

GUIES

Les noves guies fan que les compressions es facin més profundes, però no suficient. Val a dir que la diferència és significativa pel número tan gran de pacients inclosos, però que clínicament la diferència de les mitjanes (2,5mm) és pràcticament menyspreable.

Resuscitation. 2014 Jan 10. pii: S0300-9572(14)00012-4. doi: 10.1016/j.resuscitation.2013.12.030. [Epub ahead of print]

Chest compression depth after change in CPR guidelines-improved but not sufficient.

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Abstract

AIMS:

Cardiopulmonary resuscitation is one of the most vital therapeutic options for patients with cardiac arrest. Sufficient chest compression depth turned out to be of utmost importance to increase the likelihood of a return of spontaneous circulation. Furthermore, the use of real-time feedback-systems for resuscitation is associated with improvement of compression quality. The European Resuscitation Council changed their recommendation about minimal compression depth from 2005 (40mm) to 2010 (50mm). The aim of the present study was to determine whether this recommendation of the new guidelines was implemented successfully in an Emergency medical service using a real-time feedback-system and to what extent a guideline-based CPR training leads to a "change in behaviour" of rescuers, respectively.

METHODS AND RESULTS:

The electronic resuscitation data of 294 patients were analysed retrospectively within two observational periods regarding fulfilment of the corresponding chest compression guideline requirements: ERC 2005 (40mm) 01.07.2009-30.06.2010 (n=145) and ERC 2010 (50mm) 01.07.2011-30.06.2012 (n=149). The mean compression depth during the first period was 47.1mm (SD 11.1) versus 49.6mm (SD 12.0) within the second period (p<0.001). With respect to the corresponding ERC Guidelines 2005 and 2010, the proportion of chest compressions reaching the minimal depth decreased (73.9% vs. 49.1%) (p<0.001). There was no correlation between compression depth and patient age, sex or duration of resuscitation.

CONCLUSIONS:

The present study was able to show a significant increase in chest compression depth after implementation of the new ERC guidelines. Even by using a real-time feedback system we failed to sustain chest compression quality at the new level as set by ERC guidelines 2010. In consequence, the usefulness of a fixed chest compression depth should be content of further investigations.

ORGANITZACIÓ

Han d'haver metges a les ambulàncies??? Sembla que si, al menys per atendre les aturades. No sabeu com m'alegro!!!

PLoS One. 2014 Jan 8;9(1):e84424. doi: 10.1371/journal.pone.0084424.

Physician Presence in an Ambulance Car Is Associated with Increased Survival in Out-of-Hospital Cardiac Arrest: A Prospective Cohort Analysis.

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Abstract

The presence of a physician seems to be beneficial for pre-hospital cardiopulmonary resuscitation (CPR) of patients with out-of-hospital cardiac arrest. However, the effectiveness of a physician's presence during CPR before hospital arrival has not been established. We conducted a prospective, non-randomized, observational study using national data from out-of-hospital cardiac arrests between 2005 and 2010 in Japan. We performed a propensity analysis and examined the association between a physician's presence during an ambulance car ride and short- and long-term survival from out-of-hospital cardiac arrest. Specifically, a full non-parsimonious logistic regression model was fitted with the physician presence in the ambulance as the dependent variable; the independent variables included all study variables except for endpoint variables plus dummy variables for the 47 prefectures in Japan (i.e., 46 variables). In total, 619,928 out-of-hospital cardiac arrest cases that met the inclusion criteria were analyzed. Among propensity-matched patients, a positive association was observed between a physician's presence during an ambulance car ride and return of spontaneous circulation (ROSC) before hospital arrival, 1-month survival, and 1-month survival with minimal neurological or physical impairment (ROSC: OR = 1.84, 95% CI 1.63-2.07, $p=0.00$ in adjusted for propensity and all covariates); 1-month survival: OR = 1.29, 95% CI 1.04-1.61, $p=0.02$ in adjusted for propensity and all covariates); cerebral performance category (1 or 2): OR = 1.54, 95% CI 1.03-2.29, $p=0.04$ in adjusted for propensity and all covariates); and overall performance category (1 or 2): OR = 1.50, 95% CI 1.01-2.24, $p=0.05$ in adjusted for propensity and all covariates). A prospective observational study using national data from out-of-hospital cardiac arrests shows that a physician's presence during an ambulance car ride was independently associated with increased short- and long-term survival.

Els alumnes de Medicina poden fer una bona ressuscitació (suposant que els ensenyem, és clar)

Am J Emerg Med. 2013 Dec 11. pii: S0735-6757(13)00844-9. doi: 10.1016/j.ajem.2013.12.007. [Epub ahead of print]

Medical students do not adversely affect the quality of cardiopulmonary resuscitation for ED patients.

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Abstract

OBJECTIVES:

To investigate the effect of medical student involvement on the quality of actual cardiopulmonary resuscitation (CPR).

METHODS:

A digital video-recording system was used to record and analyze CPR procedures for adult patients from March 2011 to September 2012.

RESULTS:

Twenty-six student-involved and 40 non-student-involved cases were studied. The chest compression rate in the student-involved group was significantly higher than that in the non-student-involved group ($P < .001$). The proportion of compressions at "above 110 cpm" was higher in the student-involved group ($P = .021$), whereas the proportion at "90-110 cpm" was lower in the student-involved group ($P = .015$). The ratio of hands-off time to total manual compression time was significantly lower in the student-involved group than in the non-student-involved group ($P = .04$). In contrast, the student-involved group delivered a higher ventilation rate compared with the non-student-involved group ($P = .02$). The observed time delay to first compression and first ventilation were very similar between the groups. There were no significant differences between the groups in either return of spontaneous circulation or time from survival to discharge.

CONCLUSION:

Student-involved resuscitation teams were able to perform good CPR, with higher compression rates and fewer interruptions. However, the supervision from medical staff is still needed to ensure appropriate chest compression and ventilation rate in student-involved actual CPR in the emergency department.

CURES POST-RCE

Que tindran aquests nòrdics que fan les coses tan bé... serà perquè a Stavanger tenen la central de Laerdal? ;)

Resuscitation. 2014 Jan 9. pii: S0300-9572(14)00011-2. doi: 10.1016/j.resuscitation.2014.01.002. [Epub ahead of print]

Life years saved, standardised mortality rates and causes of death after hospital discharge in out-of-hospital cardiac arrest survivors.

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Abstract

Aim of the study: Out-of-hospital cardiac arrest (OHCA) accounts for many unexpected deaths in Europe and the survival rates in different regions vary considerably. We have previously reported excellent survival to discharge rates in the Stavanger region. We now describe the long-term outcome of OHCA victims in our region. Methods: In this retrospective observational study, we followed all OHCA hospital discharge survivors between 01.07.2002 and 30.06.2011 ($n=213$) for a minimum of 1 year and up to 10 years. Based on the national death statistics stratified for gender and age, we could calculate the potential life years saved, standardised mortality rates (SMR) and delineate the causes of death after hospital discharge. Results: Of the 213 patients who were discharged from the hospital, 91% had a cardiac origin of their OHCA. The mean potential life years saved per patient was 22.8 years. The observed five-year survival rate was 76%. The overall SMR in our study cohort was 2.3 when compared to the age- and gender-matched population. Cardiac disease was a prominent cause of late deaths, with the specific SMR for cardiac disease-related deaths being as high as 42 in males and 140 in females. Conclusion: Resuscitation of OHCA victims lead to a significant long-term benefit with respect to life years saved. Cardiac disease was the main cause of death after hospital discharge. More studies are needed to identify the potential of therapeutic interventions and

rehabilitation efforts that may further enhance the long-term outcomes in OHCA hospital discharge survivors.

Potser els inotropics que donem per les alteracions hemodinàmiques de la hipotèrmia poden empitjorar el pronòstic.

Resuscitation. 2014 Jan 9. pii: S0300-9572(14)00013-6. doi: 10.1016/j.resuscitation.2013.12.031. [Epub ahead of print]

Hemodynamics and vasopressor support in therapeutic hypothermia after cardiac arrest: Prognostic implications.

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Abstract

AIM:

Inducing therapeutic hypothermia (TH) in out-of-hospital cardiac arrest (OHCA) can be challenging due to its impact on central hemodynamics and vasopressors are frequently used to maintain adequate organ perfusion. The aim of this study was to assess the association between level of vasopressor support and mortality.

METHODS:

In a 6-year period, 310 comatose OHCA patients treated with TH were included. Temperature, hemodynamic parameters and level of vasopressors were registered from admission to 24 hours after rewarming. Level of vasopressor support was assessed by the cardiovascular sub-score of Sequential Organ Failure Assessment (SOFA). The population was stratified by use of dopamine as first line intervention (D-group) or use of dopamine+norepinephrine/epinephrine (DA-group). Primary endpoint was 30-day mortality and secondary endpoint was in-hospital cause of death.

RESULTS:

Patients in the DA-group carried a 49% all-cause 30-day mortality rate compared to 23% in the D-group, $p < 0.0001$, corresponding to an adjusted hazard ratio (HR) of 2.0 (95%CI: 1.3-3.0), $p = 0.001$. The DA-group had an increased 30-day mortality due to neurological injury (HR=1.7 (95%CI: 1.1-2.7), $p = 0.02$). Cause of death was anoxic brain injury in 78%, cardiovascular failure in 18% and multi-organ failure in 4%. The hemodynamic changes of TH reversed at normothermia, although the requirement for vasopressor support (cardiovascular SOFA ≥ 3) persisted in 80% of patients.

CONCLUSIONS:

In survivors after OHCA treated with TH the induced hemodynamic changes reversed after normothermia, while the need for vasopressor support persisted. Patients requiring addition of norepinephrine/epinephrine on top of dopamine had an increased 30-day all-cause mortality, as well as death from neurological injury.

No hi ha diferència entre fer una PCI o trombolisis en els pacients recuperats d'una ACR secundària a un IAM, totes dues coses semblen millorar el pronòstic per igual.

Clinics (Sao Paulo). 2013 Apr;68(4):523-9. doi: 10.6061/clinics/2013(04)14.

Comparing percutaneous coronary intervention and thrombolysis in patients with return of spontaneous circulation after cardiac arrest.

Li YQ, Sun SJ, Liu N, Hu CL, Wei HY, Li H, Liao XX, Li X.

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Abstract

OBJECTIVE:

To evaluate the effects of percutaneous coronary intervention and thrombolysis after restoration of spontaneous circulation in cardiac arrest patients with ST-elevation myocardial infarction using meta-analysis.

METHODS:

We performed a meta-analysis of clinical studies indexed in the PUBMED, MEDLINE and EMBASE databases and published between January 1995 and October 2012. In addition, we compared the hospital discharge and neurological recovery rates between the patients who received percutaneous coronary intervention and those who received thrombolysis.

RESULTS:

Twenty-four studies evaluating the effects of percutaneous coronary intervention or thrombolysis after restoration of spontaneous circulation in cardiac arrest patients with ST-elevation myocardial infarction were included. Seventeen of the 24 studies were used in this meta-analysis. All studies were used to compare percutaneous coronary intervention and thrombolysis. The meta-analysis showed that the rate of hospital discharge improved with both percutaneous coronary intervention ($p < 0.001$) and thrombolysis ($p < 0.001$). We also found that cardiac arrest patients with ST-elevation myocardial infarction who received thrombolysis after restoration of spontaneous circulation did not have decreased hospital discharge ($p = 0.543$) or neurological recovery rates ($p = 0.165$) compared with those who received percutaneous coronary intervention.

CONCLUSION:

In cardiac arrest patients with ST-elevation myocardial infarction who achieved restoration of spontaneous circulation, both percutaneous coronary intervention and thrombolysis improved the hospital discharge rate. Furthermore, there were no significant differences in the hospital discharge and neurological recovery rates between the percutaneous coronary intervention-treated group and the thrombolysis-treated group.

Una revisió sobre el pronòstic dels pacients recuperats d'una ACR sotmesos a hipotèrmia. No tinc accés a la revista, però m'ha semblat interessant posar-vos-ho.

Crit Care. 2014 Jan 14;18(1):202. [Epub ahead of print]

How to assess prognosis after cardiac arrest and therapeutic hypothermia.

Taccone FS, Cronberg T, Friberg H, Greer D, Horn J, Oddo M, Scolletta S, Vincent JL.

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Abstract

The prognosis of patients who are admitted in a comatose state following successful resuscitation after cardiac arrest remains uncertain. Although the introduction of therapeutic hypothermia (TH) and improvements in post-resuscitation care have significantly increased the number of patients who are discharged home with minimal brain damage, short-term assessment of neurological outcome remains a challenge. The need for early and accurate prognostic predictors is crucial, especially since sedation and TH may alter the neurological examination and delay the recovery of motor response for several days. The development of additional tools, including electrophysiological examinations (electroencephalography and somatosensory evoked potentials), neuroimaging and chemical biomarkers, may help to evaluate the extent of brain injury in these patients. Given the extensive literature existing on

this topic and the confounding effects of TH on the strength of these tools in outcome prognostication after cardiac arrest, the aim of this narrative review is to provide a practical approach to post-anoxic brain injury when TH is used. We also discuss when and how these tools could be combined with the neurological examination in a multimodal approach to improve outcome prediction in this population.

ACR INTRAHOSPITALÀRIA

Com és la supervivència de les ACR a les UCIs? Atenció que una de les autores és la Maaret Castren, la Gran Jefa de l'ERC.

Resuscitation. 2014 Jan 7. pii: S0300-9572(14)00007-0. doi: 10.1016/j.resuscitation.2013.12.027. [Epub ahead of print]

Incidence and outcome from adult cardiac arrest occurring in the intensive care unit: A systematic review of the literature.

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Abstract

BACKGROUND:

Significant amount of data on the incidence and outcome of out-of-hospital and in-hospital cardiac arrest have been published. Cardiac arrest occurring in the intensive care unit has received less attention.

AIMS:

To evaluate and summarize current knowledge of intensive care unit cardiac arrest including quality of data, and results focusing on incidence and patient outcome. Sources and methods: We conducted a literature search of the PubMed, CINAHL and Cochrane databases with the following search terms (Medical Subheadings): heart arrest AND intensive care unit OR critical care OR critical care nursing OR monitored bed OR monitored ward OR monitored patient. We included articles published from the 1st of January 1990 till 31st of December 2012. After exclusion of all duplicates and irrelevant articles we evaluated quality of studies using a predefined quality assessment score and summarized outcome data.

RESULTS:

The initial search yielded 794 articles of which 780 were excluded. Three papers were added after a manual search of the eligible studies' references. One paper was identified manually from the literature published after our initial search was completed, thus the final sample consisted of 18 papers. Of the studies included thirteen were retrospective, two based on prospective registries and three were focused prospective studies. All except two studies were from a single institution. Six studies reported the incidence of intensive care unit cardiac arrest, which varied from 5.6 to 78.1 cardiac arrests per 1000 intensive care unit admissions. The most frequently reported initial cardiac arrest rhythms were non-shockable. Patient outcome was variable with survival to hospital discharge being in the range of 0-79% and long-term survival ranging from 1-69%. Nine studies reported neurological status of survivors, which was mostly favorable, either no neurological sequelae or cerebral performance score mostly of 1-2. Studies focusing on post cardiac surgery patients reported the best long-term survival rates of 45-69%.

CONCLUSIONS:

At present data on intensive care unit cardiac arrest is quite limited and originates mostly from retrospective single center studies. The quality of data overall seems to be poor and thus focused prospective multi-center studies are needed.

*Si als USA hi ha variabilitat en la supervivència de les ACR, nosaltres no anirem gaire enrere ni dins ni fora dels hospitals. No hauríem de barallar-nos com a Consell Català de Ressuscitació per potenciar la creació d'un **Codi Aturada**?*

J Am Heart Assoc. 2014 Jan 31;3(1):e000400. doi: 10.1161/JAHA.113.000400.

Hospital Variation in Survival After In-hospital Cardiac Arrest.

Merchant RM, Berg RA, Yang L, Becker LB, Groeneveld PW, Chan PS; American Heart Association's Get With the Guidelines-Resuscitation Investigators.

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Abstract

BACKGROUND: In-hospital cardiac arrest (IHCA) is common and often fatal. However, the extent to which hospitals vary in survival outcomes and the degree to which this variation is explained by patient and hospital factors is unknown.

METHODS AND RESULTS: Within Get with the Guidelines-Resuscitation, we identified 135 896 index IHCA events at 468 hospitals. Using hierarchical models, we adjusted for demographics comorbidities and arrest characteristics (eg, initial rhythm, etiology, arrest location) to generate risk-adjusted rates of in-hospital survival. To quantify the extent of hospital-level variation in risk-adjusted rates, we calculated the median odds ratio (OR). Among study hospitals, there was significant variation in unadjusted survival rates. The median unadjusted rate for the bottom decile was 8.3% (range: 0% to 10.7%) and for the top decile was 31.4% (28.6% to 51.7%). After adjusting for 36 predictors of in-hospital survival, there remained substantial variation in rates of in-hospital survival across sites: bottom decile (median rate, 12.4% [0% to 15.6%]) versus top decile (median rate, 22.7% [21.0% to 36.2%]). The median OR for risk-adjusted survival was 1.42 (95% CI: 1.37 to 1.46), which suggests a substantial 42% difference in the odds of survival for patients with similar case-mix at similar hospitals. Further, significant variation persisted within hospital subgroups (eg, bed size, academic).

CONCLUSION: Significant variability in IHCA survival exists across hospitals, and this variation persists despite adjustment for measured patient factors and within hospital subgroups. These findings suggest that other hospital factors may account for the observed site-level variations in IHCA survival.

PRONÒSTIC

La combinació de diferents tècniques permeten una bona predicció pronòstica.

Crit Care Med. 2014 Jan 22. [Epub ahead of print]

Early Multimodal Outcome Prediction After Cardiac Arrest in Patients Treated With Hypothermia.

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Abstract

OBJECTIVES: Therapeutic hypothermia and pharmacological sedation may influence outcome prediction after cardiac arrest. The use of a multimodal approach, including clinical examination, electroencephalography, somatosensory-evoked potentials, and serum neuron-specific enolase, is

recommended; however, no study examined the comparative performance of these predictors or addressed their optimal combination.

DESIGN: Prospective cohort study.

SETTING: Adult ICU of an academic hospital.

PATIENTS: One hundred thirty-four consecutive adults treated with therapeutic hypothermia after cardiac arrest.

MEASUREMENTS AND MAIN RESULTS: Variables related to the cardiac arrest (cardiac rhythm, time to return of spontaneous circulation), clinical examination (brainstem reflexes and myoclonus), electroencephalography reactivity during therapeutic hypothermia, somatosensory-evoked potentials, and serum neuron-specific enolase. Models to predict clinical outcome at 3 months (assessed using the Cerebral Performance Categories: 5 = death; 3-5 = poor recovery) were evaluated using ordinal logistic regressions and receiving operator characteristic curves. Seventy-two patients (54%) had a poor outcome (of whom, 62 died), and 62 had a good outcome. Multivariable ordinal logistic regression identified absence of electroencephalography reactivity ($p < 0.001$), incomplete recovery of brainstem reflexes in normothermia ($p = 0.013$), and neuron-specific enolase higher than $33 \mu\text{g/L}$ ($p = 0.029$), but not somatosensory-evoked potentials, as independent predictors of poor outcome. The combination of clinical examination, electroencephalography reactivity, and neuron-specific enolase yielded the best predictive performance (receiving operator characteristic areas: 0.89 for mortality and 0.88 for poor outcome), with 100% positive predictive value. Addition of somatosensory-evoked potentials to this model did not improve prognostic accuracy.

CONCLUSIONS: for prognostication of early postanoxic coma, whereas somatosensory-evoked potentials do not add any complementary information. Although prognostication of poor outcome seems excellent, future studies are needed to further improve prediction of good prognosis, which still remains inaccurate.

DEA

Com l'ús del DEA a les escoles influeix en el pronòstic

Circ J. 2014 Jan 27. [Epub ahead of print]

Circumstances and Outcomes of Out-Of-Hospital Cardiac Arrest in Elementary and Middle School Students in the Era of Public-Access Defibrillation.

Mitani Y, Ohta K, Ichida F, Nii M, Arakaki Y, Ushinohama H, Takahashi T, Ohashi H, Yodoya N, Fujii E, Ishikura K, Tateno S, Sato S, Suzuki T, Higaki T, Iwamoto M, Yoshinaga M, Nagashima M, Sumitomo N.

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Abstract

Background: Circumstances and outcomes of out-of-hospital cardiac arrest (OHCA) in elementary and middle school students while at school in the era of public-access defibrillation are unknown.

Methods and Results: We conducted a nationwide hospital-based survey of elementary and middle school students who had had OHCA of cardiac origin and received prehospital resuscitation in 2005-2009. Among 58 cases recruited, 90% were witnessed by bystanders; 86% had ventricular fibrillation as the initial rhythm; 74% were resuscitated by bystanders; 24% were defibrillated by bystanders; 55% occurred at school; 66% were exercise-related; 48% were followed up before the event; 67% had structural heart disease. In total, 53% of overall patients and 79% of those initially defibrillated by bystanders had a favorable neurological outcome. Patients were more likely to be defibrillated by bystanders (38% vs. 8%, $P=0.012$) and had a more favorable neurological outcome in schools (69% vs. 35%, $P=0.017$) than in other locations. The majority of arrests in schools were exercise-related (84% vs. 42%, $P=0.001$), occurred at sports venues, and students were resuscitated by teachers; half of the cases at school occurred in patients with a pre-event follow-up.

Conclusions: After OHCA, children were more likely to be defibrillated by bystanders and had a better outcome in schools than in other locations, which may be relevant to the circumstances of events.

DISPOSITIUS DE “FEEDBACK”

Sembla que no tots els dispositius de feedback són semblants...

Resuscitation. 2014 Jan 23. pii: S0300-9572(14)00045-8. doi: 10.1016/j.resuscitation.2014.01.015. [Epub ahead of print]

A randomised control trial of prompt and feedback devices and their impact on quality of chest compressions-a simulation study.

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Abstract

AIM: This study aims to compare the effect of three CPR prompt and feedback devices on quality of chest compressions amongst healthcare providers.

METHODS: A single blinded, randomised controlled trial compared a pressure sensor/metronome device (CPREzy™), an accelerometer device (Phillips Q-CPR) and simple metronome on the quality of chest compressions on a manikin by trained rescuers. The primary outcome was compression depth. Secondary outcomes were compression rate, proportion of chest compressions with inadequate depth, incomplete release and user satisfaction.

RESULTS: The pressure sensor device improved compression depth (37.24mm to 43.64mm, $p=0.02$), the accelerometer device decreased chest compression depth (37.38mm to 33.19mm, $p=0.04$) whilst the metronome had no effect (39.88mm vs 40.64mm, $p=0.802$). Compression rate fell with all devices (pressure sensor device 114.68/min to 98.84/min, $p=0.001$, accelerometer 112.04/min to 102.92/min, $p=0.072$ and metronome 108.24/min vs 99.36/min, $p=0.009$). The pressure sensor feedback device reduced the proportion of compressions with inadequate depth (0.52 vs 0.24, $p=0.013$) whilst the accelerometer device and metronome did not have a statistically significant effect. Incomplete release of compressions was common, but unaffected by the CPR feedback devices. Users preferred the accelerometer and metronome devices over the pressure sensor device. A post hoc study showed that de-activating the voice prompt on the accelerometer device prevented the deterioration in compression quality seen in the main study.

CONCLUSION: CPR feedback devices vary in their ability to improve performance. In this study the pressure sensor device improved compression depth, whilst the accelerometer device reduced it and metronome had no effect.

Segons aquest estudi d'investigadors del País Basc, la variació en la impedància transtoràcica durant les compressions toràciques no permet predir la profunditat de les compressions com alguns fabricants diuen.

Resuscitation. 2014 Jan 23. pii: S0300-9572(14)00046-X. doi: 10.1016/j.resuscitation.2013.12.035. [Epub ahead of print]

Can thoracic impedance monitor the depth of chest compressions during out-of-hospital cardiopulmonary resuscitation?

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States.4Department of Emergency Medicine, Oregon Health & Science University, 97239-3098 Portland, OR, United States.

Abstract

AIM: To analyze the relationship between the depth of the chest compressions and the fluctuation caused in the thoracic impedance (TI) signal in out-of-hospital cardiac arrest (OHCA). The ultimate goal was to evaluate whether it is possible to identify compressions with inadequate depth using information of the TI waveform.

METHODS: 60 OHCA episodes were extracted, one per patient, containing both compression depth (CD) and TI signals. Every 5s the mean value of the maxima of the CD, Dmax, and three features characterizing the fluctuations caused by the compressions in the TI waveform (peak-to-peak amplitude, area and curve length) were computed. The linear relationship between Dmax and the TI features was tested using Pearson correlation coefficient (r) and univariate linear regression for the whole population, for each patient independently, and for series of compressions provided by a single rescuer. The power of the three TI features to classify each 5s-epoch as shallow/non-shallow was evaluated in terms of area under the curve, sensitivity and specificity.

RESULTS: The r was 0.34, 0.36 and 0.37 for peak-to-peak amplitude, area and curve length respectively when the whole population was analyzed. Within patients the median r was 0.40, 0.43 and 0.47 respectively. The analysis of the series of compressions yielded a median r of 0.81 between Dmax and the peak-to-peak amplitude, but it decreased to 0.47 when all the series were considered jointly. The classifier based on the TI features showed 90.0%/37.1% and 86.2%/43.5% sensitivity/specificity values, and an area under the curve of 0.75 and 0.71 for the training and test set respectively.

CONCLUSION: Low linearity between CD and TI was noted in OHCA episodes involving multiple rescuers. Our findings suggest that TI is unreliable as a predictor of Dmax and inaccurate in detecting shallow compressions.

PREVENCIÓ DE L'ATURADA

Una revisió dels "Early Warning Scores" i el seu paper sobre la prevenció de l'ACR.

Resuscitation. 2014 Jan 24. pii: S0300-9572(14)00042-2. doi: 10.1016/j.resuscitation.2014.01.013. [Epub ahead of print]

The impact of the use of the Early Warning Score (EWS) on patient outcomes; a systematic review.

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Abstract

BACKGROUND: Acute deterioration in critical ill patients is often preceded by changes in physiological parameters, such as pulse, blood pressure, temperature and respiratory rate. If these changes in the patient's vital parameters are recognized early, excess mortality and serious adverse events (SAEs) such as cardiac arrest may be prevented. The Early Warning Score (EWS) is a scoring system which assists with the detection of physiological changes and may help identify patients at risk of further deterioration.

OBJECTIVES: The aim of this systematic review is to evaluate the impact of the use of the Early Warning Score (EWS) on particular patient outcomes, such as in-hospital mortality, patterns of intensive care unit admission and usage, length of hospital stay, cardiac arrests and other serious adverse events of adult patients on general wards and in medical admission units. Design and

setting: Systematic review of studies identified from the bibliographic databases of PubMed, EMBASE.com and The Cochrane Library. Selection criteria: All controlled studies which measured in-hospital mortality, ICU mortality, Serious Adverse Events (SAEs), cardiopulmonary arrest, length of stay and documentation of physiological parameters which used a EWS on the ward or the emergency department to identify patients at risk were included in the review. Data collection and analysis: Three reviewers (NA, AT and EH) independently screened all potentially relevant titles and abstracts for eligibility, by using a standardized data-worksheet. Meta-analysis was not possible due to heterogeneity. Main results: Seven studies met the inclusion criteria. The results of our included studies were mixed, with a positive trend towards better clinical outcomes following the introduction of the EWS chart, sometimes coupled with an outreach service. Six of the seven included studies used mortality as an endpoint: two of these studies reported no significant difference in in-hospital mortality rate; two found a significant reduction of in-hospital mortality; two other studies described a trend towards improved survival. Although, both ICU mortality and serious adverse events were not significantly improved, there was a trend towards reduction of these endpoints after introduction of the EWS. However only two studies looked respectively at each endpoint. There were conflicting results concerning cardiopulmonary arrests. One study found a reduction in the incidence of cardiac arrest calls as well as in the mortality of patients who underwent CPR, while another one found an increased incidence of cardio-pulmonary arrests. Neither study met all methodological quality criteria.

CONCLUSION: The EWS itself is a simple and easy to use tool at the bedside, which may be of help in recognizing patients with potential for acute deterioration. Coupled with an outreach service, it may be used to timely initiate adequate treatment upon recognition, which may influence the clinical outcomes positively. However, the use of adapted forms of the EWS together with different thresholds, poor or inadequate methodology makes it difficult in drawing comparisons. A general conclusion can thus not be generated from the lack of use of a single standardized score and the use of different populations. In future large multi-center trials using one standardized score are needed also in order to facilitate comparison.

FÀRMACS

Millora de la supervivència a curt termini dels pacients que eren tractats amb salí hipertònic

Resuscitation. 2014 Jan 23. pii: S0300-9572(14)00015-X. doi: 10.1016/j.resuscitation.2013.12.033. [Epub ahead of print]

during resuscitation from out-of-hospital cardiac arrest: A matched-pair study from the German Resuscitation Registry.

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Abstract

AIM: Survival rates after out-of-hospital-cardiac-arrest (OHCA) differ widely between EMS systems. Since hypertonic saline appears to improve long-term outcome after OHCA, some local EMS systems have included it in their treatment protocols for OHCA. Our first aim was to give a quality

review of one of these protocols. Our second aim was to assess whether short-term survival improves when hypertonic saline is used in resuscitation after OHCA.

METHODS: Matched pairs were identified for the independent "return of spontaneous circulation (ROSC) after cardiac arrest" (RACA) score variables and for use of ACD-CPR, adrenaline, and amiodarone from the German Resuscitation Registry (GRR) for January 2000 to March 2011. Patients received either 2ml/kg-1 hypertonic saline with hydroxyethyl starch (7.2% NaCl with 6% hydroxyethyl starch 200,000/0.5, HyperHAES® [HHS]) infused intravenously within 10min during CPR according to local treatment protocols or standard of care CPR (NON-HHS). The primary endpoint was admission to hospital rate (with spontaneous circulation); secondary endpoint was ROSC rate in relation to RACA score.

RESULTS: 322 matched pairs were defined for 14 variables. Predicted ROSC-rate using RACA-Score was similar in HHS (44.63%) and NON-HHS (43.63%; $p=0.440$). In contrast, 190 (59.0%) HHS patients achieved ROSC compared with only 136 NON-HHS patients (42.2%; $\chi^2: p<0.0001$). Short term survival measured as rate of "admission to hospital with spontaneous circulation" was achieved in 169 HHS patients (52.5%) versus 108 NON-HHS patients (33.5%) (OR 2.19; 95%CI: 1.592-3.009; $\chi^2: p<0.0001$).

CONCLUSION: Locally implemented treatment protocols using hypertonic saline/HES after OHCA are safe and effective. Also, we verified that short-term survival rates were better in patients receiving HHS.

Una reflexió (revisió) sobre la via intraòssia pels anestessistes

Anesthesiology. 2014 Jan 29. [Epub ahead of print]

Vascular Access in Resuscitation: Is There a Role for the Intraosseous Route?

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Abstract

Intraosseous vascular access is a time-tested procedure which has been incorporated into the 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation. Intravenous access is often difficult to achieve in shock patients, and central line placement can be time consuming. Intraosseous vascular access, however, can be achieved quickly with minimal disruption of chest compressions. Newer insertion devices are easy to use, making the intraosseous route an attractive alternative for venous access during a resuscitation event. It is critical that anesthesiologists, who are often at the forefront of patient resuscitation, understand how to properly use this potentially life-saving procedure.

EDUCACIÓ EN RESSUSCITACIÓ

Ajudant a fer les compressions empenyent les espatlles durant l'ensenyament de l'RCP millora la qualitat de les compressions.

Eur J Emerg Med. 2014 Jan 18. [Epub ahead of print]

Magical manoeuvre: a 5-s instructor's intervention helps lightweight female rescuers achieve the required chest compression depth.

Krikscionaitiene A, Pranskunas A, Stasaitis K, Dambrauskiene M, Jasinskas N, Dambrauskas Z, Vaitkaitiene E, Vencloviene J, Vaitkaitis D.

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Abstract

BACKGROUND: Adequate chest compression (CC) depth is crucial for resuscitation outcomes.

Lightweight rescuers, particularly women, are often unable to achieve the required 5-6 cm CC depth. This nonrandomized cohort study investigated new strategies to improve CC performance. **OBJECTIVE:** To evaluate the effects of a 5-s instructor's intervention on the depth of CCs performed by female rescuers during standard video self-instruction basic life support training. **METHODS:** Data were prospectively collected from January 2011 to January 2012 from 336 female medical and pharmacy students undergoing cardiopulmonary resuscitation (CPR) training at the Lithuanian University of Health Sciences. During the training process, the instructors performed a simple 5-s intervention (Andrew's manoeuvre) with all of the rescuers in the study group. The instructor pushed 10 times on the shoulders of each trainee while she performed CCs to achieve the maximal required compression depth. Immediately after training, the participants were asked to perform a 6-min basic life support test on a manikin that was connected to a PC with Skill Reporter System software; the quality of the participants' CPR skills was then evaluated. **RESULTS:** The CC depth in the study group increased by 6.4 mm ($P < 0.001$) compared with the control group (52.9 vs. 46.6 mm). A regression analysis showed that Andrew's manoeuvre increased the depth of the CCs among women by $14.87 \times (1 - 0.01 \times \text{weight})$ mm. **CONCLUSION:** A simple 5-s instructor's intervention during the CPR training significantly improved the performance of the female rescuers and helped them achieve the CC depth required by 2010 resuscitation guidelines. Andrew's manoeuvre is most effective among the women with the lowest body weight.

Sembla que els metges de la extrahospitalària d'Austria que exerceixen, tenen més coneixements de SVA que els que no fan. Sembla lògic, no?

Scand J Trauma Resusc Emerg Med. 2014 Jan 30;22(1):9. [Epub ahead of print]

Translation of ERC resuscitation guidelines into clinical practice by emergency physicians.

Fischer H, Bachmann K, Strunk G, Neuhold S, Zapletal B, Maurer C, Fast A, Stumpf D, Greif R.

Abstract

Purpose: Austrian out-of-hospital emergency physicians (OOHEP) undergo mandatory biannual emergency physician refresher courses to maintain their licence. The purpose of this study was to compare different reported emergency skills and knowledge, recommended by the European Resuscitation Council (ERC) guidelines, between OOHEP who work regularly at an out-of-hospital emergency service and those who do not currently work as OOHEP but are licenced.

METHODS: We obtained data from 854 participants from 19 refresher courses. Demographics, questions about their practice and multiple-choice questions about ALS-knowledge were answered and analysed. We particularly explored the application of therapeutic hypothermia, intraosseous access, pocket guide use and knowledge about the participants' defibrillator in use. A multivariate logistic regression analysed differences between both groups of OOHEP. Age, gender, years of clinical experience, ERC-ALS provider course attendance and the self-reported number of resuscitations were control variables.

RESULTS: Licenced OOHEP who are currently employed in emergency service are significantly more likely to initiate intraosseous access (OR = 4.013, $p < 0.01$), they initiate mild-therapeutic hypothermia after successful resuscitation (OR = 2.550, $p < 0.01$) more often, and knowledge about the used defibrillator was higher (OR = 2.292, $p < 0.01$). No difference was found for the use of pocket guides. OOHEP who have attended an ERC-ALS provider course since 2005 have initiated more mild therapeutic hypothermia after successful resuscitation (OR = 1.670, $p < 0.05$) as well as participants who resuscitated within the last year (OR = 2.324, $p < 0.01$), while older OOHEP initiated mild therapeutic hypothermia less often, measured per year of age (OR = 0.913, $p < 0.01$).

CONCLUSION: Licenced and employed OOHEP implement ERC guidelines better into clinical practice, but more training on life-saving rescue techniques needs to be done to improve knowledge and to raise these rates of application.

VENTILACIÓ

Un motiu més per no insistir en la intubació durant el SVA. El risc relatiu (la probabilitat) de recuperar circulació espontània en els 15 primers minuts de reanimació amb un intent d'intubació fallit, es multiplica per 0,5 (o es divideix per 2, com vulgueu).

Resuscitation. 2014 Feb 1. pii: S0300-9572(14)00049-5. doi: 10.1016/j.resuscitation.2014.01.017. [Epub ahead of print]

The Clinical Significance of a Failed Initial Intubation Attempt During Emergency Department Resuscitation of Out-of-Hospital Cardiac Arrest Patients.

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Abstract

OBJECTIVE: Advanced airway management is one of the fundamental skills of advanced cardiac life support (ACLS). A failed initial intubation attempt (FIIA) is common and has shown to be associated with adverse events. We analysed the association between FIIA and the overall effectiveness of ACLS.

METHODS: Using emergency department (ED) Out-of-hospital cardiac arrest (OHCA) registry data from 2008 to 2012, non-traumatic ED-resuscitated adult OHCA patients on whom endotracheal intubation was initially tried were identified. Prehospital and demographic factors and patient outcomes were retrieved from the registry. The presence of a FIIA was determined by reviewing nurse-documented CPR records. The primary outcome was achieving a return of spontaneous circulation (ROSC). The secondary outcomes were time to ROSC and the ROSC rate during the first 30 minutes of ED resuscitation.

RESULTS: The study population (n=512) was divided into two groups based on the presence of a FIIA (N=77). Both groups were comparable without significant differences in demographic or prehospital factors. In the FIIA group, the unadjusted and adjusted odds ratios (ORs) for achieving a ROSC were 0.50 (95% confidence interval [CI], 0.31-0.81) and 0.40 (95% CI, 0.23-0.71), respectively. Multivariable median regression analysis revealed that FIIA was associated with an average delay of 3 minutes in the time to ROSC (3.08; 95% CI, 0.08-5.80). Competing risk regression analysis revealed a significantly slower ROSC rate during the first 15 minutes (adjusted subhazard ratio, 0.52; 95% CI, 0.35-0.79) in the FIIA group.

CONCLUSION: FIIA is an independent risk factor for the decreased effectiveness of ACLS.

HIPOTÈRMIA

Una revisió sobre la hipotèrmia.

Chest. 2014 Feb 1;145(2):386-93. doi: 10.1378/chest.12-3025.

Clinical applications of targeted temperature management.

Perman SM, Goyal M, Neumar RW, Topjian AA, Gaieski DF.

Abstract

Targeted temperature management (TTM) has been investigated experimentally and used clinically for over 100 years. The initial rationale for the clinical application of TTM, historically referred to as therapeutic hypothermia, was to decrease the metabolic rate, allowing the injured brain time to heal. Subsequent research demonstrated the temperature dependence of diverse cellular mechanisms including endothelial dysfunction, production of reactive oxygen species, and apoptosis. Consequently, modern use of TTM centers on neuroprotection following focal or global neurologic injury. Despite a solid basic science rationale for applying TTM in a variety of disease processes, including cardiac arrest, traumatic brain injury, ischemic stroke, neonatal ischemic

encephalopathy, sepsis-induced encephalopathy, and hepatic encephalopathy, human efficacy data are limited and vary greatly from disease to disease. Ten years ago, two landmark investigations yielded high-quality data supporting the application of TTM in comatose survivors of out-of-hospital cardiac arrest. Additionally, TTM has been demonstrated to improve outcomes for neonatal patients with anoxic brain injury secondary to hypoxic ischemic encephalopathy. Trials are currently under way, or have yielded conflicting results in, examining the utility of TTM for the treatment of ischemic stroke, traumatic brain injury, and acute myocardial infarction. In this review, we place TTM in historic context, discuss the pathophysiologic rationale for its use, review the general concept of a TTM protocol for the management of brain injury, address some of the common side effects encountered when lowering human body temperature, and examine the data for its use in diverse disease conditions with in-depth examination of TTM for postarrest care and pediatric applications.

ESTUDIS EXPERIMENTALS

Sobre la velocitat del reescalfament influeix en l'efectivitat de la hipotèrmia

Crit Care Med. 2014 Feb;42(2):e106-13. doi: 10.1097/CCM.0b013e3182a63fff.

The effects of the rate of postresuscitation rewarming following hypothermia on outcomes of cardiopulmonary resuscitation in a rat model*.

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Abstract

OBJECTIVE:

To investigate the optimal rewarming rate following therapeutic hypothermia in a rat model of cardiopulmonary resuscitation. Both clinical and laboratory studies have demonstrated that mild therapeutic hypothermia following cardiopulmonary resuscitation improves myocardial and neurologic outcomes of cardiac arrest. However, the optimal rewarming strategy following therapeutic hypothermia remains to be explored.

DESIGN:

Prospective randomized controlled experimental study.

SETTING:

University-affiliated research institution.

SUBJECTS:

Twenty-three healthy male Sprague-Dawley rats.

INTERVENTIONS:

Four groups of Sprague-Dawley rats were randomized: 1) normothermia group (control), 2) rewarming rate at 2°C/hr, 3) rewarming rate at 1°C/hr, and 4) rewarming rate at 0.5°C/hr. Ventricular fibrillation was induced and untreated for 8 minutes, and defibrillation was attempted after 8 minutes of cardiopulmonary resuscitation. For the 2, 1, and 0.5°C/hr groups, rapid cooling was started at the beginning of cardiopulmonary resuscitation. On reaching the target cooling temperature of 33°C ± 0.2°C, the temperature was maintained with the aid of a cooling blanket until 4 hours after resuscitation. Rewarming was then initiated at the rate of 2.0, 1.0, or 0.5°C/hr, respectively, until the body temperature reached 37°C ± 0.2°C. Blood samples were drawn at baseline and postresuscitation of 4, 6, 8, 10, and 12 hours for the measurements of blood gas and serum biomarkers.

MEASUREMENTS AND MAIN RESULTS:

Blood temperature significantly decreased in the hypothermic groups from cardiopulmonary resuscitation to postresuscitation 4 hours. Significantly better cardiac output, ejection fraction, myocardial performance index, reduced neurologic deficit scores, and longer duration of survival were observed in the 1 and 0.5°C/hr groups. The increased serum concentration of troponin I, interleukin-6, and tumor necrosis factor- α was partly attenuated in the 1 and 0.5°C/hr groups when compared with the control and 2°C/hr groups.

CONCLUSIONS:

This study demonstrated that the severity of myocardial, cerebral injuries, and inflammatory reaction after cardiopulmonary resuscitation was reduced when mild therapeutic hypothermia was applied. A rewarming rate at 0.5-1°C/hr did not alter the beneficial effects of therapeutic hypothermia. However, a rapid rewarming rate at 2°C/hr abolished the beneficial effects of hypothermia.

Un mini-compresor toràctic que sembla que millora la perfusió cerebral (respecte la RCP convencional i en porcs)

Resuscitation. 2014 Jan 23. pii: S0300-9572(14)00043-4. doi: 10.1016/j.resuscitation.2014.01.014. [Epub ahead of print]

Miniaturized mechanical chest compressor improves calculated cerebral perfusion pressure without compromising intracranial pressure during cardiopulmonary resuscitation in a porcine model of cardiac arrest.

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Abstract

OBJECTIVE: One of the major goals of cardiopulmonary resuscitation (CPR) is to provide adequate oxygen delivery to the brain for minimizing cerebral injury resulted from cardiac arrest. The optimal chest compression during CPR should effectively improve brain perfusion without compromising intracranial pressure (ICP). Our previous study has demonstrated that the miniaturized mechanical chest compressor improved hemodynamic efficacy and the success of CPR. In the present study, we investigated the effects of the miniaturized chest compressor (MCC) on calculated cerebral perfusion pressure (CerPP) and ICP.

METHODS: Ventricular fibrillation was electrically induced and untreated for seven min in 13 male domestic pigs weighing 39±3kg. The animals were randomized to receive mechanical chest compression with the MCC (n=7), or the Thumper device (n=6). CPR was performed for five min before defibrillation attempt by a single 150J shock. At 2.5min of CPR, the epinephrine at a dose of 20µg/kg was administered. Additional epinephrine was administered at an interval of three min thereafter. If resuscitation was not successful, CPR was resumed for an additional two min prior to the next defibrillation until successful resuscitation or for a total of 15min. Post-resuscitated animals were observed for two hrs.

RESULTS: Significantly greater intrathoracic positive and negative pressures during compression and decompression phases of CPR were observed with the MCC when compared with the Thumper device. The MCC produced significantly greater coronary perfusion pressure and end-tidal carbon dioxide. There were no statistically significant differences in systolic and mean ICP between the two groups; however, both of the measurements were slightly greater in the MCC treated animals. Interestingly, the diastolic ICP was significantly lower in the MCC group, which was closely related to the significantly lower negative intrathoracic pressure in the animals that received the MCC. Most important, systolic, diastolic and mean calculated CerPP were all significantly greater in the animals receiving the MCC.

CONCLUSIONS: In the present study, mechanical chest compression with the MCC significantly improved calculated CerPP but did not compromise ICP during CPR. It may provide a safe and effective chest compression during CPR

La combinació d'òxid nítric inhalat i hipotèrmia millora el pronòstic dels ratolins.

Anesthesiology. 2014 Feb 3. [Epub ahead of print]

Beneficial Effects of Nitric Oxide on Outcomes after Cardiac Arrest and Cardiopulmonary Resuscitation in Hypothermia-treated Mice.

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Abstract

BACKGROUND: Therapeutic hypothermia (TH) improves neurological outcomes after cardiac arrest (CA) and cardiopulmonary resuscitation (CPR). Although nitric oxide prevents organ injury induced by ischemia and reperfusion, role of nitric oxide during TH after CPR remains unclear. In this article, the authors examined the impact of endogenous nitric oxide synthesis on the beneficial effects of hypothermia after CA/CPR. The authors also examined whether or not inhaled nitric oxide during hypothermia further improves outcomes after CA/CPR in mice treated with TH.

METHODS: Wild-type mice and mice deficient for nitric oxide synthase 3 (NOS3) were subjected to CA at 37°C and then resuscitated with chest compression. Body temperature was maintained at 37°C (normothermia) or reduced to 33°C (TH) for 24 h after resuscitation. Mice breathed air or air mixed with nitric oxide at 10, 20, 40, 60, or 80 ppm during hypothermia. To evaluate brain injury and cerebral blood flow, magnetic resonance imaging was performed in wild-type mice after CA/CPR.

RESULTS: Hypothermia up-regulated the NOS3-dependent signaling in the brain (n = 6 to 7).

Deficiency of NOS3 abolished the beneficial effects of hypothermia after CA/CPR (n = 5 to 6).

Breathing nitric oxide at 40 ppm improved survival rate in hypothermia-treated NOS3 mice (n = 6) after CA/CPR compared with NOS3 mice that were treated with hypothermia alone (n = 6; P < 0.05). Breathing nitric oxide at 40 (n = 9) or 60 (n = 9) ppm markedly improved survival rates in TH-treated wild-type mice (n = 51) (both P < 0.05 vs. TH-treated wild-type mice). Inhaled nitric oxide during TH (n = 7) prevented brain injury compared with TH alone (n = 7) without affecting cerebral blood flow after CA/CPR (n = 6).

CONCLUSIONS: NOS3 is required for the beneficial effects of TH. Inhaled nitric oxide during TH remains beneficial and further improves outcomes after CA/CPR. Nitric oxide breathing exerts protective effects after CA/CPR even when TH is ineffective due to impaired endogenous nitric oxide production.

Com en altres estats de baix fluxe, a l'ACR es forma un trombus intraventricular es forma en els primers minuts de FV. La majoria es resolen a l'iniciar les compressions toràciques en un model porcí.

Resuscitation. 2014 Feb 8. pii: S0300-9572(14)00064-1. doi: 10.1016/j.resuscitation.2014.01.030. [Epub ahead of print]

Left ventricular thrombus development during ventricular fibrillation and resolution during resuscitation in a swine model of sudden cardiac arrest.

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2Tufts University School of Medicine, Department of Emergency Medicine, Baystate Medical Center, 759 Chestnut Street, Springfield, MA 01199.

Abstract

BACKGROUND: Intracardiac thrombus is a well-known complication of low-flow cardiac states including acute myocardial infarction and atrial fibrillation. Little is known, however, about the formation of intracardiac (left ventricular [LV]) thrombus during the extreme low-flow state of cardiac arrest.

OBJECTIVE: Using a swine model of sudden cardiac arrest, we examined the sonographic development of LV thrombus over time after induction of ventricular fibrillation (VF) and resolution of thrombus with cardiopulmonary resuscitation (CPR).

METHODS: This observational study was IACUC approved. Forty-five Yorkshire swine were sedated, intubated, and instrumented under general anesthesia before VF was electrically induced.

Sonographic data was collected immediately after VF induction and at 2-minute intervals thereafter. Following 12 minutes of untreated VF, resuscitation was initiated with closed chest compressions using an oxygen-powered mechanical resuscitation device. Observations were continued during attempted resuscitation. At the end of the experiment, the animals were euthanized while still at a surgical depth of anesthesia. The data was analyzed descriptively.

RESULTS: Sonographic evidence of LV thrombus was observed in 43/45 animals (95.6% [95%CI: 85.2%, 98.8%]). Thrombus was detected within 6 minutes in 39/45 (86.7% [95%CI: 73.8%, 93.8%]) animals that developed thrombus. Thrombus resolved within two minutes after initiation of chest compressions in 31/43 (72.1% [95%CI: 57.3%, 83.3%]) animals.

CONCLUSION: Similar to other low-flow cardiac states, LV thrombus develops early in the natural history of VF arrest and resolves quickly once forward flow is re-established by chest compressions.

CENTRALS DE COORDINACIÓ

Comparació de dos sistemes de dispatching en l'ACR.

Resuscitation. 2014 Feb 10. pii: S0300-9572(14)00063-X. doi: 10.1016/j.resuscitation.2014.01.029. [Epub ahead of print]

Comparison of Medical Priority Dispatch (MPD) and Criteria Based Dispatch (CBD) relating to cardiac arrest calls.

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Abstract

BACKGROUND: Prompt emergency medical service (EMS) system activation with rapid delivery of pre-hospital treatment is essential for patients suffering out-of-hospital cardiac arrest (OHCA). The two most commonly used dispatch tools are medical priority dispatch (MPD) and criteria based dispatch (CBD). We compared cardiac arrest call processing using these two dispatch tools in two different dispatch centres.

METHODS: Observational study of adult EMS confirmed (non-EMS witnessed) OHCA calls during one year in Richmond, USA (MPD) and Oslo, Norway (CBD). Patients receiving CPR prior to call, interrupted calls or calls where the caller did not have access to the patients were excluded from analysis. Dispatch logs, ambulance records and digitalized dispatcher and caller voice recordings were compared.

RESULTS: The MPDS-site processed 182 cardiac arrest calls and the CBD-site 232, of which 100 and 140 calls met the inclusion criteria, respectively. The recognition of cardiac arrest was not different in the MPD and CBD systems; 82% vs. 77% ($p=0.42$), and pre-EMS arrival CPR instructions were offered to 81% vs. 74% ($p=0.22$) of callers, respectively. Time to ambulance dispatch was median (95% confidence interval) 15 (13, 17) vs. 33 (29, 36) seconds ($p<0.001$) and time to chest compression delivery; 4.3 (3.7, 4.9) vs. 3.7 (3.0, 4.1) minutes for the MPD and CBD systems, respectively ($p=0.05$)

CONCLUSION: Pre-arrival CPR instructions were offered faster and more frequently in the CBD system, but in both systems chest compressions were delayed 3-4minutes. Earlier recognition of cardiac arrest and improved CPR instructions may facilitate earlier lay rescuer CPR.

Avisen els primers rescatadors per una app del telèfon!!! No tinc l'article però m'ha sorprès tant l'abstract que us el poso igual.

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Development of a first-responder dispatch system using a smartphone.

Yonekawa C, Suzukawa M, Yamashita K, Kubota K, Yasuda Y, Kobayashi A, Matsubara H, Toyokuni Y. Author information: Department of Emergency and Critical Care Medicine, Jichi Medical University, Tochigi, Japan.

Abstract

We constructed a prototype community first responder (CFR) dispatch system. The system sends incident information, including a map, to the chosen CFR's mobile phone. We tested it in a simulation of 30 out-of-hospital cardiac arrest incidents which had occurred in the town of Moteji during the previous year. Thirty off-duty firefighters acted as CFRs and were sent to the same locations. The mean response time (from the CFR receiving dispatch information to arrival at the scene) was 3 min 37s faster than the actual response time in the corresponding historical control, i.e. the response time was reduced by 36% ($P < 0.01$). The median travel distance of the CFRs was 3.4 km and there was a positive correlation between response time and travel distance. The study showed that interactive communication between dispatcher and CFR was important for effective operation and that CFRs could reach an OHCA patient before the Emergency Medical Service arrives.

RCP PEDIÀTRICA

A les ACR d'origen no cardiac a l'edat pediàtrica (que són la majoria), la RCP pels "bystanders" és primordial per una recuperació amb bona funció neurològica (com era d'esperar).

BMJ Open. 2014 Feb 12;4(2):e003481. doi: 10.1136/bmjopen-2013-003481.

Factors associated with the clinical outcomes of paediatric out-of-hospital cardiac arrest in Japan.

Nagata T, Abe T, Noda E, Hasegawa M, Hashizume M, Hagihara A.

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Abstract

OBJECTIVES: To better understand and predict clinical outcomes of paediatric out-of-hospital cardiac arrest (OHCA).

DESIGN: A population-based, observational study.

SETTING: The National Japan Utstein Registry.

PARTICIPANTS: 2900 children aged 5-17 years who experienced OHCA and received resuscitation by emergency responders. Signal detection analysis using 17 variables was applied to identify factors associated with OHCA outcomes; the primary endpoint was cerebral performance category (CPC) 1 or 2. A validation study was conducted to verify the model.

RESULTS: OHCA was identified as cardiac origin in 706 participants and non-cardiac origin in 2194 participants. Rates of CPC 1 or 2 for cardiac and non-cardiac causes were 20% and 6.4%, respectively. Cardiac origin arrest was categorised following signal detection into six subgroups defined by public automated external defibrillator use, defibrillation by emergency medical service, age, initial ECG rhythm and eye-witness to arrest; the ranges of CPC 1 or 2 in the six subgroups were between 87.5% and 0.7%. Non-cardiac origin arrest was categorised into four subgroups. Bystander rescue breathing was the most significant factor contributing to outcome; additionally, two other factors-eye-witness to arrest and age-were also significant. CPC 1 or 2 rates ranged between 38.5% and 4% across the four subgroups. Rates of CPC 1 or 2 in the validation study did not differ among any subgroup.

CONCLUSIONS: For children who have OHCA from non-cardiac origin, bystander rescue breathing is mandatory to achieve CPC 1 or 2.

DESFIBRIL·LACIÓ

Una revisió sobre les tècniques per analitzar el ritme durant les compressions toràciques.

Biomed Res Int. 2014;2014:386010. Epub 2014 Jan 9.

Rhythm Analysis during Cardiopulmonary Resuscitation: Past, Present, and Future.

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Abstract

Survival from out-of-hospital cardiac arrest depends largely on two factors: early cardiopulmonary resuscitation (CPR) and early defibrillation. CPR must be interrupted for a reliable automated rhythm analysis because chest compressions induce artifacts in the ECG. Unfortunately, interrupting CPR adversely affects survival. In the last twenty years, research has been focused on designing methods for analysis of ECG during chest compressions. Most approaches are based either on adaptive filters to remove the CPR artifact or on robust algorithms which directly diagnose the corrupted ECG. In general, all the methods report low specificity values when tested on short ECG segments, but how to evaluate the real impact on CPR delivery of continuous rhythm analysis during CPR is still unknown. Recently, researchers have proposed a new methodology to measure this impact. Moreover, new strategies for fast rhythm analysis during ventilation pauses or high-specificity algorithms have been reported. Our objective is to present a thorough review of the field as the starting point for these late developments and to underline the open questions and future lines of research to be explored in the following years.

CASE REPORT

Un case report de lo bo que és el LUCAS. No m'he pogut estar! ;)

Emerg Nurse. 2014 Feb;21(9):28-30. doi: 10.7748/en2014.02.21.9.28.e1254.

Automated cardiopulmonary resuscitation: a case study.

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Abstract

Rates of survival after cardiac arrest are low and correlate with the quality of cardiopulmonary resuscitation (CPR). Devices that deliver automated CPR (A-CPR) can provide sustained and effective chest compressions, which are especially useful during patient transfer and while simultaneous invasive procedures are being performed. The use of such devices can also release members of resuscitation teams for other work. This article presents a case study involving a man with acute myocardial infarction complicated by cardiogenic shock and pulmonary oedema. It describes how ED nursing and medical teams worked together to deliver A-CPR, discusses the use of A-CPR devices in a tertiary cardiac centre, and highlights the advantages of using such devices.

Refreden amb la màquina de diàlisis!!!

Am J Emerg Med. 2013 Dec;31(12):1720.e1-3. doi: 10.1016/j.ajem.2013.07.012. Epub 2013 Aug 13.
Good neurologic recovery after cardiac arrest using hypothermia through continuous renal replacement therapy.

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Abstract

Therapeutic hypothermia (TH) is becoming a standard of care to mitigate neurologic injury in cardiac arrest survivors. Several cooling methods are available for use in TH. For maintaining a target temperature, intravascular cooling is superior to, more efficacious than, and safer than surface cooling methods. The use of an intravenous cooling catheter is independently associated with a higher odds ratio for survival. However, many techniques use commercially developed equipment that is expensive to purchase and use. The application and popularization of the intravascular cooling method have been difficult. In patients with pulmonary edema or cardiac insufficiency, liquid is restricted, so intravascular cooling systems cannot be used. Studies have shown abnormalities mimicking the immunologic and coagulation disorders observed in severe sepsis. Continuous renal replacement therapy has been widely used in the intensive care unit to improve clinical parameters and survival in patients with multiple-organ dysfunction of septic origin. Continuous renal replacement therapy can also be used as another type of core cooling method. We used continuous renal replacement therapy as a cooling method to induce TH in a patient who had a cardiac arrest, and the patient regained consciousness 52 hours later.