2)(3).
NO ABSTRACT AVAILABLE

4. J Clin Med. 2022 Jan 27;11(3):646. doi: 10.3390/jcm11030646.
Randomized Comparison of Two New Methods for Chest Compressions during CPR in Microgravity-A Manikin Study.
Schmitz J(1)(2)(3)(4)(5), Ahlbäck A(6), DuCanto J(7), Kerkhoff S(1)(2)(3)(4), Komorowski M(8), Löw V(1), Russomano T(9), Starck C(4)(10), Thierry S(4)(11), Warnecke T(12), Hinkelbein J(1)(2)(3)(4).
ABSTRACT
BACKGROUND: Although there have been no reported cardiac arrests in space to date, the risk of severe medical events occurring during long-duration spaceflights is a major concern. These critical events can endanger both the crew as well as the mission and include cardiac arrest, which would require cardiopulmonary resuscitation (CPR). Thus far, five methods to perform CPR in microgravity have been proposed. However, each method seems insufficient to some extent and not applicable at all locations in a spacecraft. The aim of the present study is to describe and gather data for two new CPR methods in microgravity. MATERIALS AND METHODS: A randomized, controlled trial (RCT) compared two new methods for CPR in a free-floating underwater setting. Paramedics performed chest compressions on a manikin (Ambu Man, Ambu, Germany) using two new methods for a free-floating position in a parallel-group design. The first method (Schmitz-Hinkelbein method) is similar to conventional CPR on earth, with the patient in a supine position lying on the operator's knees for stabilization. The second method (Cologne method) is similar to the first, but chest compressions are conducted with one elbow while the other hand stabilizes the head. The main outcome parameters included the total number of chest compressions (n) during 1 min of CPR (compression rate), the rate of correct chest compressions (%), and no-flow time (s). The study was registered on clinicaltrials.gov (NCT04354883). RESULTS: Fifteen volunteers (age 31.0 ± 8.8 years, height 180.3 ± 7.5 cm, and weight 84.1 ± 13.2 kg) participated in this study. Compared to the Cologne method, the Schmitz-Hinkelbein method showed superiority in compression rates (100.5 ± 14.4 compressions/min), correct compression depth (65 ± 23%), and overall high rates of correct thoracic release after compression (66% high, 20% moderate, and 13% low). The Cologne method showed correct depth rates (28 ± 27%) but was associated with a lower mean compression rate (73.9 ± 25.5/min) and with lower rates of correct thoracic release (20% high, 7% moderate, and 73% low). CONCLUSIONS: Both methods are feasible without any equipment and could enable immediate CPR during cardiac arrest in microgravity, even in a single-helper scenario. The Schmitz-Hinkelbein method appears superior and could allow the delivery of high-quality CPR immediately after cardiac arrest with sufficient quality.

5. Am J Emerg Med. 2022 Feb 5;54:127-130. doi: 10.1016/j.ajem.2022.01.068. Online ahead of print.
Unrecognized cardiac arrests: A one-year review of audio from emergency medical dispatch calls.
Crabb DB(1), Elmelige YO(2), Gibson ZC(3), Ralston DC(4), Harrell C(5), Cohen SA(6), Fitzpatrick DE(7), Becker TK(8).

ABSTRACT

OBJECTIVES: Immediate recognition of out-of-hospital cardiac arrest (OHCA) by Emergency Medical Dispatch (EMD) operators is crucial to facilitate timely initiation of telephone cardiopulmonary resuscitation (T-CPR) and to enable the appropriate level of Emergency Medical Services (EMS) response. The goal of this study was to identify patterns that can increase EMD-level recognition of cardiac arrests prior to EMS arrival. METHODS: The Combined Communications Center in Alachua County, Florida provided audio recordings of all emergency calls from January 1, 2018 to November 16, 2018 dispatched as a chief complaint other than OHCA, but later identified as cardiac arrest. A multi-disciplinary medical team transcribed and analyzed the calls to determine common themes and trends. RESULTS: Out of an initial 81 calls meeting inclusion criteria, 69 were immediately recognized as OHCA by EMDs, leaving 12 calls of unrecognized OHCA. In 11 of 12 calls respiratory issues were described to EMD. In 10 of 12 calls the subject was described as unconscious, and in the other 2 calls, the subject lost consciousness during the call. CONCLUSIONS: Lack of recognition of OHCA by EMD occurred in most calls due to difficulty communicating the subject's respiratory status. Further emphasis should be placed on identifying non-viable respirations in unconscious patients in EMD training and algorithms to increase recognition of OHCA and initiation of T-CPR. A multi-year review of a comparable dataset from geographically and socioeconomically diverse regions in the United States can validate and expand these preliminary trends.

Effect of Implementing Decision Support to Activate a Rapid Response System by Automated Screening of Verified Vital Sign Data: A Retrospective Database Study.

Jerng JS(1), Chen LC(2), Chen SY(3), Kuo LC(4), Tsan CY(5), Hsieh PY(5), Chen CM(6), Chuang PY(7), Huang HF(2), Huang SF(5).

ABSTRACT

AIM: Activating a rapid response system (RRS) at general wards requires memorizing trigger criteria, identifying deterioration, and timely notification of abnormalities. We aimed to assess the effect of decision support (DS)-linked RRS activation on management and outcomes. METHODS: We retrospectively analyzed general ward RRS activation cases from 2013 to 2017 and the incidence of cardiopulmonary resuscitations (CPR) from 2013 to 2020. A DS-alerting mechanism was added to the conventional RRS activation process in 2017, with an alert window appearing whenever the system automatically detected any verified abnormal vital sign entry, alerting the nurse to take further action. Logistic and linear regression analyses were used to compare outcomes. RESULTS: We analyzed 27,747 activations and 64,592 DS alerts. RRS activations increased from 3.5 to 30.3 per 1,000 patient-days (P<0.001) after DS implementation. The first DS activations occurred earlier than conventional ones (-2.9 days, 95% confidence interval=-3.6 to -2.1 days). After adjustment with inverse probability of treatment weighting, main (conventional vs DS-linked activations after implementation) and sensitivity analyses showed that DS activation cases had a lower risk of CPR and in-hospital mortality. Cases with more DS alerts before RRS activation had a higher risk of CPR (P trend=0.017) and in-hospital mortality (P trend<0.001). The incidence of CPR at the general ward decreased. CONCLUSION: Implementing a DS mechanism with an automated screening of verified abnormal vital signs linked to RRS activations at general wards was associated with improved practice and timeliness of hospital-wide RRS activations and reduced in-hospital resuscitations and mortality.

Resuscitation 2020: Proceedings From the NeoHeart 2020 International Conference.

Wyckoff MH(1), Sawyer T(2), Lakshminrusimha S(3), Collins A(4), Ohls RK(5), Leone TA(4).

ABSTRACT

Resuscitation guidelines are developed and revised by medical societies throughout the world. These guidelines are increasingly based on evidence from preclinical and clinical research. The International Liaison Committee on Resuscitation reviews evidence for each resuscitation practice and provides summary consensus statements that inform resuscitation guideline committees. A similar process is used for different populations including neonatal, pediatric, and adult resuscitation. The NeoHeart 2020 Conference brought together experts in resuscitation to discuss recent evidence and guidelines for resuscitation practices. This review summarizes the main focus of discussion from this symposium.

8. Resusc Plus. 2022 Feb 4;9:100209. doi: 10.1016/j.resplu.2022.100209. eCollection 2022 Mar.
Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) decisions in patients admitted through the emergency department in a Swedish University Hospital - An observational study of outcome, patient characteristics and changes in DNACPR decisions.

Piscator E(1), Göransson K(2)(3), Forsberg S(4), Herlitz J(5), Djärv T(2).

ABSTRACT

AIMS: The aims were to examine patient and hospital characteristics associated with Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) decisions for adult admissions through the emergency department (ED), for patients with DNACPR decisions to examine patient and hospital characteristics associated with hospital mortality, and to explore changes in CPR status. METHODS: This was a retrospective observational study of adult patients admitted through the ED at Karolinska University Hospital 1 January to 31 October 2015. RESULTS: The cohort included 25,646 ED admissions, frequency of DNACPR decisions was 11% during hospitalisation. Patients with DNACPR decisions were older, with an overall higher burden of chronic comorbidities, unstable triage scoring, hospital mortality and one-year mortality compared to those without. For patients with DNACPR decisions, 63% survived to discharge and one-year mortality was 77%. Age and comorbidities for patients with DNACPR decisions were similar regardless of hospital mortality, those who died showed signs of more severe acute illness on ED arrival. Change in CPR status during hospitalisation was 5% and upon subsequent admission 14%. For patients discharged with DNACPR decisions, reversal of DNACPR status upon subsequent admission was 32%, with uncertainty as to whether this reversal was active or a consequence of a lack of consideration. CONCLUSION: For a mixed population of adults admitted through the ED, frequency of DNACPR decisions was 11%. Two-thirds of patients with DNACPR decisions were discharged, but one-year mortality was high. For patients discharged with DNACPR decisions, reversal of DNACPR status was substantial and this should merit further attention.

POST-CARDIAC ARREST TREATMENTS

1. Med Klin Intensivmed Notfmed. 2022 Feb 16. doi: 10.1007/s00063-022-00902-y. Online ahead of print.
[Does every patient with cardiac arrest require immediate coronary angiography?].
[Article in German]
Adler C(1), Michels G(2).
NO ABSTRACT AVAILABLE

2. Resuscitation. 2022 Feb 11:S0300-9572(22)00040-5. doi: 10.1016/j.resuscitation.2022.02.005. Online ahead of print.

Long-term prognosis and causes of death among survivors after out-of-hospital cardiac arrest: A population-based longitudinal study.

Cho Y(1), Oh J(2), Shin JH(3), Sik Kim B(4), Park JK(5), Ho Lee J(6), Hwan Kim J(7), Park M(7).'

ABSTRACT
BACKGROUND: We aimed to identify the long-term prognosis and causes of death of out-of-hospital cardiac arrest (OHCA) survivors. METHODS: Using claims data from the National Health Insurance Service (NHIS) database, we included 4,937 OHCA patients (aged ≥18 years) who were hospitalized between January 2005 and December 2015 and had survived for 30 days or more. The endpoints were long-term mortality and causes of death. Subgroup analyses were performed based on whether cardiac procedures were performed, and risk factors associated with cardiac and noncardiac deaths were identified. RESULTS: We followed 4,937 OHCA patients for a median of 3.3 years and up to 14 years of follow-up. The all-cause 1-, 3-, 5-, and 10-year cumulative mortality were 35.2%, 46.5%, 52.3%, and 62.7%, respectively. Regarding the 1,130 OHCA survivors who had undergone cardiac procedures, the all-cause 1-, 3-, 5-, and 10-year cumulative mortality were 10.7%, 16.9%, 21.4%, and 30.6%, respectively. More patients (56.2%) died from noncardiovascular causes than from cardiovascular causes (43.8%) among the 2,738 total patients who had died. The proportion of patients with cardiac death was significantly higher in the patient group with a cardiac procedure than in the group without a cardiac procedure (49.6% vs. 31.7%; P value<0.001). A higher Charlson comorbidity index (CCI) was associated with an increased risk of cardiac mortality in the cardiac procedure group. CONCLUSIONS: The long-term mortality among OHCA survivors remains high, particularly within the first year. Individual characteristics are crucial for the follow-up of OHCA survivors and may help improve their long-term prognosis.

Mindfulness is inversely associated with psychological symptoms in long-term cardiac arrest survivors.

Presciutti A(1)(2), Greenberg J(3)(4), Lester E(3)(4), Newman MM(5), Elmer J(6), Shaffer JA(7), Vranceanu AM(3)(4), Perman SM(8).

ABSTRACT
Identifying correlates of psychological symptoms in cardiac arrest (CA) survivors is a major research priority. In this longitudinal survey study, we evaluated associations between mindfulness, baseline psychological symptoms, and 1-year psychological symptoms in long-term CA survivors. We collected demographic and CA characteristics at baseline. At both timepoints, we assessed posttraumatic stress symptoms (PTS) through the PTSD Checklist-5 (PCL-5) and depression and anxiety symptoms through the Patient Health Questionnaire-4 (PHQ-4). At follow-up, we assessed mindfulness through the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). We used adjusted linear regression to predict 1-year PCL-5 and PHQ-4 scores, with particular consideration of the CAMS-R as a cross-sectional correlate of outcome. We included 129 CA survivors (mean age: 52 years, 52% male, 98% white). At 1-year follow-up, in adjusted models, CAMS-R (β: -0.35, $p < 0.001$) and baseline PCL-5 scores (β: 0.56, $p < 0.001$) were associated with 1-year PCL-5 scores. CAMS-R (β: -0.34, $p < 0.001$) and baseline PHQ-4 scores were associated with 1-year PHQ-4 scores (β: 0.37, $p < 0.001$). In conclusion, mindfulness was inversely associated with psychological symptoms in long-term CA survivors. Future studies should examine the longitudinal relationship of mindfulness and psychological symptoms after CA.

TARGETED TEMPERATURE MANAGEMENT

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.

Mild hypothermia and neurologic outcomes in patients undergoing venoarterial extracorporeal membrane oxygenation.
Al-Kawaz M(1), Shou B(2), Prokupets R(1), Whitman G(2), Geocadin R(1), Cho SM(1).
ABSTRACT

BACKGROUND: Patients with venoarterial extracorporeal membrane oxygenation (VA-ECMO) are at risk of cerebral reperfusion injury after prolonged hypoperfusion and immediate restoration of systemic blood flow. We aimed to examine the impact of mild hypothermia during the first 24 h post-ECMO on neurological outcomes in VA-ECMO patients. METHODS: This was a retrospective study of adult VA-ECMO patients from a tertiary care center. Mild hypothermia was defined as 32-36°C during the first 24 h post-ECMO. The primary outcome was a good neurological function at discharge measured by a modified Rankin Scale ≤3. Multivariable logistic regression analysis was performed for primary outcome adjusting for pre-specified covariates. RESULTS: Overall, 128 consecutive patients with VA-ECMO support (median age: 60 years and 63% males) were included. Within the first 24 h of VA-ECMO cannulation, we found a median of 71 readings per patient (interquartile range 45-88). Eighty-eight patients (68.8%) experienced mild hypothermia within the first 24 h while 18 of those 88 patients (14.2%) had a mean temperature <36°C. ECMO indications included post-cardiotomy shock (39.8%), cardiac arrest (29.7%), and cardiogenic shock (26.6%). Duration of mild hypothermia, but not mean temperature, was independently associated with increased odds of good neurological outcome at discharge (odds ratio [OR] = 1.16, 95% confidence interval [CI] = 1.04-1.31, p = .01) after adjusting for age, the severity of illness, post-ECMO systemic hemorrhage, post-cardiotomy shock, acute brain injury, and mean 24-h PaO2 . Neither duration of mild hypothermia (OR = 0.93, CI = 0.84-1.03, p = .17) nor mean temperature (OR = 0.78, CI = 0.29-2.08, p = .62) was significantly associated with mortality. Similarly, duration of mild hypothermia (p = .47) and mean 24-h temperature (p = .76) were not significantly associated with the frequency of systemic hemorrhages. CONCLUSIONS: In this single-center study, a longer duration of mild hypothermia during the first 24 h of ECMO support was significantly associated with improved neurological outcomes. Mild hypothermia was not associated with an increased risk of systemic hemorrhage or improved survival.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: A scientific statement from the International Liaison Committee on Resuscitation.
Brooks SC, Clegg GR, Bray J, Deakin CD, Perkins GD, Ringh M, Smith CM, Link MS, Merchant RM, Pezo-Morales J, Parr M, Morrison LJ, Wang TL, Koster RW, Ong MEH; International Liaison Committee on Resuscitation.
ABSTRACT
Out-of-hospital cardiac arrest is a global public health issue experienced by ≈3.8 million people annually. Only 8% to 12% survive to hospital discharge. Early defibrillation of shockable rhythms is associated with improved survival, but ensuring timely access to defibrillators has been a significant challenge. To date, the development of public-access defibrillation programs, involving the deployment of automated external defibrillators into the public space, has been the main strategy to address this challenge. Public-access defibrillator programs have been associated with improved outcomes for out-of-hospital cardiac arrest; however, the devices are used in <3% of episodes of out-of-hospital cardiac arrest. This scientific statement was commissioned by the International Liaison Committee on Resuscitation with 3 objectives: (1) identify known barriers to public-access defibrillator use and early defibrillation, (2) discuss established and novel strategies to address those barriers, and (3) identify high-priority knowledge gaps for future research to address. The writing group undertook systematic searches of the literature to inform this statement. Innovative strategies were identified that relate to enhanced public outreach, behavior change approaches, optimization of static public-access defibrillator deployment and housing, evolved automated external defibrillator technology and functionality, improved integration of public-access defibrillation with existing emergency dispatch protocols, and exploration of novel automated external defibrillator delivery vectors. We provide evidence- and consensus-based policy suggestions to enhance public-access defibrillation and guidance for future research in this area.

Shockingly simple? Should you use manual or automated defibrillation in out of hospital cardiac arrest?
Leech C(1), Perkins GD(2).
NO ABSTRACT AVAILABLE

PEDIATRICS AND CHILDREN

Pulseless electrical activity and asystolic cardiac arrest in infants: identifying factors that influence outcomes.
Best K(1), Wyckoff MH(2), Huang R(3), Sandford E(1), Ali N(4).
ABSTRACT
BACKGROUND: There is limited information on pulseless electrical activity (PEA)/asystolic cardiac arrest (CA) in the infant population. The aim is to describe the incidence and factors associated with outcomes in infants with PEA/asystolic CA. METHODS: Single-center retrospective chart review study

of infants less than one year of age who suffer in-hospital PEA/asystolic CA from January 1 2011 to June 30 2019. The primary outcome was the return of spontaneous circulation. The secondary outcome was survival to discharge. RESULTS: CA occurred in 148 infants and PEA/asystolic was found in 38 (26%). Of those 29 (76%) achieved ROSC, and 12 (32%) survived to discharge. Infants on inotrope support or receiving longer duration of chest compressions and epinephrine had increase mortality. All infants with respiratory etiology of arrest survived to hospital discharge. CONCLUSION: PEA/asystolic CAs are uncommon. Poor prognostic indicators include the need for pre-arrest inotrope support and increased duration of chest compressions.

EXTRACORPOREAL LIFE SUPPORT

1. Intern Emerg Med. 2022 Feb 15. doi: 10.1007/s11739-022-02937-7. Online ahead of print.
Radiographic assessment of lung edema (RALE) score is associated with clinical outcomes in patients with refractory cardiogenic shock and refractory cardiac arrest after percutaneous implantation of extracorporeal life support.
Voigt I(1)(2), Mighali M(3), Manda D(3), Aurich P(3)(4), Bruder O(4)(5).
ABSTRACT
VA-ECMO is a promising therapeutic option in refractory cardiogenic shock (RCS) and refractory cardiac arrest (RCA). However, increase in left ventricular afterload enhances further reduction of LV contractility and pulmonary edema. The aim of this study was to evaluate pulmonary edema based on the RALE score and the prognostic value of the score on ECLS weaning and mortality. In this retrospective study, data from 40 patients (16 RCAs and 24 RCSs) were analyzed. Demographic, clinical data and the RALE score for evaluating pulmonary edema were assessed. Descriptive statistics, intraclass correlation, and receiver operating characteristic (ROC) curves were computed. Weaning from ECLS was successful in 30 (75%) patients, 16 patients (40%) were discharged alive. Overall, the survivors were younger, presenting with a higher left ventricular ejection fraction ($30 \pm 2\%$ vs.$23 \pm 9\%$;$p < 0.01$) and a lower initial serum lactate concentration 7.7 ± 4.5 mmol/l vs. 11.5 ± 4.9 mmol/l; $p = 0.017$). Survivors had lower RALE scores than non-survivors (16.3 ± 9.4 vs. 26.4 ± 10.4; $p = 0.0034$). The interobserver variability of the RALE score was good (0.832). The AUC predicting mortality and weaning from ECLS presented comparable results to the established parameters (SAVE, serum lactate). Implementation of the RALE score could support prediction of outcome parameters during VA-ECMO therapy.

2. J Card Surg. 2022 Feb 13. doi: 10.1111/jocs.16307. Online ahead of print.
Contemporary national utilization of extracorporeal cardiopulmonary resuscitation (ECPR) for out-of-hospital cardiac arrest.
Catalano MA(1), Pupovac S(2), Manetta F(2), Kennedy KF(3), Hartman A(2), Yu PJ(2).
ABSTRACT
OBJECTIVE: The utilization of extracorporeal membrane oxygenation (ECMO) during cardio-pulmonary resuscitation (ECPR) has demonstrated promising evidence for the management of out-of-hospital cardiac arrest (OHCA). We aim to describe contemporary utilization and predictors of survival of patients receiving ECPR for OHCA. METHODS: The National Inpatient Sample (NIS) was queried to identify hospital discharge records of patients aged ≥18 years who underwent ECPR from 2012 to 2017. Patients with an International Classification of Diseases, Tenth Revision, Clinical Modification diagnosis of cardiac arrest, admitted urgently and placed on ECMO on Day 0 of hospitalization, were selected. Patients with a primary diagnosis indicative of veno-venous ECMO were excluded. Predictors of mortality were assessed using multivariable analyses. RESULTS: There were 1675 cases of ECPR, increasing from 185 cases in 2012 to 400 in 2017 (p < .001). Overall mortality was 63.3%, which remained stable over time (p = .441). Common diagnoses included ST-

elevation myocardial infarction (39.1%), non-ST-elevation myocardial infarction (9.3%), and pulmonary embolism (13.7%). Percutaneous coronary intervention was performed in 495 patients (29.6%); coronary artery bypass grafting was performed in 125 patients (7.5%). In multivariable analysis, decreased age, female gender, and left ventricular (LV) decompression were associated with reduced mortality. CONCLUSION: Utilization of ECPR is increasing nationally with stable mortality rates. Younger age, female gender, and utilization of LV decompression were associated with increased survival.

EXPERIMENTAL RESEARCH

Omecamtiv mecarbil treatment improves post-resuscitation cardiac function and neurological outcome in a rat model.
Wu SN(1), Tsai MS(1), Huang CH(1), Chen WJ(1)(2).
ABSTRACT
BACKGROUND: Myocardial dysfunction is a major cause of poor outcomes in the post-cardiac arrest period. Omecamtiv mecarbil (OM) is a selective small molecule activator of cardiac myosin that prolongs myocardial systole and increases stroke volume without apparent effects on myocardial oxygen demand. OM administration is safe and improves cardiac function in patients with acute heart failure. Whether OM improves post-resuscitation myocardial dysfunction remains unclear. This study investigated the effect of OM treatment on post-resuscitation myocardial dysfunction and outcomes. METHODS AND RESULTS: Adult male rats were resuscitated after 9.5 min of asphyxia-induced cardiac arrest. OM and normal saline was continuously intravenously infused after return of spontaneous circulation (ROSC) at 0.25 mg/kg/h for 4 h in the experimental group and control group, respectively (n = 20 in each group). Hemodynamic parameters were measured hourly and monitored for 4 h after cardiac arrest. Recovery of neurological function was evaluated by neurological functioning scores (0-12; favorable: 11-12) for rats 72 h after cardiac arrest. OM treatment prolonged left ventricular ejection time and improved post-resuscitation cardiac output. Post-resuscitation heart rate and left ventricular systolic function (dp/dt40) were not different between groups. Kaplan-Meier analysis showed non-statistically higher 72-h survival in the OM group (72.2% [13/18] and 58.8% [10/17], p = 0.386). The OM group had a higher chance of having favorable neurological outcomes in surviving rats 72 h after cardiac arrest (84.6% [11/13] vs. 40% [4/10], p = 0.026). The percentage of damaged neurons was lower in the OM group in a histology study at 72 h after cardiac arrest (55.5±2.3% vs. 76.2±10.2%, p = 0.004). CONCLUSIONS: OM treatment improved post-resuscitation myocardial dysfunction and neurological outcome in an animal model. These findings support further pre-clinical studies to improve outcomes in post-cardiac arrest care.

CASE REPORTS

Full recovery after prolonged resuscitation in a pediatric patient due to fulminant myocarditis: a case report with three-year follow-up.
Gu Y(1), Xue P(2), Chen HL(1), Zou G(1), Ni Y(1), Li L(1), Lu L(1), Chen H(1), Zheng A(1).
ABSTRACT
BACKGROUND: Fulminant myocarditis (FM) is a common life-threatening disease in pediatric patients, which can result in sudden cardiac arrest (CA). Whether prolonged cardiopulmonary resuscitation (CPR) is beneficial to FM induced CA is unknown. CASE PRESENTATION: We reported the case of an 8-year-old child with FM. At 14:49 of the day after admission, the ECG monitoring

indicated ventricular flutter. The patient was immediately given continuous external cardiac compression. Electric cardioversion (energy 30J) and electric defibrillation (energy 50 J, 100 J, 100 J) were given. Continuous chest compression was conducted until extracorporeal membrane oxygenation (ECMO) successfully placed at 19:30 P.M. The total duration of CPR was 291 min. Nine days later, the ECMO was removed; and 29 days later, the patient was discharged from hospital. In the three years of follow-up, the boy showed a full recovery without neurological sequela. At present, his daily activities have returned to normal and his academic performance at school is excellent. CONCLUSIONS: Prolonged CPR can be used in FM induced in-hospital CA in pediatric patients, especially during preparation for ECMO after the failure of standard resuscitation measures.

Lund University Cardiac Arrest System and Percutaneous Coronary Intervention During Cardiac Arrest: Case Report and Review of Literature.
Patel AN(1), Hwang CW(2).
ABSTRACT
We present a case of a 45-year-old female who presented to a community hospital with an anterior ST-elevation myocardial infarction (STEMI) that subsequently developed prolonged ventricular fibrillation (VF) refractory to repeated defibrillation and antiarrhythmic medications. Primary percutaneous coronary intervention was performed in the patient with VF but supported only by the Lund University Cardiac Arrest System (LUCAS). Despite a total VF time of 127 minutes, the patient was eventually discharged neurologically intact with a normal left ventricular function. For the right patient, this case illustrates the utility of the LUCAS device, especially at community hospitals without immediate venoarterial extracorporeal membrane oxygenation or ventricular assist device capability.

Clinician Wire Puncture Injury to the Hand from Chest Compressions on a Patient with a Median Sternotomy: A Case Report.
Vicario-Merino A, Gómez-Robledo ME, Cardós-Alonso C.
ABSTRACT
Standard precautions, including protections from blood and body fluid exposure, are designed to protect health care providers from infections. Sharps safety practices rarely include the potential for the unconscious patient's own body to be a potential source of clinician percutaneous injury from sharp objects outside of the perioperative setting. This case report reviews a percutaneous injury to the hand of a physician who was performing chest compressions on a patient with an out-of-hospital cardiac arrest. The 76-year-old patient in cardiac arrest had undergone a medial sternotomy surgery 15 years before the arrest. The sternal wire rotated owing to the initial chest compressions, breaking the clinician's nitrile glove and producing an open wound on the thenar region of the clinician's right hand. Application of a 10 × 10 12-ply gauze pack on the chest of the patient in cardiac arrest allowed the resuscitation team to continue with the compressions with no further wounds from the wire. This case report is a novel contribution to the published literature and advances standard precautions considerations in patients with out-of-hospital cardiac arrest, with the sternotomy wire from previous surgery as a source of percutaneous clinician injury during chest compression.

Sudden Cardiac Arrest in an Adult with Anomalous Origin of the Left Coronary Artery from the Pulmonary Artery (ALCAPA): Case Report.

Prandi FR(1)(2), Zaidi AN(3), LaRocca G(1), Hadley M(1), Riasat M(4), Anastasius MO(1), Moreno PR(1), Sharma S(1), Kini A(1), Murthy R(5), Boateng P(5), Lerakis S(1).

ABSTRACT

INTRODUCTION: Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is a rare coronary artery anomaly that carries 90% mortality in the first year of life when left untreated. The diagnosis of ALCAPA is rare in adulthood, and it includes a broad spectrum of clinical manifestations, including sudden cardiac death (SCD). CASE REPORT: We report a rare case of resuscitated sudden cardiac arrest in a 55-year-old female, who was diagnosed with ALCAPA and underwent successful surgical correction and implantable cardioverter defibrillator (ICD) implantation for secondary prevention. DISCUSSION: ALCAPA diagnosis is not confined to childhood, and it represents a rare cause of life-threatening arrhythmias and SCD in the adult population. Surgical correction is recommended, regardless of age, presence of symptoms or inducible myocardial ischemia. Multimodality imaging is crucial for diagnosis, management planning and follow up. Assessment of the risk of recurrent ventricular arrhythmias, despite full revascularization, should be performed in all adults with ALCAPA. Myocardial scar detected via late gadolinium enhancement represents a potential irreversible substrate for ventricular arrhythmias, and it provides additional information to evaluate indication of an ICD for secondary prevention.

A case of fulminant myocarditis due to COVID-19 in an adolescent patient successfully treated with venous arterial ECMO as a bridge to recovery.

Buitrago DH(1), Munoz J(2), Finkelstein ER(1)(3), Mulinari L(1).

ABSTRACT

Emerging data suggest an association between severe acute respiratory syndrome coronavirus 2 and the development of acute myocarditis, with children and older adults being most at risk. We describe the clinical course of a previously healthy 12-year-old female who rapidly deteriorated into cardiogenic shock and arrest due to coronavirus disease 2019 induced fulminant myocarditis, necessitating venous-arterial extracorporeal membrane oxygenation as a bridge to full recovery. This case highlights the importance of early clinical recognition of myocardial involvement, and the benefits of taking a multidisciplinary approach in treating these patients.

A 45-year-old man with sudden cardiac death, cutaneous abnormalities and a rare desmoplakin mutation: a case report and literature review.

Santos-Ferreira C(1), Baptista R(2)(3)(4), Teixeira T(3), Gonçalves L(2)(4).

ABSTRACT

BACKGROUND: Arrhythmogenic cardiomyopathy (AC) is a rare, heritable myocardial disorder that is a leading cause of ventricular arrhythmia and sudden cardiac death (SCD) in young people. Desmoplakin (DSP) mutations account for 3-20% of AC cases. However, the number of patients with DSP mutations is extremely small in all published reports and genotype-phenotype correlations are scant and mostly non-gene-specific. CASE PRESENTATION: A 45-year-old man was admitted after an out-of-hospital cardiac arrest, with documented ventricular fibrillation. He had no previous history of heart disease or family history of SCD or cardiomyopathy. The cardiac magnetic resonance showed a mildly dilated left ventricle with an ejection fraction of 30% and a non-dilated right ventricle with mildly depressed systolic function, and extensive subepicardial late gadolinium enhancement. Genetic screening identified a heterozygote nonsense mutation in DSP (NM_004415.2: c.478 C > T;

p.Arg160Ter). Cascade genetic screening of the relatives revealed a high prevalence of the genotype and cutaneous phenotype, but a very low penetrance of the cardiac phenotype. CONCLUSIONS: We report a case of SCD and an autosomal dominant mutation in DSP that causes arrhythmogenic dilated cardiomyopathy/AC. Like the recessive mutation in DSP known to cause Carvajal syndrome, Arg160Ter may be associated with cutaneous abnormalities.

A case of sudden cardiac death due to mitochondrial disease.
Yoshida K(1), Sato H(2), Kimura S(3), Tanaka T(2), Kasai K(2).
ABSTRACT
A 25-year-old, emaciated man without medical treatment was found to have died suddenly at home by his mother. At autopsy, there were no injuries to his body, but significant circulatory insufficiency was observed. Electron microscopy revealed abnormal mitochondria in cells of the cardiac conduction system. The conduction system was filled with mitochondrial size abnormalities and mitochondrial cristae abnormalities. No notable abnormal findings were observed in other organs. Genetic examination of the blood revealed the mitochondrial pathogenetic variant m.3243A>G. Epileptic seizures, diabetic ketoacidosis, and hyperosmolar hyperglycemic state were unlikely to be the cause of sudden death. The cause of death was diagnosed as arrhythmia possibly induced by the failure of the cardiac conduction system due to mitochondrial disease. This is a rare case of sudden death caused by an accumulation of abnormal mitochondria in the cardiac conduction system.