This week's PubMed 18th – 24th September 2022: articles of interest n = 32

CPR AND COVID-19

No articles identified.

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

1. Prehosp Disaster Med. 2022 Sep 23:1-8. doi: 10.1017/S1049023X22001297. Online ahead of print.
Video Emergency Calls in Medical Dispatching: A Scoping Review.
Sýkora R(1)(2)(3), Peřan D(1)(2), Renza M(1)(2), Bradna J(4), Smetana J(2), Duška F(1).
ABSTRACT
BACKGROUND: Video emergency calls (VCs) represent a feasible future trend in medical dispatching. Acceptance among callers and dispatchers seems to be good. Indications, potential problems, limitations, and directions of research of adding a live video from smartphones to an emergency call have not been reviewed outside the context of out-of-hospital cardiac arrest (OHCA). OBJECTIVE: The main objective of this study is to examine the scope and nature of research publications on the topic of VC. The secondary goal is to identify research gaps and discuss the potential directions of research efforts of VC. DESIGN: Following PRISMA-ScR guidelines, online bibliographic databases PubMed, Web of Science, SCOPUS, Google Scholar, ClinicalTrials.gov, and gray literature were searched from the period of January 1, 2012 through March 1, 2022 in English. Only studies focusing on video transfer via mobile phone to emergency medical dispatch centers (EMDCs) were included. RESULTS: Twelve articles were included in the qualitative synthesis and six main themes were identified: (1) cardiopulmonary resuscitation (CPR) guided by VC; (2) indications of VCs; (3) dispatchers' feedback and perception; (4) technical aspects of VCs; (5) callers' acceptance; and (6) confidentiality and legal issues. CONCLUSION: Video emergency calls are feasible and seem to be a well-accepted auxiliary method among dispatchers and callers. Some promising clinical results exist, especially for video-assisted CPR. On the other hand, there are still enormous knowledge gaps in the vast majority of implementation aspects of VC into practice.

2. Circ J. 2022 Sep 22;86(10):1562-1571. doi: 10.1253/circj.CJ-22-0047. Epub 2022 May 14.
Heart Rate and Mortality After Resuscitation in Patients With Out-of-Hospital Cardiac Arrest - Insights From the SOS-KANTO Registry.
Matsumoto S(1), Nakanishi R(1), Ichibayashi R(2), Honda M(2), Hayashida K(3), Sakurai A(4), Kitamura N(5), Tagami T(6), Nakada TA(7), Takeda M(8), Ikeda T(1); SOS-KANTO Study Group.
ABSTRACT
BACKGROUND: Heart rate (HR) predicts outcomes in patients with acute coronary syndrome (ACS), whereas the impact of HR on outcomes after out-of-hospital cardiac arrest (OHCA) remains unclear. This study aimed to investigate the impact of HR after resuscitation on outcomes after OHCA and whether the impact differs with OHCA etiology.Methods and Results: Of 16,452 patients suffering from OHCA, this study analyzed 741 adults for whom HR after resuscitation was recorded by 12-lead electrocardiogram upon hospital arrival. Etiology of OHCA was categorized into 3 groups: ACS, non-

ACS, and non-cardiac. Patients in each etiology group were further divided into tachycardia (>100 beats/min) and non-tachycardia (≤100 beats/min). The impact of HR on outcomes was evaluated in each group. Among the 741 patients, the mean age was 67.6 years and 497 (67.1%) patients were male. The primary outcome - 3-month all-cause mortality - was observed in 55.8% of patients. Tachycardia after resuscitation in patients with ACS was significantly associated with higher all-cause mortality at 3 months (P=0.002), but there was no significant association between tachycardia and mortality in non-ACS and non-cardiac etiology patients. In a multivariate analysis model, the incidence of tachycardia after resuscitation independently predicted higher 3-month all-cause mortality in OHCA patients with ACS (hazard ratio: 2.17 [95% confidence interval: 1.05-4.48], P=0.04). CONCLUSIONS: Increased HR after resuscitation was associated with higher mortality only in patients with ACS.

IN-HOSPITAL CARDIAC ARREST

No articles identified.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. J Am Heart Assoc. 2022 Sep 20;11(18):e026289. doi: 10.1161/JAHA.122.026289. Epub 2022 Sep 14.

Sulfonylurea Is Associated With Higher Risks of Ventricular Arrhythmia or Sudden Cardiac Death Compared With Metformin: A Population-Based Cohort Study.

Lee TTL(1)(2), Hui JMH(2), Lee YHA(2), Satti DI(2), Shum YKL(2), Kiu PTH(2), Wai AKC(1), Liu T(3), Wong WT(4), Chan JSK(2), Cheung BMY(5), Wong ICK(6)(7), Cheng SH(8), Tse G(2)(3)(9).

ABSTRACT

Background Commonly prescribed diabetic medications such as metformin and sulfonylurea may be associated with different arrhythmogenic risks. This study compared the risk of ventricular arrhythmia or sudden cardiac death between metformin and sulfonylurea users in patients with type 2 diabetes. Methods and Results Patients aged ≥40 years who were diagnosed with type 2 diabetes or prescribed antidiabetic agents in Hong Kong between January 1, 2009, and December 31, 2009, were included and followed up until December 31, 2019. Patients prescribed with both metformin and sulfonylurea or had prior myocardial infarction were excluded. The study outcome was a composite of ventricular arrhythmia or sudden cardiac death. Metformin users and sulfonylurea users were matched at a 1:1 ratio by propensity score matching. The matched cohort consisted of 16 596 metformin users (47.70% men; age, 68±11 years; mean follow-up, 4.92±2.55 years) and 16 596 sulfonylurea users (49.80% men; age, 70±11 years; mean follow-up, 4.93±2.55 years). Sulfonylurea was associated with higher risk of ventricular arrhythmia or sudden cardiac death than metformin hazard ratio (HR, 1.90 [95% CI, 1.73-2.08]). Such difference was consistently observed in subgroup analyses stratifying for insulin usage or known coronary heart disease. Conclusions Sulfonylurea use is associated with higher risk of ventricular arrhythmia or sudden cardiac death than metformin in patients with type 2 diabetes.

2. Circ J. 2022 Sep 22;86(10):1490-1498. doi: 10.1253/circj.CJ-21-0999. Epub 2022 Mar 18.

Reduced Left Ventricular Ejection Fraction Is a Risk for Sudden Cardiac Death in the Early Period After Hospital Discharge in Patients With Acute Myocardial Infarction.

Hanada K(1), Sasaki S(1), Seno M(1), Kimura Y(1), Ichikawa H(1), Nishizaki F(1), Yokoyama H(1), Yokota T(2), Okumura K(3), Tomita H(1)(2).

ABSTRACT

BACKGROUND: The incidence of sudden cardiac death (SCD) after discharge in Japanese acute myocardial infarction (AMI) patients with reduced left ventricular ejection fraction (LVEF) treated with primary percutaneous coronary intervention (PCI) remains unknown.Methods and Results:The study population included 1,429 AMI patients (199 with LVEF ≤35% and 1,230 with LVEF >35%) admitted to the Hirosaki University Hospital, treated with primary PCI within 12 h after onset, and survived to discharge. LVEF was evaluated in all patients before discharge, and the patients were followed up for a mean of 2.6±0.8 years. The Kaplan-Meier survival curves revealed LVEF ≤35% was associated with all-cause death and SCD. The incidence of SCD was 2.6% at 1 year and 3.1% at 3 years in patients with LVEF ≤35%, whereas it was 0.1% at 1 year and 0.3% at 3 years in patients with LVEF >35%. Sixty-seven percent of SCDs in patients with LVEF ≤35% occurred within 4 months after discharge, and the events became less frequent after this period. A Cox proportional hazard model indicated LVEF ≤35% as an independent predictor for all-cause death and SCD. CONCLUSIONS: The incidence of SCD was relatively low in Japanese AMI patients treated with primary PCI, even in patients with LVEF ≤35% upon discharge. Careful management of patients with reduced LVEF is required to prevent SCD, especially in the early phase after discharge.

END-TIDAL CO_2

1. Clin Chest Med. 2022 Sep;43(3):393-400. doi: 10.1016/j.ccm.2022.04.002.

Capnography for Monitoring of the Critically Ill Patient.

Nassar BS(1), Schmidt GA(2).

ABSTRACT

Capnography has been widely adopted in multiple clinical areas. The capnogram and end-tidal carbon dioxide offer a wealth of information, in the right clinical setting, and when properly interpreted. In this article, the authors aim to review the most common clinical scenarios during which capnography has been shown to be of benefit. This includes the areas of fluid responsiveness, cardiopulmonary resuscitation, and conscious sedation. They review the published literature, highlighting its pitfalls and identifying its limitations.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

No articles identified.

TRAUMA

No articles identified.

VENTILATION

1. Crit Care. 2022 Sep 23;26(1):287. doi: 10.1186/s13054-022-04156-0.
A novel capnogram analysis to guide ventilation during cardiopulmonary resuscitation: clinical and experimental observations.
Lesimple A(#)(1)(2)(3), Fritz C(#)(4), Hutin A(5)(6), Charbonney E(7)(8), Savary D(2)(9)(10), Delisle S(11), Ouellet P(12), Bronchti G(8), Lidouren F(6)(13), Piraino T(14), Beloncle F(2)(15), Prouvez N(2)(3), Broc A(2)(3), Mercat A(15), Brochard L(16)(17), Tissier R(#)(6)(13), Richard JC(#)(18)(19)(20)(21); CAVIAR (Cardiac Arrest, Ventilation International Association for Research) Group.
ABSTRACT
BACKGROUND: Cardiopulmonary resuscitation (CPR) decreases lung volume below the functional residual capacity and can generate intrathoracic airway closure. Conversely, large insufflations can induce thoracic distension and jeopardize circulation. The capnogram (CO2 signal) obtained during continuous chest compressions can reflect intrathoracic airway closure, and we hypothesized here that it can also indicate thoracic distension. OBJECTIVES: To test whether a specific capnogram may identify thoracic distension during CPR and to assess the impact of thoracic distension on gas exchange and hemodynamics. METHODS: (1) In out-of-hospital cardiac arrest patients, we identified on capnograms three patterns: intrathoracic airway closure, thoracic distension or regular pattern. An algorithm was designed to identify them automatically. (2) To link CO2 patterns with ventilation, we conducted three experiments: (i) reproducing the CO2 patterns in human cadavers, (ii) assessing the influence of tidal volume and respiratory mechanics on thoracic distension using a mechanical lung model and (iii) exploring the impact of thoracic distension patterns on different circulation parameters during CPR on a pig model. MEASUREMENTS AND MAIN RESULTS: (1) Clinical data: 202 capnograms were collected. Intrathoracic airway closure was present in 35%, thoracic distension in 22% and regular pattern in 43%. (2) Experiments: (i) Higher insufflated volumes reproduced thoracic distension CO2 patterns in 5 cadavers. (ii) In the mechanical lung model, thoracic distension patterns were associated with higher volumes and longer time constants. (iii) In six pigs during CPR with various tidal volumes, a CO2 pattern of thoracic distension, but not tidal volume per se, was associated with a significant decrease in blood pressure and cerebral perfusion. CONCLUSIONS: During CPR, capnograms reflecting intrathoracic airway closure, thoracic distension or regular pattern can be identified. In the animal experiment, a thoracic distension pattern on the capnogram is associated with a negative impact of ventilation on blood pressure and cerebral perfusion during CPR, not predicted by tidal volume per se.

2. Clin Exp Emerg Med. 2022 Sep 26. doi: 10.15441/ceem.21.169. Online ahead of print.
Interactive effect of multi-tier response and advanced airway management on clinical outcomes after out-of-hospital cardiac arrest: a nationwide population-based observational study.
Lim HJ(1)(2), Song KJ(2)(3), Shin SD(1)(2), Kim KH(1)(2), Ro YS(1)(2), Yoon H(1)(2).
ABSTRACT
OBJECTIVE: We hypothesized that a multi-tier response (MTR) will provide high-quality cardiopulmonary resuscitation including airway management. However, the type of tier response system and airway management will have different interactive effects resulting in varying outcomes following out-of-hospital cardiac arrest (OHCA). This study aimed to determine whether the advanced airway management method has an effect on OHCA outcomes and to compare the size of the effect across MTR types. METHODS: This is a retrospective population-based observational study

using the Korea OHCA Registry. Airway management methods were categorized into endotracheal intubation (ETI) and supraglottic airway (SGA) groups. The tier system was categorized into single-tier response (STR) or two types of MTR: ambulance-ambulance MTR or fire engine-ambulance MTR. RESULTS: In total, 45,264 patients were analyzed among the 89,087 emergency medical service assessed OHCAs. The SGA group was significantly associated with a lower prehospital return of spontaneous circulation (ROSC) rate compared to the ETI group (adjusted odds ratio [aOR], 0.79; 95% confidence interval [CI], 0.72-0.88). Both MTR with an ambulance or fire engine were significantly associated with higher prehospital ROSC rates compared to STR (STR vs. MTR with an ambulance: aOR, 1.33; 95% CI, 1.21-1.47; STR vs. MTR with a fire engine: aOR, 1.43; 95% CI, 1.20-1.71). Prehospital SGA was significantly associated with poor neurological outcomes in MTR with fire engine (aOR, 0.71; 95% CI, 0.53-0.96). CONCLUSION: In this nationwide observational study, we observed that MTR was associated with higher prehospital ROSC than STR. Moreover, SGA is associated with a lower prehospital ROSC rate regardless of tier response type compared to ETI.

CERERBRAL MONITORING

1. Medicina (Kaunas). 2022 Sep 6;58(9):1233. doi: 10.3390/medicina58091233.
The Prognostic Value of Optic Nerve Sheath Diameter/Eyeball Transverse Diameter Ratio in the Neurological Outcomes of Out-of-Hospital Cardiac Arrest Patients.
Cho BI(1), Lee H(1), Shin H(1), Kim C(1), Choi HJ(1), Kang BS(1).
ABSTRACT
Background and objectives: The optic nerve sheath diameter (ONSD) is indicative of elevated intracranial pressure. However, the usefulness of the ONSD for predicting neurologic outcomes in cardiac arrest survivals has been debatable. Reportedly, the ONSD/eyeball transverse diameter (ETD) ratio is a more reliable marker for identifying intracranial pressure than sole use of ONSD. Materials and Methods: This retrospective study aimed to investigate the prognostic value of the ONSD/ETD ratio in out-of-hospital cardiac arrest (OHCA) patients. We studied the brain computed tomography scans of adult OHCA patients with return of spontaneous circulation, who visited a single hospital connected with a Korean university between January 2015 and September 2020. We collected baseline characteristics and patient information from electronic medical records and ONSD and ETD were measured by two physicians with a pre-defined protocol. According to their neurologic outcome upon hospital discharge, patients were divided into good neurologic outcome (GNO; cerebral performance category [CPC] 1-2) and poor neurologic outcome (PNO; CPC 3-5) groups. We evaluated the ONSD/ETD ratio between the GNO and PNO groups to establish its prognostic value for neurologic outcomes. Results: Of the 100 included patients, 28 had GNO. Both the ONSD and ETD were not significantly different between the two groups (ONSD, 5.48 mm vs. 5.66 mm, p = 0.054; ETD, 22.98 mm vs. 22.61 mm, p = 0.204). However, the ONSD/ETD ratio was significantly higher in the PNO group in the univariate analysis (0.239 vs. 0.255, p = 0.014). The area under the receiver operating characteristic curve of ONSD/ETD ratio for predicting PNO was 0.66 (95% confidence interval, 0.56-0.75; p = 0.006). There was no independent relationship between the ONSD/ETD ratio and PNO in multivariate analysis (aOR = 0.000; p = 0.173). Conclusions: The ONSD/ETD ratio was more reliable than sole use of ONSD and might be used to predict neurologic outcomes in OHCA survivors.

2. World J Emerg Med. 2022;13(5):349-354. doi: 10.5847/wjem.j.1920-8642.2022.080.
Timing of brain computed tomography for predicting neurological prognosis in comatose cardiac arrest survivors: a retrospective observational study.
Wang GN(1), Zhang ZM(1), Chen W(2), Xu XQ(2), Zhang JS(1).
ABSTRACT

BACKGROUND: To assess the association between relevant brain computed tomography (CT) parameters at different time and neurological prognosis in adult comatose survivors after cardiac arrest (CA). METHODS: A total of 94 CA patients who underwent early and late CT scans (within 24 h and 24 h to 7 d respectively after CA) between January 2018 and April 2020 were enrolled in this retrospective study. According to the Cerebral Performance Category (CPC) score at hospital discharge, the patients were divided into either a good outcome (CPC 1-2) group or a poor-outcome group (CPC 3-5). The grey-to-white matter ratio (GWR) and the proportion of cerebrospinal fluid volume (pCSFV) were measured. In predicting poor outcomes, the prognostic performance of relevant CT parameters was evaluated, and the comparison analysis (expressed as the ratio of parameters in late CT to those in the early CT) of different CT time was conducted. RESULTS: Totally 26 patients were in the good-outcome group, while 68 patients were in the poor-outcome group. The putamen density, GWR, and pCSFV in late CT were significantly lower in the poor-outcome group ($P<0.05$). The ratios of GWR and pCSFV in the poor-outcome group were significantly decreased according to comparison analysis of different CT time ($P<0.05$), while there was no significant difference in the ratio of putamen density. GWR-basal ganglia <1.18 in late CT showed the best predictive value. The ratio of pCSFV <0.98 predicted unfavorable neurological outcomes with a sensitivity of 65.9% and a specificity of 93.8% ($P=0.001$). CONCLUSIONS: Brain CT performed >24 h after CA may be a good choice as a neuroimaging approach to evaluating prognosis. To predict neurological prognosis, comparison analysis of different CT time can be used as another promising tool in comatose CA survivors.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. J Clin Med. 2022 Sep 14;11(18):5390. doi: 10.3390/jcm11185390.

Application of the Team Emergency Assessment Measure for Prehospital Cardiopulmonary Resuscitation.

Han S(1), Park HJ(2), Jeong WJ(3), Kim GW(1), Choi HJ(4), Moon HJ(5), Lee K(6), Choi HJ(7), Park YJ(8), Cho JS(9), Lee CA(2).

ABSTRACT

INTRODUCTION: Communication and teamwork are critical for ensuring patient safety, particularly during prehospital cardiopulmonary resuscitation (CPR). The Team Emergency Assessment Measure (TEAM) is a tool applicable to such situations. This study aimed to validate the TEAM efficiency as a suitable tool even in prehospital CPR. METHODS: A multi-centric observational study was conducted using the data of all non-traumatic out-of-hospital cardiac arrest patients aged over 18 years who were treated using video communication-based medical direction in 2018. From the extracted data of 1494 eligible patients, 67 sample cases were randomly selected. Two experienced raters were assigned to each case. Each rater reviewed 13 or 14 videos and scored the TEAM items for each field cardiopulmonary resuscitation performance. The internal consistency, concurrent validity, and inter-rater reliability were measured. RESULTS: The TEAM showed high reliability with a Cronbach's alpha value of 0.939, with a mean interitem correlation of 0.584. The mean item-total correlation was 0.789, indicating significant associations. The mean correlation coefficient between each item and the global score range was 0.682, indicating good concurrent validity. The mean intra-class correlation coefficient was 0.804, indicating excellent agreement. DISCUSSION: The TEAM can be a valid and reliable tool to evaluate the non-technical skills of a team of paramedics performing CPR.

2. Am J Emerg Med. 2022 Sep 6;61:158-162. doi: 10.1016/j.ajem.2022.08.059. Online ahead of print.
Development of a model to measure the effect of off-balancing vectors on the delivery of high-quality CPR in a moving vehicle.
Manoukian MAC(1), Rose JS(2), Brown SK(2), Wynia EH(2), Julie IM(2), Mumma BE(2).
ABSTRACT
AIM: We sought to develop a model to measure the acceleration and jerk vectors affecting the performance of High-Quality Cardiopulmonary Resuscitation (HQ-CPR) during patient transport. METHODS: Three participants completed a total of eighteen rounds of compression only HQ-CPR in a moving vehicle. The vehicle was driven in a manner that either minimized or increased linear and angular vectors. The HQ-CPR variables measured were compression fraction (CF%), and percentages of compressions with correct depth > 5 cm (D%), rate 100-120 (R%), full recoil (FR%), and hand position (HP%). A composite HQ-CPR score was calculated: ((D% + R% + FR% + HP%)/4) * CF%). Linear and gyroscopic data were measured in the X, Y, and Z axes. The perceived difficulty in performing HQ-CPR was measured with the Borg Rating of Perceived Exertion Scale. RESULTS: HQ-CPR data, linear vector data, and gyroscopic data were successfully recorded in all trial evolutions. Univariate regression analysis demonstrated that HQ-CPR was negatively affected by increasing magnitudes of linear acceleration (B = -0.093%/m/s2, 95% CI [-0.17 - -0.02), p = 0.02], linear jerk (B = -0.134%/m/s3, 95% CI [-0.26 - -0.01], p = 0.04), angular velocity (B = -0.543%/radian/s, 95% CI [-0.98 - -0.11], p = 0.02), and angular acceleration (B = 0.863%/radian/s2, 95% CI [-1.69 - -0.03], p = 0.04). Increasing vectors were negatively associated with FR% and R%. No difference was seen in D%, HP%, or CF%. Borg Rating of Perceived Exertion was greater in dynamic driving evolutions (8 ± 1 vs 3.5 ± 1.53, p = 0.02). CONCLUSION: This model reliably measured linear and angular off-balancing vectors experienced during the delivery of HQ-CPR in a moving vehicle. In this preliminary report, compression rate and full recoil appear to be HQ-CPR variables most affected in a moving vehicle.

3. Medicine (Baltimore). 2022 Sep 16;101(37):e30438. doi: 10.1097/MD.0000000000030438.
Effect of real-time feedback on patient's outcomes and survival after cardiac arrest: A systematic review and meta-analysis.
Lv GW(1), Hu QC(1), Zhang M(1), Feng SY(1), Li Y(1), Zhang Y(2), Zhang YY(3), Wang WJ(1).
ABSTRACT
PURPOSE: This study investigated the effect of real-time feedback on the restoration of spontaneous circulation, survival to hospital discharge, and favorable functional outcomes after hospital discharge. METHODS: PubMed, ScienceDirect, and China National Knowledge Infrastructure databases were searched to screen the relevant studies up to June 2020. Fixed-effects or random-effects model were used to calculate the pooled estimates of relative ratios (RRs) with 95% confidence intervals (CIs). RESULTS: Ten relevant articles on 4281 cardiac arrest cases were identified. The pooled analyses indicated that real-time feedback did not improve restoration of spontaneous circulation (RR: 1.13, 95% CI: 0.92-1.37, and P = .24; I2 = 81%; P < .001), survival to hospital discharge (RR: 1.27, 95% CI: 0.90-1.79, and P = .18; I2 = 74%; P < .001), and favorable neurological outcomes after hospital discharge (RR: 1.09, 95% CI: 0.87-1.38; P = .45; I2 = 16%; P = .31). The predefined subgroup analysis showed that the sample size and arrest location may be the origin of heterogeneity. Begg's and Egger's tests showed no publication bias, and sensitivity analysis indicated that the results were stable. CONCLUSION: The meta-analysis had shown that the implementation of real-time audiovisual feedback was not associated with improved restoration of spontaneous circulation, increased survival, and favorable functional outcomes after hospital discharge.

4. Children (Basel). 2022 Sep 10;9(9):1373. doi: 10.3390/children9091373.
The Effects of an Intervention Based on the Flipped Classroom on the Learning of Basic Life Support in Schoolchildren Aged 10-13 Years: A Quasi-Experimental Study.
Cons-Ferreiro M(1)(2), Mecías-Calvo M(2), Romo-Pérez V(1), Navarro-Patón R(2).
ABSTRACT
Most out-of-hospital cardiac arrests are attended first by bystanders who are usually friends and/or relatives of the victim. Therefore, the objective of this research was to analyse the impact of a training process based on the flipped classroom on basic life support skills in primary education students. The sample consisted of 308 children (148 experimental group (EG) and 160 control group (CG)) between 10 and 13 years old (M = 10.68 ± 0.64) from 2 schools in Galicia, Spain. The data reveal that the quality parameters are obtained in the number of total compressions in 2 min (CG = 213 and EG = 217; p = 0.024) and in the percentage of correct compressions (CG = 87.23% and EG = 91.6%; p = 0.013) except for the mean depth and the percentage of correct compressions, which were not reached in any case. Regarding the application of an effective discharge with the Automated external defibrillator (AED), there were no significant differences in the time used by schoolchildren between both methods (p = 0.795), but 97.5% (n = 156) of the CG and 100% (n = 148) of the EG are able to do it in just over 1 min. Based on the results obtained, we can conclude that a training program based on the flipped classroom is as effective and viable as traditional training in psychomotricity on CPR techniques and the application of an effective discharge using an AED.

POST-CARDIAC ARREST TREATMENTS

1. Neurocrit Care. 2022 Sep 19. doi: 10.1007/s12028-022-01601-4. Online ahead of print.
Short-Acting Neuromuscular Blockade Improves Inter-rater Reliability of Median Somatosensory Evoked Potentials in Post-cardiac arrest Prognostication.
Oishi T(1), Triplett JD(2)(3), Laughlin RS(2), Hocker SE(2), Berini SE(2), Hoffman EM(2).
ABSTRACT
BACKGROUND: Although median nerve somatosensory evoked potentials are routinely used for prognostication in comatose cardiac arrest survivors, myogenic artifact can reduce inter-rater reliability, leading to unreliable or inaccurate results. To minimize this risk, we determined the benefit of neuromuscular blockade agents in improving the inter-rater reliability and signal-to-noise ratio of SSEPs in the context of prognostication. METHODS: Thirty comatose survivors of cardiac arrest were enrolled in the study, following the request from an intensivist to complete an SSEP for prognostication. Right and left median nerve SSEPs were obtained from each patient, before and after administration of an NMB agent. Clinical histories and outcomes were retrospectively reviewed. The SSEP recordings before and after NMB were randomized and reviewed by five blinded raters, who assessed the latency and amplitude of cortical and noncortical potentials (vs. absence of response) as well as the diagnostic quality of cortical recordings. The inter-rater reliability of SSEP interpretation before and after NMB was compared via Fleiss' κ score. RESULTS: Following NMB administration, Fleiss' κ score for cortical SSEP interpretation significantly improved from 0.37 to 0.60, corresponding to greater agreement among raters. The raters were also less likely to report the cortical recordings as nondiagnostic following NMB (40.7% nondiagnostic SSEPs pre-NMB; 17% post-NMB). The SNR significantly improved following NMB, especially when the pre-NMB SNR was low (< 10 dB). Across the raters, there were three patients whose SSEP interpretation changed from bilaterally absent to bilaterally present after NMB was administered (potential false positives without NMB). CONCLUSIONS: NMB significantly improves the inter-rater reliability and SNR of median SSEPs for prognostication among comatose cardiac arrest survivors. To ensure the most reliable prognostic information in comatose post-cardiac arrest survivors, pharmacologic paralysis should be consistently used before recording SSEPs.

2. Crit Care Med. 2022 Oct 1;50(10):1494-1502. doi: 10.1097/CCM.0000000000005594. Epub 2022 Jun 8.

Accuracy of the Initial Rhythm to Predict a Short No-Flow Time in Out-of-Hospital Cardiac Arrest.

Cournoyer A(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18), Cavayas YA(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18), Potter B(6)(9)(10), Lamarche Y(2), Segal E(5)(16)(17), de Montigny L(5), Albert M(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12) (13)(14)(15)(16)(17)(18), Lessard J(1)(3), Marquis M(2), Paquet J(2), Cossette S(13)(18), Morris J(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18), Castonguay V(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18), Chauny JM(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18), Daoust R(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16)(17)(18).

ABSTRACT

OBJECTIVES: The no-flow time (NFT) can help establish prognosis in out-of-hospital cardiac arrest (OHCA) patients. It is often used as a selection criterion for extracorporeal resuscitation. In patients with an unwitnessed OHCA for whom the NFT is unknown, the initial rhythm has been proposed to identify those more likely to have had a short NFT. Our objective was to determine the predictive accuracy of an initial shockable rhythm for an NFT of 5 minutes or less (NFT ≤ 5). DESIGN: Retrospective analysis of prospectively collected data. SETTING: Prehospital OHCA in eight U.S. and three Canadian sites. PATIENTS: A total of 28,139 adult patients with a witnessed nontraumatic OHCA were included, of whom 11,228 (39.9%) experienced an emergency medical service-witnessed OHCA (NFT = 0), 695 (2.7%) had a bystander-witnessed OHCA, and an NFT less than or equal to 5, and 16,216 (57.6%) with a bystander-witnessed OHCA and an NFT greater than 5. INTERVENTIONS: Sensitivity, specificity, and likelihood ratios of an initial shockable rhythm to identify patients with an NFT less than or equal to 5 minutes. MEASUREMENTS AND MAIN RESULTS: The sensitivity of an initial shockable rhythm to identify patients with an NFT less than or equal to 5 was poor (25% [95% CI, 25-26]), but specificity was moderate (70% [95% CI, 69-71]). The positive and likelihood ratios were inverted (negative accuracy) (positive likelihood ratio, 0.76 [95% CI, 0.74-0.79]; negative likelihood ratio, 1.12 [95% CI, 1.10-1.12]). Including only patients with a bystander-witnessed OHCA improved the sensitivity to 48% (95% CI, 45-52), the positive likelihood ratio to 1.45 (95% CI, 1.33-1.58), and the negative likelihood ratio to 0.77 (95% CI, 0.72-0.83), while slightly lowering the specificity to 67% (95% CI, 66-67). CONCLUSIONS: Our analysis demonstrated that the presence of a shockable rhythm at the time of initial assessment was poorly sensitive and only moderately specific for OHCA patients with a short NFT. The initial rhythm, therefore, should not be used as a surrogate for NFT in clinical decision-making.

TARGETED TEMPERATURE MANAGEMENT

1. Cureus. 2022 Sep 11;14(9):e29016. doi: 10.7759/cureus.29016. eCollection 2022 Sep.

Targeted Temperature Management After Cardiac Arrest: A Systematic Review.

Bisht A(1)(2), Gopinath A(3)(2), Cheema AH(2), Chaludiya K(2), Khalid M(2), Nwosu M(2), Agyeman WY(4), Arcia Franchini AP(5).

ABSTRACT

Targeted temperature management (TTM) has been the cornerstone of post-cardiac arrest care, but even after therapy, neurological outcomes remain poor. We performed a systematic review to evaluate the influence of TTM in post-cardiac arrest treatment, its effect on the neurological outcome, survival, and the adverse events associated with it. We also aimed to examine any difference between the effect of therapy at various intensities and durations on the prognosis of the patient. A search of two databases was done to find relevant studies, followed by a thorough screening in which the inclusion and exclusion criteria were applied, and a quality appraisal of clinical trials was done. In this systematic review, six randomized clinical trials with a total of 3870

participants were examined. Of these, 2,767 participants were treated with targeted hypothermia to varying degrees (between 31 and 36 degrees Celsius), 931 participants were treated with targeted normothermia (36.5 to 37.5 degrees Celsius), and 172 participants were treated with only normothermia (without any active cooling or interventions). It was concluded that TTM at a lower temperature did not have any benefit regarding the neurological outcome and mortality over targeted normothermia but was superior to no temperature management. TTM was also found to have significantly more negative effects when the intensity or duration was increased.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

1. JACC Clin Electrophysiol. 2022 Sep;8(9):1165-1172. doi: 10.1016/j.jacep.2022.07.020.
The Case for Home AED in Children, Adolescents, and Young Adults Not Meeting Criteria for ICD.
Balaji S(1), Atkins DL(2), Berger S(3), Etheridge SP(4), Shah MJ(5); Pediatric and Congenital Electrophysiology Society (PACES).

ABSTRACT
Children, adolescents, and young adults with conditions such as cardiomyopathies and channelopathies are at higher risk of sudden cardiac death caused by lethal arrhythmias, especially ventricular fibrillation. Timely defibrillation saves lives. Patients thought to be at significantly high risk of sudden death typically undergo placement of an implantable cardioverter-defibrillator. Patients thought to be at lower risk are typically followed medically but do not undergo implantable cardioverter-defibrillator placement. However, low risk does not equal no risk. Compared with the general population, many of these patients are at significantly higher risk for lethal arrhythmias. We make the case that such individuals and families will benefit from having an at-home automatic external defibrillator. Used in conjunction with conventional measures such as training on cardiopulmonary resuscitation, an at-home automatic external defibrillator could lead to significantly shortened time to defibrillation with better overall and neurological survival. We recommend that the cost of such home automatic external defibrillators should be covered by medical insurance.

2. IEEE Trans Biomed Eng. 2022 Oct;69(10):3109-3118. doi: 10.1109/TBME.2022.3161725. Epub 2022 Sep 19.
QT Interval Adaptation to Heart Rate Changes in Atrial Fibrillation as a Predictor of Sudden Cardiac Death.
Martin-Yebra A, Sornmo L, Laguna P.

ABSTRACT
OBJECTIVE: The clinical significance of QT interval adaptation to heart rate changes has been poorly investigated in atrial fibrillation (AF), since QT delineation in the presence of f-waves is challenging. The objective of the present study is to investigate new techniques for QT adaptation estimation in permanent AF. METHODS: A multilead strategy based on periodic component analysis, to emphasize T-wave periodicity, is proposed for QT delineation. QT adaptation is modeled by a linear, time-invariant filter, which describes the dependence between the current QT interval and the preceding RR intervals, followed by a memoryless, nonlinear, function. The QT adaptation time lag is determined from the estimated impulse response. RESULTS: Using simulated ECGs in permanent AF, the transformed lead was found to offer more accurate QT delineation and time lag estimation than did the original ECG leads for a wide range of f-wave amplitudes. In a population with chronic heart failure and permanent AF, the time lag estimated from the transformed lead was found to have the strongest, statistically significant association with sudden cardiac death (SCD) (hazard ratio = 3.49). CONCLUSIONS: Periodic component analysis provides more accurate QT delineation and improves

time lag estimation in AF. A prolonged QT adaptation time lag is associated with a high risk for SCD. SIGNIFICANCE: SCD risk markers originally developed for sinus rhythm can also be used in AF, provided that T-wave periodicity is emphasized. The time lag is a potentially useful biomarker for identifying patients at risk for SCD, guiding clinicians in adopting effective therapeutic decisions.

PEDIATRICS AND CHILDREN

1. Am J Emerg Med. 2022 Sep 14;61:163-168. doi: 10.1016/j.ajem.2022.09.012. Online ahead of print.

Comparison of two infant cardiopulmonary resuscitation techniques explained by phone in a non-health professionals' population: Two-thumbs encircling hand technique vs. two-fingers technique, a randomised crossover study in a simulation environment.

Tellier É(1), Lacaze M(2), Naud J(3), Sanchez O(4), Vally R(4), Bérard C(4), Revel P(1), Galinski M(1), Gil-Jardiné C(5).

ABSTRACT

BACKGROUND: Paediatric out-of-hospital cardiac arrest (OHCA) is the reason for an emergency call in approximately 8/100,000 person-years. Improvement of OHCA resuscitation needs a quality chain of survival and a rapid start of resuscitation. The aim of this study was to compare the efficacy of two resuscitation techniques provided on a mannequin, the two-fingers technique (TFT) and the two-thumbs encircling hand technique (TTHT), explained by a trained emergency call responder on the phone in a population of non-health professionals. METHODS: We conducted a randomised crossover study in the simulation lab of a University Hospital. The participants included in the study were non-health professional volunteers of legal age. The participants were assigned (1:1 ratio) to two groups: group A: TFT then TTHT, group B: TTHT then TFT. Scenario and techniques were discovered during the evaluation. RESULTS: Thirty-five volunteers were randomised before the sessions and 33 ultimately came to the simulation lab. We found a better median QCPR global score during TTHT sessions than during TFT sessions (74 vs. 59, P = 0.046). Linear mixed models showed that the TTHT method was the only variable associated with a better QCPR global score [model 1: β = 14.3; 95% confidence interval (CI), 2.4-26.2; model 2: β = 14.5; 95% CI, 2.5-26.6]. CONCLUSION: Our study showed the superiority of TTHT for infant CPR performed by non-health professionals when an emergency call responder advised them over the phone. It seemed to be the best technique for a solo rescuer regardless of previous training.

EXTRACORPOREAL LIFE SUPPORT

1. Interact Cardiovasc Thorac Surg. 2022 Sep 9;35(4):ivac219. doi: 10.1093/icvts/ivac219.

Systematic review and meta-analysis comparing low-flow duration of extracorporeal and conventional cardiopulmonary resuscitation.

Mandigers L(1)(2), Boersma E(3), den Uil CA(1)(3)(4), Gommers D(1), Bělohlávek J(5), Belliato M(6), Lorusso R(7), Dos Reis Miranda D(1).

ABSTRACT

OBJECTIVES: After cardiac arrest, a key factor determining survival outcomes is low-flow duration. Our aims were to determine the relation of survival and low-flow duration of extracorporeal cardiopulmonary resuscitation (ECPR) and conventional cardiopulmonary resuscitation (CCPR) and if these 2 therapies have different short-term survival curves in relation to low-flow duration. METHODS: We searched Embase, Medline, Web of Science and Google Scholar from inception up to April 2021. A linear mixed-effect model was used to describe the course of survival over time, based on study-specific and time-specific aggregated survival data. RESULTS: We included 42 observational

studies reporting on 1689 ECPR and 375 751 CCPR procedures. Of the included studies, 25 included adults, 13 included children and 4 included both. In adults, survival curves decline rapidly over time (ECPR 37.2%, 29.8%, 23.8% and 19.1% versus CCPR-shockable 36.8%, 7.2%, 1.4% and 0.3% for 15, 30, 45 and 60 min low-flow, respectively). ECPR was associated with a statistically significant slower decline in survival than CCPR with initial shockable rhythms (CCPR-shockable). In children, survival curves decline rapidly over time (ECPR 43.6%, 41.7%, 39.8% and 38.0% versus CCPR-shockable 48.6%, 20.5%, 8.6% and 3.6% for 15, 30, 45 and 60 min low-flow, respectively). ECPR was associated with a statistically significant slower decline in survival than CCPR-shockable. CONCLUSIONS: The short-term survival of ECPR and CCPR-shockable patients both decline rapidly over time, in adults as well as in children. This decline of short-term survival in relation to low-flow duration in ECPR was slower than in conventional cardiopulmonary resuscitation.

2. Medicine (Baltimore). 2022 Sep 16;101(37):e30568. doi: 10.1097/MD.0000000000030568.
Satisfactory outcome with activated clotting time <160 seconds in extracorporeal cardiopulmonary resuscitation.
Kim BK(1), Hong JI(2), Hwang J(2), Shin HJ(2).
ABSTRACT
Patients undergoing cardiopulmonary resuscitation (CPR) prior to extracorporeal membrane oxygenation (ECMO) can have severely altered physiology, including that of the coagulation pathway. This could complicate the extracorporeal cardiopulmonary resuscitation (ECPR) management. We aimed to show that targeting an activated clotting time (ACT) < 160 seconds does not affect the complication rates in these patients. In this single-centered retrospective study, the medical records of 81 adult patients who were on ECMO support from March 2017 to March 2020 were reviewed. We compared the low ACT and conventional ACT groups, which were defined on the basis of the median of the ACT values of the included patients (160 seconds). The primary outcomes included bleeding or thromboembolic events. This study included 32 patients, who were divided into the low (n = 14) and conventional (n = 18) ACT groups. There were 2 cases of gastrointestinal bleeding (P = .183), one of intracranial hemorrhage (P = .437), and one of peripheral skin color change (P = .437) in the low ACT group. There was one case of prolonged bleeding at the cannulation site (P = 1.000) reported in the conventional ACT group. The successful weaning rate differed significantly between the low and conventional ACT groups (92.9% vs 50.0%; P = .019). Maintaining the ACT lower than the conventional ACT in patients requiring ECPR did not show a significant increase in the thromboembolic risk. Therefore, targeting a low ACT should be considered for this particular group of patients.

EXPERIMENTAL RESEARCH

1. Front Physiol. 2022 Sep 5;13:960652. doi: 10.3389/fphys.2022.960652. eCollection 2022.
Functional recovery after accidental deep hypothermic cardiac arrest: Comparison of different cardiopulmonary bypass rewarming strategies.
Filseth OM(1)(2)(3), Kondratiev T(1), Sieck GC(4), Tveita T(1)(2)(4).
ABSTRACT
Introduction: Using a porcine model of accidental immersion hypothermia and hypothermic cardiac arrest (HCA), the aim of the present study was to compare effects of different rewarming strategies on CPB on need for vascular fluid supply, level of cardiac restitution, and cerebral metabolism and pressures. Materials and Methods: Totally sixteen healthy, anesthetized castrated male pigs were immersion cooled to 20°C to induce HCA, maintained for 75 min and then randomized into two groups: 1) animals receiving CPB rewarming to 30°C followed by immersion rewarming to 36°C (CPB30, n = 8), or 2) animals receiving CPB rewarming to 36°C (CPB36, n = 8). Measurements of cerebral metabolism were collected using a microdialysis catheter. After rewarming to 36°C,

surviving animals in both groups were further warmed by immersion to 38°C and observed for 2 h. Results: Survival rate at 2 h after rewarming was 5 out of 8 animals in the CPB30 group, and 8 out of 8 in the CPB36 group. All surviving animals displayed significant acute cardiac dysfunction irrespective of rewarming method. Differences between groups in CPB exposure time or rewarming rate created no differences in need for vascular volume supply, in variables of cerebral metabolism, or in cerebral pressures and blood flow. Conclusion: As 3 out of 8 animals did not survive weaning from CPB at 30°C, early weaning gave no advantages over weaning at 36°C. Further, in surviving animals, the results showed no differences between groups in the need for vascular volume replacement, nor any differences in cerebral blood flow or pressures. Most prominent, after weaning from CPB, was the existence of acute cardiac failure which was responsible for the inability to create an adequate perfusion irrespective of rewarming strategy.

CASE REPORTS

1. Ann Emerg Med. 2022 Oct;80(4):e61-e62. doi: 10.1016/j.annemergmed.2022.04.016.
Elderly Male With Out-of-Hospital Cardiac Arrest.
Su YC(1), Sim SS(1), Chiu YC(1), Chu SE(1), Hsieh MJ(2), Huang EP(2), Tsai KC(1), Chiang WC(3), Ma MH(3), Sun JT(4).
NO ABSTRACT AVAILABLE

2. A A Pract. 2022 Sep 23;16(9):e01616. doi: 10.1213/XAA.0000000000001616. eCollection 2022 Sep 1.
Cardiac Arrest Following Remimazolam-Induced Anaphylaxis: A Case Report.
Hasushita Y(1), Nagao M(2), Miyazawa Y(1), Yunoki K(1), Mima H(1).
ABSTRACT
Remimazolam is a recently approved benzodiazepine sedative. We report a case of a 72-year-old man who experienced a cardiac arrest due to severe anaphylaxis immediately after general anesthesia induction. Based on the results of skin tests, including those for dextran 40, an excipient in the remimazolam solution, and a review of drugs given during 3 anesthetics, remimazolam was identified as the probable causative agent. Although remimazolam is structurally similar to midazolam, the patient was not allergic to midazolam as demonstrated before and after anaphylaxis. This report highlights the potential risk of allergic reactions to remimazolam.

3. Children (Basel). 2022 Sep 13;9(9):1379. doi: 10.3390/children9091379.
Fatal Hypernatremic Dehydration in a Term Exclusively Breastfed Newborn.
Del Castillo-Hegyi C(1)(2), Achilles J(2)(3), Segrave-Daly BJ(2), Hafken L(2)(4).
ABSTRACT
Hypernatremic dehydration in term newborns has steadily increased in incidence with increasing efforts to promote exclusive breastfeeding before hospital discharge, a key metric of the Baby-Friendly Hospital Initiative. The following report details a case of a term newborn infant who had evidence of poor intake while exclusively breastfeeding during his hospital stay that may not have been recognized by health care providers. The infant was discharged home and was subsequently found by the parents in cardiac arrest 12 h after discharge and was found to have hypernatremic dehydration. Although return of spontaneous circulation was achieved after fluid resuscitation, the infant sustained extensive hypoxic-ischemic brain injury due to cardiovascular collapse. Due to the infant's extremely poor prognosis, life support was withdrawn at 19 days of age and the infant expired. This sentinel case demonstrates multiple pitfalls of current perceptions of normal vs. abnormal newborn feeding behavior, weight loss percentages, elimination patterns, and acceptable

clinical thresholds believed to be safe for neonates. Newer data have shown that hypernatremia occurs commonly in healthy, term breastfed newborns at weight loss percentages previously deemed normal by most health professionals and hospital protocols. In-hospital strategies to prevent excessive weight loss and screening for hypernatremia in response to signs of inadequate feeding have the potential to prevent tens of thousands of readmissions for feeding complications a year, as well as hundreds of millions in health care costs.

4. BMC Neurol. 2022 Sep 22;22(1):365. doi: 10.1186/s12883-022-02880-2.
Continuous monitoring of brain perfusion by cerebral oximetry after spontaneous return of circulation in cardiac arrest: a case report.
Zhou H(#)(1), Lin C(#)(1), Liu J(1), Wang X(2).
ABSTRACT
BACKGROUND: Cerebral resuscitation determines the prognosis for patients who have experienced sudden death, and brain protection is the focus of clinical treatment. Cerebral resuscitation depends on the timing and quality of cardiopulmonary resuscitation (CPR). At present, cerebral oxygen monitoring is used mainly to monitor the quality of external cardiac compression and provide a prognosis for the nervous system. However, after the return of autonomous circulation, it is necessary to conduct continuous monitoring to ensure measures are taken timeously since hemodynamic instability, brain edema, and other factors may cause occult brain injury, and invasive arterial pressure cannot represent cerebral perfusion. CASE PRESENTATION: By using continuous cerebral oxygen monitoring after CPR and the return of spontaneous circulation, a patient who was witnessed to have experienced sudden death in the hospital was found to have insufficient cerebral perfusion; he underwent timely intra-aortic balloon counterpulsation to improve his hemodynamics and cerebral perfusion. The patient went on to achieve a good neurological prognosis. CONCLUSION: Cerebral oxygen monitoring should be conducted throughout the treatment period; physicians should understand cerebral perfusion in real time and implement timely intervention measures to reduce occult brain injury and improve the neurological prognosis of patients.

5. Cardiol Young. 2022 Sep 22:1-3. doi: 10.1017/S1047951122002967. Online ahead of print.
A rare coronary artery anomaly in a 14-year-old boy with sudden cardiac arrest.
Ruffing S(1), Abdul-Khaliq H(2), Poryo M(3).
ABSTRACT
Congenital coronary artery anomalies represent a rare cause for cardiac arrest in children and adults; however, most of these anomalies are asymptomatic and incidental findings. We report on a 14-year-old boy who was admitted to our hospital after cardiopulmonary resuscitation at home. Diagnostic workup including histopathology revealed parvovirus B19 in endomyocardial biopsy. Moreover, cardiac catheterisation as well as CT angiography identified an anomalous origin of the right coronary artery with an interarterial course. Since this anomalous coronary artery might have caused impaired myocardial perfusion causing cardiac arrest, surgical correction and implantation of a cardioverter defibrillator were performed. The further post-operative clinical course (7 months) has been uneventful.

6. JACC Case Rep. 2022 Sep 7;4(17):1070-1073. doi: 10.1016/j.jaccas.2022.03.015. eCollection 2022 Sep 7.
Cardiac Arrest in a Softball Player Following a Collision: Catching the Correct Diagnosis.
Lander BS(1), Zilinyi RS(1), Einstein AJ(1)(2), Leb JS(2), Rosenbaum MS(1), Bacha EA(3), Sampson B(2), Tolani S(1).
ABSTRACT

Commotio cordis is a rare cause of sudden cardiac arrest from blunt chest trauma; however, it is a diagnosis of exclusion. We present a case of sudden cardiac arrest in a collegiate athlete initially attributed to commotio cordis but in whom further history and workup revealed another rare condition.

7. Int J Surg Case Rep. 2022 Sep 14;99:107659. doi: 10.1016/j.ijscr.2022.107659. Online ahead of print.

Pseudo-aortic dissection after sudden cardiac death in coronary angiography a case report: Pearls and pitfalls in false aortic dissection artifacts.

García-Escobar A(1), Vera-Vera S(2), Jurado-Román A(2), Jiménez-Valero S(2), Galeote G(2), Moreno R(2).

ABSTRACT

INTRODUCTION AND IMPORTANCE: Various artifacts mimicked aortic dissection, such as streak artifacts generated by high-attenuation material, high-contrast interfaces, cardiac motion, periaortic structures, aortic wall motion, and normal aortic sinuses, have been described in the literature. Most artifacts that simulate ascending aortic dissection occur frequently on conventional CT. Their position is predictable and is related to systolic aortic motion. However, so far, to the best of our knowledge, this is the first pseudo-aortic dissection reported during coronary angiography in cardiac arrest. CASE PRESENTATION: We report a case of a middle-aged man transferred to our hospital after an out-of-hospital cardiac arrest. The coronary angiography revealed non-obstructive coronary arteries and an image of probable aortic dissection was observed. Given the persistent asystole despite a prolonged advance cardiopulmonary resuscitation and the possibility of aortic dissection, a prompt in-room heart team discussion was performed. It was decided to stop and withdraw potentially life-sustaining treatment due to futility. The necropsy study revealed the aorta with some mild atherosclerotic plaques but without either aneurysm or thrombosis. The coronary arteries were reported as with patency, but in the proximal left anterior descending artery (LAD), the intima layer presented a thickness that decreased 50 % of the luminal area without signs of complicated acute plaques. CLINICAL DISCUSSION: In this case, the systolic aortic motion theory cannot explain the false-aortic dissection image in the coronary angiography because the patient was under cardiac arrest. Studies with arterial and venous pressures devices recording in cardiac arrest, demonstrated an abnormal hemodynamic flow, suggesting that the hemodynamic flow might be backward during cardiopulmonary resuscitation Therefore, in the setting of this abnormal hemodynamic flow, the injection of contrast may have an abnormal distribution and flow in the aorta creating an image of pseudo-aortic dissection. CONCLUSION: Although the exact mechanism of this false-positive aortic dissection in cardiac arrest remains unknown, operators should be aware of this entity during coronary angiography in the setting of cardiac arrest with mechanical chest compressions to avoid diagnostic errors in clinical practice.

8. Int J Surg Case Rep. 2022 Sep 13;99:107649. doi: 10.1016/j.ijscr.2022.107649. Online ahead of print.

Pneumoperitoneum following cardiopulmonary resuscitation: An unusual case.

Habibullah N(1), Soomar SM(2), Ali N(3).

ABSTRACT

INTRODUCTION AND IMPORTANCE: High-quality cardiopulmonary resuscitation (CPR) is the foundation of cardiac arrest resuscitation. Pneumoperitoneum due to gastric perforation is a rare surgical complication of CPR that, if left untreated, can result in significant morbidity and mortality. CASE PRESENTATION: We present a 51-year-old male patient with sealed perforation who received an urgent but non-diagnostic exploratory laparotomy after initial esophageal intubation and

resuscitation in cardiac arrest, despite significant evidence of surgical pneumoperitoneum. CLINICAL DISCUSSION: It is unusual to experience spontaneous pneumoperitoneum after cardiopulmonary resuscitation. We should promote cardiopulmonary resuscitation training for both medical and non-medical personnel. CONCLUSION: Early endotracheal intubation, avoidance of esophageal intubation, and quick insertion of an orogastric tube may reduce the risk of gastric perforation.

9. JACC Case Rep. 2022 Sep 7;4(17):1110-1114. doi: 10.1016/j.jaccas.2022.06.005. eCollection 2022 Sep 7.

Coronary Artery Disease, Cardiac Arrest, and Shared Decision Making in a Recreational Athlete.

Kanwal AS(1), Battle J(2), Friedman EM(3).

ABSTRACT

A highly active 59-year-old-man with a history of cardiac arrest and myocardial infarction presented for exercise recommendations. Multimodality risk stratification led to ventricular fibrillation cardiac arrest at the completion of a maximal effort cardiopulmonary exercise test. Using shared decision making, the safety and feasibility of returning to exercise were discussed.

10. J Med Toxicol. 2022 Oct;18(4):344-349. doi: 10.1007/s13181-022-00904-4. Epub 2022 Jul 5.

Benzonatate Overdose Presenting as Cardiac Arrest with Rapidly Narrowing QRS Interval.

Stephens RJ(1), Filip AB(2), Baumgartner KT(2), Schwarz ES(2), Liss DB(2).

ABSTRACT

INTRODUCTION: Benzonatate is a local anesthetic-like sodium channel antagonist that is widely prescribed as an antitussive. While it may be reasonable to assume that patients would present with a prolonged QRS interval following benzonatate overdose, the published literature does not support this. We report a case of a patient presenting following a benzonatate overdose with a prolonged QRS on her initial electrocardiograph (ECG) rhythm strip with rapid normalization of QRS duration. CASE REPORT: A 14-year-old girl presented in cardiac arrest following a benzonatate overdose. The patient was found in cardiac arrest within minutes of last being known well. Bystanders immediately provided cardiopulmonary resuscitation (CPR), and she was in asystole on emergency medical services (EMS) arrival. Return of spontaneous circulation (ROSC) was obtained following administration of intraosseous epinephrine and naloxone. EMS obtained an ECG rhythm strip following ROSC demonstrating a sinus rhythm with a QRS duration of 160 ms. Over the ensuing 30 minutes, there was progressive narrowing of the QRS. A 12-lead ECG obtained on arrival in the emergency department (ED) 44 minutes later demonstrated a QRS duration of 94 ms. Initially, EMS ECG rhythm strips were unavailable and an isolated benzonatate ingestion was considered less likely as ECG intervals were normal. Benzonatate exposure was later confirmed with a urine benzonatate concentration, which was 8.5 mcg/mL. The patient made a full recovery. DISCUSSION: Cases of pediatric benzonatate overdose with rapid development of cardiac arrest and full recovery have been previously reported. In this case, evidence of cardiac sodium channel blockade was demonstrated with a prolonged QRS interval on initial ECG rhythm strip analysis. However, unlike previous cases, rapid resolution of QRS prolongation occurred in this case. While transient QRS prolongation may be observed, finding a normal QRS interval should not discount the possibility of benzonatate overdose.