RCP MECÀNICA

La utiització del LUCAS dismunueix la fracció sense compressions durant la RCP i millora la freqüència de les compressions respecte a la RCP manual

Scand J Trauma Resusc Emerg Med. 2015 Apr 22;23(1):37. [Epub ahead of print]
Quality of cardiopulmonary resuscitation in out-of-hospital cardiac arrest before and after introduction of a mechanical chest compression device, LUCAS-2; a prospective, observational study.
Tranberg T1, Lassen JF2, Kaltoft AK3, Hansen TM4,5,6, Stengaard C7, Knudsen L8, Trautner S9, Terkelsen CJ10.
Abstract
BACKGROUND:
Mechanical chest compressions have been proposed to provide high-quality cardiopulmonary resuscitation (CPR), but despite the growing use of mechanical chest compression devices, only few studies have addressed their impact on CPR quality. This study aims to evaluate mechanical chest compressions provided by LUCAS-2 (Lund University Cardiac Assist System) compared with manual chest compression in a cohort of out-of-hospital cardiac arrest (OHCA) cases.
METHODS:
In this prospective study conducted in the Central Denmark Region, Denmark, the emergency medical service attempted resuscitation and reported data on 696 non-traumatic OHCA patients between April 2011 and February 2013. Of these, 155 were treated with LUCAS CPR after an episode with manual CPR. The CPR quality was evaluated using transthoracic impedance measurements collected from the LIFEPAK 12 defibrillator, and the effect was assessed in terms of chest compression rate, no-flow time and no-flow fraction; the fraction of time during resuscitation in which the patient is without spontaneous circulation receiving no chest compression.
RESULTS:
The median total episode duration was 21 minutes, and the episode with LUCAS CPR was significantly longer than the manual CPR episode, 13 minutes vs. 5 minutes, $p < 0.001$. The no-flow fraction was significantly lower during LUCAS CPR (16%) than during manual CPR (35%); difference 19% (95% CI: 16% to 21%; $p < 0.001$). No differences were found in pre- and post-shock no-flow time throughout manual CPR and LUCAS CPR. Contrary to the manual CPR, the average compression rate during LUCAS CPR was in conformity with the current Guidelines for Resuscitation, 102/minute vs. 124/minute, $p < 0.001$.
CONCLUSION:
Mechanical chest compressions provided by the LUCAS device improve CPR quality by significantly reducing the NFF and by improving the quality of chest compression compared with manual CPR during OHCA resuscitation. However, data on end-tidal Co2 and chest compression depth surrogate parameters of CPR quality could not be reported.

El LUCAS trenca més costelles que la RCP manual (també la RCP és més perllongada), però no ocasiona amb més freqüència lesions a altres òrgans.

Int J Legal Med. 2015 Jan 27. [Epub ahead of print]
Traumatic injuries after mechanical cardiopulmonary resuscitation (LUCAS™2): a forensic autopsy study.
Lardi C1, Egger C, Larribau R, Niquille M, Mangin P, Fracasso T.
Abstract
AIM:

The aim of our study was to compare traumatic injuries observed after cardiopulmonary resuscitation (CPR) by means of standard (manual) or assisted (mechanical) chest compression by Lund University Cardiopulmonary Assist System, 2nd generation (LUCAS™2) device.
METHODS:
A retrospective study was conducted including cases from 2011 to 2013, analysing consecutive autopsy reports in two groups of patients who underwent medicolegal autopsy after unsuccessful CPR. We focused on traumatic injuries from dermal to internal trauma, collecting data according to a standardised protocol.
RESULTS:
The study group was comprised of 26 cases, while 32 cases were included in the control group. Cardiopulmonary resuscitation performed by LUCAS™2 was longer than manual CPR performed in control cases (study group: mean duration 51.5 min; controls 29.4 min; p = 0.004). Anterior chest lesions (from bruises to abrasions) were described in 18/26 patients in the LUCAS™2 group and in 6/32 of the control group. A mean of 6.6 rib fractures per case was observed in the LUCAS™2 group, but this was only 3.1 in the control group (p = 0.007). Rib fractures were less frequently observed in younger patients. The frequency of sternal factures was similar in both groups. A few trauma injuries to internal organs (mainly cardiac, pulmonary and hepatic bruises), and some petechiae (study 46 %; control 41 %; p = 0.79) were recorded in both groups.
CONCLUSION:
LUCAS™2-CPR is associated with more rib fractures than standard CPR. Typical round concentric skin lesions were observed in cases of mechanical reanimation. No life-threatening injuries were reported. Petechiae were common findings.

No hi ha relació entre l'alçada del tòrax i la força que hem de fer per comprimir els 5cm, segons les dades que recull el LUCAS. Un dels autors (Hardig BM) és un dels investigadors de Physio Control a la fàbrica dels LUCAS a Suècia, amic meu i excel·lent persona.

Resuscitation. 2015 91:67-72
Force and depth of mechanical chest compressions and their relation to chest height and gender in an out-of-hospital setting.
Beesems SG, Hardig BM, Nilsson A, Koster RW.
Abstract
INTRODUCTION:
The LUCAS 2 device stores technical data that documents the chest compression process. We analyzed chest wall dimensions and mechanics stored during chest compressions on humans using data gathered with the LUCAS 2 device.
METHODS:
Data from LUCAS 2 devices used in out-of-hospital cardiac arrest were downloaded with dedicated proprietary software and matched to the corresponding patient data. Cases were included only if the suction cup was placed correctly, if it was not realigned during the first 5min of chest compressions, and if no other anomaly in device use was noted. Trauma cases were excluded.
RESULTS:
Ninety-five patients were included. All patients received manual CPR prior to the application of the device. The mean (SD) chest height was 232 (25)mm for males and 209 (26)mm for females (P<0.001). The mean (min-max) compression depth in patients with chest height >185mm was 53 (50-55)mm, corresponding with 19-28% of the chest diameter. The mean force required to achieve the compression depth of 53mm ranged between 219 and 568N. No correlation was found between chest height and force to reach 53mm depth (females: R2=0.001, males: R2=0.007).
CONCLUSION:

There was a large variation of the required force to achieve a compression depth of 53mm. No correlation was seen between chest height and maximum force required to compress the chest 53mm.

REGISTRES I REVISIONS

Un editorial sobre l'ús dels compressors toràcics mecànics.(no tinc accés a l'article)

Curr Opin Crit Care. 2015 Apr 17. [Epub ahead of print]
Mechanical devices for chest compression: to use or not to use?
Couper K1, Smyth M, Perkins GD.
Abstract
PURPOSE OF REVIEW:
The delivery of high-quality manual chest compressions is rarely achieved in practice. Mechanical chest compression devices can consistently deliver high-quality chest compressions. The recent publication of large prehospital trials of these devices provides important new information about the role of these devices.
RECENT FINDINGS:
The Circulation Improving Resuscitation Care (CIRC), LUCAS in cardiac arrest (LINC) and Prehospital Randomized Assessment of a Mechanical Compression Device (PARAMEDIC) trials have recently been published. All these large prehospital trials found that the routine use of mechanical compression devices in the prehospital setting did not improve survival rates compared to those observed with manual chest compressions. There remain limited data on the routine use of devices during in-hospital cardiac arrest. Observational studies report favourable outcomes with the use of mechanical devices in special circumstances, including as a bridge to advanced therapies such as extracorporeal membrane oxygenation.
SUMMARY:
Mechanical cardiopulmonary resuscitation (CPR) results in similar survival rates to manual CPR in out of hospital cardiac arrest. There are insufficient data to support or refute the routine use of mechanical CPR devices during in-hospital cardiac arrest. Observational studies demonstrate the feasibility of using mechanical CPR when manual CPR is difficult or impossible, and as a bridge to advanced therapies.

La probabilitat de recuperar circulació espontània decau un 4% per cada minut (des de la trucada) que triguem a posar adrenalina o vasopresina…

Prehosp Emerg Care. 2015 Apr 24. [Epub ahead of print]
Probability of Return of Spontaneous Circulation as a Function of Timing of Vasopressor Administration in Out-of-Hospital Cardiac Arrest.
Hubble MW, Johnson C, Blackwelder J, Collopy K, Houston S, Martin M, Wilkes D, Wiser J.
INTRODUCTION:
Vasopressors (epinephrine and vasopressin) are associated with return of spontaneous circulation (ROSC). Recent retrospective studies reported a greater likelihood of ROSC when vasopressors were administered within the first 10 minutes of arrest. However, it is unlikely that the relationship between ROSC and the timing of vasopressor administration is a binary function (i.e., ≤10 vs. >10 minutes). More likely, this relationship is a function of time measured on a continuum, with diminishing effectiveness even within the first 10 minutes of arrest, and potentially, some lingering benefit beyond 10 minutes. However, this relationship remains undefined.
OBJECTIVE:

To develop a model describing the likelihood of ROSC as a function of the call receipt to vasopressor interval (CRTVI) measured on a continuum.
METHODS:
We conducted a retrospective study of cardiac arrest using the North Carolina Prehospital Care Reporting System (PREMIS). Inclusionary criteria were all adult patients suffering a witnessed, nontraumatic arrest during January-June 2012. Chi-square and t-tests were used to analyze the relationships between ROSC and CRTVI; patient age, race, and gender; endotracheal intubation (ETI); automated external defibrillator (AED) use; presenting cardiac rhythm; and bystander cardiopulmonary resuscitation (CPR). A multivariate logistic regression model calculated the odds ratio (OR) of ROSC as a function of CRTVI while controlling for potential confounding variables.
RESULTS:
Of the 1,122 patients meeting inclusion criteria, 542 (48.3%) experienced ROSC. ROSC was less likely with increasing CRTVI (OR = 0.96, $p < 0.01$). Compared to patients with shockable rhythms, patients with asystole (OR = 0.42, $p < 0.01$) and pulseless electrical activity (OR = 0.52, $p < 0.01$) were less likely to achieve ROSC. Males (OR = 0.64, $p = 0.02$) and patients receiving bystander CPR (OR = 0.42, $p < 0.01$) were less likely to attain ROSC, although emergency medical services response times were significantly longer among patients receiving bystander CPR. Race, age, ETI, and AED were not predictors of ROSC.
CONCLUSIONS:
We found that time to vasopressor administration is significantly associated with ROSC, and the odds of ROSC declines by 4% for every 1-minute delay between call receipt and vasopressor administration. These results support the notion of a time-dependent function of vasopressor effectiveness across the entire range of administration delays rather than just the first 10 minutes. Large, prospective studies are needed to determine the relationship between the timing of vasopressor administration and long-term outcomes.

Mala hierba, nunca muere...

Crit Care. 2015 Apr 21;19(1):182. [Epub ahead of print]
Association of gender to outcome after out-of-hospital cardiac arrest - a report from the International Cardiac Arrest Registry.
Karlsson V1, Dankiewicz J2,3, Nielsen N4,5, Kern KB6, Mooney MR7, Riker RR8, Rubertsson S9, Seder DB10, Stammet P11, Sunde K12, Søreide E13,14, Unger BT15, Friberg H16,17.
Abstract
INTRODUCTION:
Previous studies have suggested an effect of gender on outcome after out-of-hospital cardiac arrest (OHCA), but the results are conflicting. We aimed to investigate the association of gender to outcome, coronary angiography (CAG) and adverse events in OHCA survivors treated with mild induced hypothermia (MIH).
METHODS:
We performed a retrospective analysis of prospectively collected data from the International Cardiac Arrest Registry. Adult patients with a non-traumatic OHCA and treated with MIH were included. Good neurological outcome was defined as a cerebral performance category (CPC) of 1 or 2.
RESULTS:
A total of 1667 patients, 472 women (28%) and 1195 men (72%), met the inclusion criteria. Men were more likely to receive bystander cardiopulmonary resuscitation, have an initial shockable rhythm and to have a presumed cardiac cause of arrest. At hospital discharge, men had a higher survival rate (52% vs. 38%, $p < 0.001$) and more often a good neurological outcome (43% vs. 32%, $p < 0.001$) in the univariate analysis. When adjusting for baseline

characteristics, male gender was associated with improved survival (OR 1.34, 95% CI: 1.01-1.78) but no longer with neurological outcome (OR 1.24, 95% CI: 0.92-1.67). Adverse events were common; women more often had hypokalemia, hypomagnesemia and bleeding requiring transfusion, while men had more pneumonia. In a subgroup analysis of patients with a presumed cardiac cause of arrest (n = 1361), men more often had CAG performed on admission (58% vs. 50%, p = 0.02) but this discrepancy disappeared in an adjusted analysis.
CONCLUSIONS:
Gender differences exist regarding cause of arrest, adverse events and outcome. Male gender was independently associated with survival but not with neurological outcome.

Uno nuestro!!! (pero no tengo acceso a la revista en español. En inglés si, pero no está traducido aún…)

Med Intensiva. 2015 Apr 17. pii: S0210-5691(15)00048-0. doi: 10.1016/j.medin.2015.02.005. [Epub ahead of print]
Recommendations in dispatcher-assisted bystander resuscitation from emergency call center.
[Article in English, Spanish]
García Del Águila J1, López-Messa J2, Rosell-Ortiz F1, de Elías Hernández R3, Martínez Del Valle M4, Sánchez-Santos L5, López-Herce J6, Cerdà-Vila M7, Roza-Alonso CL4, Bernardez-Otero M5; en nombre del Comité Científico del Consejo Español de Resucitación Cardiopulmonar (CERCP); Investigadores del proyecto Out of Hospital Spanish Cardiac Arrest Registry (OHSCAR, «Registro Español de Parada Cardiaca Extra-Hospitalaria»); Grupo Español de Reanimación Cardiopulmonar Pediátrica y Neonatal.
Abstract
Dispatch-assisted bystander cardiopulmonary resuscitation in out-of-hospital cardiac arrest has been shown as an effective measure to improve the survival of this process. The development of a unified protocol for all dispatch centers of the different emergency medical services can be a first step towards this goal in our environment. The process of developing a recommendations document and the realization of posters of dispatch-assisted cardiopulmonary resuscitation, agreed by different actors and promoted by the Spanish Resuscitation Council, is presented.

Per quan farem un codi Aturada "comme il faut"!!!

Circ J. 2015 Apr 16. [Epub ahead of print]
Usefulness of Cardiac Arrest Centers - Extending Lifesaving Post-Resuscitation Therapies: The Arizona Experience.
Kern KB1.
Abstract
The post-cardiac arrest syndrome is a complex, multisystems response to the global ischemia and reperfusion injury that occurs with the onset of cardiac arrest, its treatment (cardiopulmonary resuscitation) and the re-establishment of spontaneous circulation. Regionalization of post-cardiac arrest care, utilizing specified cardiac arrest centers (CACs), has been proposed as the best solution to providing optimal care for those successfully resuscitated after out-of-hospital cardiac arrest. A multidisciplinary team of intensive care specialists, including critical care/pulmonologists, cardiologists (general, interventional, and electrophysiology), neurologists, and physical medicine/rehabilitation experts, is crucial for such centers. Particular attention to the timely initiation of targeted temperature management and early coronary angiography/percutaneous coronary intervention is best provided by such CACs. A State-wide program of CACs was started in Arizona in 2007. This is a voluntary program, whereby medical centers agree to provide all resuscitated cardiac arrest patients

brought to their facility with state-of-the-art post-resuscitation care, including targeted temperature management for comatose patients and strong consideration for emergent coronary angiography for all patients with a likely cardiac etiology for their cardiac arrest. Survival improved by more than 50% at facilities that became CACs with a commitment to provide aggressive post-resuscitation care to all such patients. Providing aggressive, post-resuscitation care is the next real opportunity to increase long-term survival for cardiac arrest patients.

DESFIBRIL·LACIÓ

Desfibril·lació segura durant les compressions toràciques…

Resuscitation May 2015Volume 90, Pages 163–167
Achieving safe hands-on defibrillation using electrical safety gloves – A clinical evaluation
Introduction
Safe hands-on defibrillation (HOD) will allow uninterrupted chest compression during defibrillation and may improve resuscitation success. We tested the ability of electrical insulating gloves to protect the rescuer during HOD using a 'worst case' electrical scenario.
Materials and method
Leakage current flowing from the patient to the 'rescuer' during antero-lateral defibrillation of patients undergoing elective cardioversion was measured. The 'rescuer' maintained firm (20 kgf) contact with the patient during defibrillation, wearing Class 1 electrical insulating gloves while simulating an inadvertent contact with the patient, through an additional wired contact between 'rescuer' and patient.
Results
Data from 61 shocks from 43 different patients were recorded. The median leakage current from all defibrillations was 20.0 μA, (range: 2.0–38.5). In total, 18 of the shocks were delivered at 360 J and had a median leakage current of 27.0 μA (range: 14.3–38.5).
Conclusion
When using Class 1 electrical insulating gloves for hands-on defibrillation, rescuer leakage current is significantly below the 1 mA safe threshold, allowing safe hands-on defibrillation if the rescuer makes only one other point of contact with the patient.

HIPOTÈRMIA

Sobre els efectes secundaris de la hipotèrmia. No parla de supervivència.

Resuscitation. 2015 Apr 20. pii: S0300-9572(15)00157-4. doi: 10.1016/j.resuscitation.2015.04.007. [Epub ahead of print]
Evolution, safety and efficacy of targeted temperature management after paediatric cardiac arrest.
Scholefield BR1, Morris KP2, Duncan HP2, Perkins GD3, Gosney J2, Skone R2, Sanders V2, Gao F4.
Abstract
BACKGROUND:
It is unknown whether targeted temperature management (TTM) improves survival after paediatric out-of-hospital cardiac arrest (OHCA). The aim of this study was to assess the evolution, safety and efficacy of TTM (32-34°C) compared to standard temperature management (STM) (<38°C).

METHODS:
Retrospective, single centre cohort study. Patients aged >one day up to 16 years, admitted to a UK Paediatric Intensive Care Unit (PICU) after OHCA (January 2004 to December 2010). Primary outcome was survival to hospital discharge; efficacy and safety outcomes included: application of TTM, physiological, haematological and biochemical side effects.
RESULTS:
Seventy three patients were included. Thirty eight patients (52%) received TTM (32-34°C). Prior to ILCOR guidance adoption in January 2007, TTM was used infrequently (4/25; 16%). Following adoption, TTM (32-34°C) use increased significantly (34/48; 71% Chi2 p<0.0001). TTM (32-34°C) and STM (<38°C) groups were similar at baseline. TTM (32-34°C) was associated with bradycardia and hypotension compared to STM (<38°C). TTM (32-34°C) reduced episodes of hyperthermia (>38°C) in the 1st 24hours; however, excessive hypothermia (<32°C) and hyperthermia (>38°C) occurred in both groups upto 72hours, and all patients (n=11) experiencing temperature <32°C died. The study was underpowered to determine a difference in hospital survival (34% (TTM (32-34°C)) vs. 23% (STM (<38°C)); p=0.284). However, the TTM (32-34°C) group had a significantly longer PICU length of stay.
CONCLUSIONS:
TTM (32-34°C) was feasible but associated with bradycardia, hypotension, and increased length of stay in PICU. Temperature <32°C had a universally grave prognosis. Larger studies are required to assess effect on survival.

La hipotèrmia a 33ºC dismiueix el consum energètic en repós d'un 20%.

Crit Care. 2015 Mar 29;19(1):128. [Epub ahead of print]
Resting energy expenditure and substrate oxidation rates correlate to temperature and outcome after cardiac arrest- a prospective observational cohort study.
Holzinger U1, Brunner R2, Losert H3, Fuhrmann V4, Herkner H5, Madl C6, Sterz F7, Schneeweiß B8.
Abstract
INTRODUCTION:
Targeted temperature management improves outcome after cardiopulmonary resuscitation. Reduction of resting energy expenditure might be one mode of action. Aim of this study was to correlate resting energy expenditure and substrate oxidation rates with targeted temperature management at 33°C and outcome in patients after cardiac arrest.
METHODS:
This prospective, observational cohort study was performed at the department of emergency medicine and a medical intensive care unit of a university hospital. Patients after successful cardiopulmonary resuscitation undergoing targeted temperature management at 33°C for 24 hours with subsequent rewarming to 36°C and standardized sedation, analgesic and paralytic medication were included. Indirect calorimetry was performed 5 times within 48 h after cardiac arrest. Measurements were correlated to outcome with repeated measures ANOVA, linear and logistic regression analysis.
RESULTS:
In 25 patients resting energy expenditure decreased 20 (18-27) % at 33°C compared to 36°C without differences between outcome groups (favourable vs. unfavourable: 25 (21-26) vs. 21 (16-26); p = 0.5). In contrast to protein oxidation rate (favourable vs. unfavourable: 35 (11-68) g/day vs. 39 (7-75) g/day, p = 0.8) patients with favourable outcome had a significantly higher fat oxidation rate (139 (104-171) g/day vs. 117 (70-139) g/day, $p < 0.05$) and a significantly lower glucose oxidation rate (30 (-34-88) g/day vs. 77 (19-138) g/day; $p < 0.05$) as compared to patients with unfavourable neurological outcome.
CONCLUSIONS:

Targeted temperature management at 33°C after cardiac arrest reduces REE by 20% compared to 36°C. Glucose and fat oxidation rates differ significantly between patients with favourable and unfavourable neurological outcome.

La hipotèrmia s'associa a una major supervivència…

Crit Care. 2013 Jul 23;17(4):R147. doi: 10.1186/cc12826.
Factors predicting the use of therapeutic hypothermia and survival in unconscious out-of-hospital cardiac arrest patients admitted to the ICU.
Lindner TW, Langørgen J, Sunde K, Larsen AI, Kvaløy JT, Heltne JK, Draegni T, Søreide E.
Abstract
INTRODUCTION:
Therapeutic hypothermia (TH) after out-of-hospital cardiac arrest (OHCA) was adopted early in Norway. Since 2004 the general recommendation has been to cool all unconscious OHCA patients treated in the intensive care unit (ICU), but the decision to cool individual patients was left to the responsible physician. We assessed factors that were associated with use of TH and predicted survival.

METHOD:
We conducted a retrospective observational study of prospectively collected cardiac arrest and ICU registry data from 2004 to 2008 at three university hospitals.

RESULTS:
A total of 715 unconscious patients older than 18 years of age, who suffered OHCA of both cardiac and non-cardiac causes, were included. With an overall TH use of 70%, the survival to discharge was 42%, with 90% of the survivors having a favourable cerebral outcome. Known positive prognostic factors such as witnessed arrest, bystander cardio pulmonary resuscitation (CPR), shockable rhythm and cardiac origin were all positive predictors of TH use and survival. On the other side, increasing age predicted a lower utilisation of TH: Odds Ratio (OR), 0.96 (95% CI, 0.94 to 0.97); as well as a lower survival: OR 0.96 (95% CI, 0.94 to 0.97). Female gender was also associated with a lower use of TH: OR 0.65 (95% CI, 0.43 to 0.97); and a poorer survival: OR 0.57 (95% CI, 0.36 to 0.92). After correcting for other prognostic factors, use of TH remained an independent predictor of improved survival with OR 1.91 (95% CI 1.18-3.06; P <0.001). Analysing subgroups divided after initial rhythm, these effects remained unchanged for patients with shockable rhythm, but not for patients with non-shockable rhythm where use of TH and female gender lost their predictive value.

CONCLUSIONS:
Although TH was used in the majority of unconscious OHCA patients admitted to the ICU, actual use varied significantly between subgroups. Increasing age predicted both a decreased utilisation of TH as well as lower survival. Further, in patients with a shockable rhythm female gender predicted both a lower use of TH and poorer survival. Our results indicate an underutilisation of TH in some subgroups. Hence, more research on factors affecting TH use and the associated outcomes in subgroups of post-resuscitation patients is needed.

Sobre el valor pronòstic del TAC craneal en els supervivents d'una ACR

Resuscitation. 2015 Apr 13. pii: S0300-9572(15)00148-3. doi: 10.1016/j.resuscitation.2015.03.023. [Epub ahead of print]
Prognostic value of reduced discrimination and oedema on cerebral computed tomography in a daily clinical cohort of out-of-hospital cardiac arrest patients.

Langkjær S1, Hassager C1, Kjaergaard J1, Salam I1, Thomsen JH1, Lippert FK2, Wanscher M3, Køber L1, Nielsen N4, Søholm H5.

Abstract

PURPOSE:

Assessment of prognosis after out-of-hospital cardiac arrest (OHCA) is challenging. Cerebral Computed Tomography (cCT) scans are widely available, but the use in prognostication of comatose OHCA-patients is unclear. We evaluated the prognostic value of cCT in a clinical cohort of OHCA-patients.

METHOD:

A total of 1,120 consecutive OHCA-patients with cardiac aetiology and successful or on-going resuscitation at hospital arrival were included (2002-2011). Utstein-criteria for registration of pre-hospital data and review of patient-charts for post-resuscitation care including cCT results were used. The primary endpoint was 30-day mortality analysed by log-rank and multivariate Cox-regression analyses.

RESULTS:

A cCT scan was performed in 341(30%) of the clinical OHCA-cohort, and an early CT (<24h) was performed in 188 patients. The early CT was found 'normal' in 163(89%) and with reduced discrimination in 7(4%) of patients, which was independently associated with higher 30-day mortality compared with OHCA-patients with an early cCT (HR adjusted=3.5 (95%CI: 1.0-11.5), p=0.04). A late CT (≥24h) was performed in 153 patients in a median of 3 days (IQR: 2-5) and was 'normal' in 89(60%), 'cerebral bleeding' in 4(3%), 'new cerebral infarction' in 10(7%), and 'reduced discrimination between white and grey matter and/or oedema' in 45(30%) patients. 'Reduced discrimination and/or oedema' by late cCT was independently associated with higher 30-day mortality compared to patients with a normal late CT (HRadjusted=2.6 (95%CI: 1.4-4.8, p=0.002).

CONCLUSION:

Our observations suggest that a cCT may be useful as part of the neurological prognostication in patients with OHCA. 'Reduced discrimination between white and grey matter and/or oedema' on cCT was independently associated with a poor prognosis.

El Pro-BNP no sembla ser un marcador pronòstic a les ACR recuperades.

BMC Anesthesiol. 2015 Apr 9;15:48. doi: 10.1186/s12871-015-0023-y. eCollection 2015.

NT-proBNP in cardiopulmonary resuscitated patients treated with mild therapeutic hypothermia is not independently associated with mortality: a retrospective observational study.

Smit B1, Spoelstra-de Man AM1, Girbes AR1, de Waard MC1.

Abstract

BACKGROUND:

In spite of the introduction of mild therapeutic hypothermia (MTH), mortality rates remain high in patients with return of spontaneous circulation (ROSC) after cardiac arrest (CA). To date, no accurate and independent biomarker to predict survival in these patients exists. B-type natriuretic peptide (BNP) was found to provide both prognostic and diagnostic value in various cardiovascular diseases, including survival to hospital discharge in patients with ROSC. However, the biologically inactive counterpart of BNP, NT-proBNP, was found to be a more stable and accurate analyte. The current retrospective observational study investigates the value of NT-proBNP to predict 28-day mortality in post-CA patients treated with MTH, as well as the dynamics of NT-proBNP during MTH.

METHODS:

NT-proBNP levels were measured in post-CA patients cooled via cold intravenous saline infusion and water-circulating body wraps (Medi-Therm®, Gaymar). Plasma samples were

obtained before cooling was started, at the start and end of the maintenance phase and at the end of rewarming.
RESULTS:
250 patients, admitted between 2009 and 2013, had NT-proBNP levels measured on ICU admission and were included for the evaluation of NT-proBNP as a prognostic marker. In the 28 days following ICU admission, 114 patients died (46%). Non-survivors had significantly higher NT-proBNP (median 1448 ng/l, IQR 366-4623 vs median 567 ng/1, IQR 148-1899; $P < 0.001$) levels on ICU admission. Unadjusted odds ratios for 28-day mortality were 1.7 (95% CI 0.8-3.5), 1.6 (0.8-3.3) and 3.6 (1.7-7.5) for increasing quartiles of NT-proBNP as compared to the lowest quartile. Adjusted odds ratios were 1.1 (95% CI 0.5-2.5), 1.1 (0.5-2.5) and 1.6 (0.7-3.8), respectively. A cut-off value of 834 ng/l achieved a sensitivity of 58% and a specificity of 58% to predict 28-day mortality. Of 113 patients, NT-proBNP values of each MTH phase were available and grouped in decreased or increased levels in time. Both decreases and increases of NT-proBNP values were observed during the MTH phases, but presence of either was not associated with outcome.
CONCLUSIONS:
High NT-proBNP plasma concentrations on ICU admission are associated with high 28-day mortality in post-CA patients treated with MTH in a univariate analysis, but not in a multivariate analysis. Increases or decreases of NT-proBNP levels during MTH appear unrelated to 28 day mortality.

Un nou protocol per avaluar la hipotèrmia vs normotèrmia als ritmes no DF.

Scand J Trauma Resusc Emerg Med. 2015 Mar 7;23(1):26. doi: 10.1186/s13049-015-0103-5.
Therapeutic hypothermia after nonshockable cardiac arrest: the HYPERION multicenter, randomized, controlled, assessor-blinded, superiority trial.
Lascarrou JB1, Meziani F2, Le Gouge A3,4, Boulain T5, Bousser J6, Belliard G7, Asfar P8, Frat JP9, Dequin PF10, Gouello JP11, Delahaye A12, Hssain AA13, Chakarian JC14, Pichon N15, Desachy A16, Bellec F17, Thevenin D18, Quenot JP19, Sirodot M20, Labadie F21, Plantefeve G22, Vivier D23, Girardie P24, Giraudeau B25,26, Reignier J27; Clinical Research in Intensive Care and Sepsis (CRICS) Group and the HYPERION Study Group.
Abstract
BACKGROUND:
Meta-analyses of nonrandomized studies have provided conflicting data on therapeutic hypothermia, or targeted temperature management (TTM), at 33°C in patients successfully resuscitated after nonshockable cardiac arrest. Nevertheless, the latest recommendations issued by the International Liaison Committee on Resuscitation and by the European Resuscitation Council recommend therapeutic hypothermia. New data are available on the adverse effects of therapeutic hypothermia, notably infectious complications. The risk/benefit ratio of therapeutic hypothermia after nonshockable cardiac arrest is unclear.
METHODS:
HYPERION is a multicenter (22 French ICUs) trial with blinded outcome assessment in which 584 patients with successfully resuscitated nonshockable cardiac arrest are allocated at random to either TTM between 32.5 and 33.5°C (therapeutic hypothermia) or TTM between 36.5 and 37.5°C (therapeutic normothermia) for 24 hours. Both groups are managed with therapeutic normothermia for the next 24 hours. TTM is achieved using locally available equipment. The primary outcome is day-90 neurological status assessed by the Cerebral Performance Categories (CPC) Scale with dichotomization of the results (1 + 2 versus 3 + 4 + 5). The primary outcome is assessed by a blinded psychologist during a semi-structured telephone interview of the patient or next of kin. Secondary outcomes are day-90 mortality, hospital mortality, severe adverse events, infections, and neurocognitive performance. The planned sample size of 584 patients will enable us to detect a 9% absolute difference in day-90

neurological status with 80% power, assuming a 14% event rate in the control group and a two-sided Type 1 error rate of 4.9%. Two interim analyses will be performed, after inclusion of 200 and 400 patients, respectively.
DISCUSSION:
The HYPERION trial is a multicenter, randomized, controlled, assessor-blinded, superiority trial that may provide an answer to an issue of everyday relevance, namely, whether TTM is beneficial in comatose patients resuscitated after nonshockable cardiac arrest. Furthermore, it will provide new data on the tolerance and adverse events (especially infectious complications) of TTM at 32.5-33.5°C.

Sobre on mirar la Tª quan fem hipotèrmia…

J Emerg Med. 2015 Apr 13. pii: S0736-4679(14)01447-4. doi: 10.1016/j.jemermed.2014.12.059. [Epub ahead of print]
Difference Between Bladder and Esophageal Temperatures in Mild Induced Hypothermia.
Markota A1, Palfy M2, Stožer A3, Sinkovič A4.
Abstract
BACKGROUND:
Mild induced hypothermia is an established treatment strategy for comatose survivors of cardiac arrest. The goal of the induction phase of mild induced hypothermia is to cool the patient's core body temperature to 32°-34°C.
OBJECTIVE:
The main goal of this study was to compare temperature changes measured in the esophagus and urinary bladder in survivors of cardiac arrest undergoing mild induced hypothermia using cold saline infusion.
METHODS:
We performed a prospective study in a 12-bed adult medical intensive care unit at a tertiary level hospital in comatose adult survivors of nontraumatic cardiac arrest admitted from January to April 2012. Paired temperature readings from bladder and esophageal probes were recorded every 5 min for 95 min (20 readings). Cold fluid infusion was terminated when the measured temperature from either of the probes reached 33.9°C. Factorial repeated-measures analysis of variance was used to determine the effect of time and site of measurement on temperature readings.
RESULTS:
Measurements were performed in 8 patients. Target temperature was achieved in 33 ± 15 min in the esophagus and in 63 ± 15 min in the bladder ($p = 0.006$). We discovered a significant interaction effect ($p < 0.001$) between time and site of measurement, indicating that temperature changes differently depending on the site of measurement, with esophageal temperatures decreasing faster than temperatures measured in urinary bladder.
CONCLUSIONS:
Our results indicate that esophageal temperature measurements show a faster response rate compared to temperature measured in the bladder when cold saline infusion is used to induce mild hypothermia.

Tant se val com refredem els pacients, el pronòstic és el mateix, els refredem amb tènciques de superfície o amb tècniques intravasculars.

Crit Care. 2015 Mar 16;19(1):85. doi: 10.1186/s13054-015-0819-7.
An observational study of surface versus endovascular cooling techniques in cardiac arrest patients: a propensity-matched analysis.
Oh SH1, Oh JS2, Kim YM3, Park KN4, Choi SP5, Kim GW6, Jeung KW7, Jang TC8, Park YS9, Kyong YY10; Korean Hypothermia Network Investigators.

Abstract
INTRODUCTION:
Various methods and devices have been described for cooling after cardiac arrest, but the ideal cooling method remains unclear. The aim of this study was to compare the neurological outcomes, efficacies and adverse events of surface and endovascular cooling techniques in cardiac arrest patients.
METHODS:
We performed a multicenter, retrospective, registry-based study of adult cardiac arrest patients treated with therapeutic hypothermia presenting to 24 hospitals across South Korea from 2007 to 2012. We included patients who received therapeutic hypothermia using overall surface or endovascular cooling devices and compared the neurological outcomes, efficacies and adverse events of both cooling techniques. To adjust for differences in the baseline characteristics of each cooling method, we performed one-to-one matching by the propensity score.
RESULTS:
In total, 803 patients were included in the analysis. Of these patients, 559 underwent surface cooling, and the remaining 244 patients underwent endovascular cooling. In the unmatched cohort, a greater number of adverse events occurred in the surface cooling group. Surface cooling was significantly associated with a poor neurological outcome (cerebral performance category 3-5) at hospital discharge (p = 0.01). After propensity score matching, surface cooling was not associated with poor neurological outcome and hospital mortality [odds ratio (OR): 1.26, 95% confidence interval (CI): 0.81-1.96, p = 0.31 and OR: 0.85, 95% CI: 0.55-1.30, p = 0.44, respectively]. Although surface cooling was associated with an increased incidence of adverse events (such as overcooling, rebound hyperthermia, rewarming related hypoglycemia and hypotension) compared with endovascular cooling, these complications were not associated with surface cooling using hydrogel pads.
CONCLUSIONS:
In the overall matched cohort, no significant difference in neurological outcomes and hospital morality was observed between the surface and endovascular cooling methods.

OXIMETRIA CEREBRAL

Molt interesant, l'oximetria cerebral augmenta abans de la ROSC.

Crit Care. 2015 Mar 24;19(1):112. doi: 10.1186/s13054-015-0837-5.
Increase in cerebral oxygenation during advanced life support in out-of-hospital patients is associated with return of spontaneous circulation.
Genbrugge C1,2, Meex I3,4, Boer W5, Jans F6,7, Heylen R8, Ferdinande B9, Dens J10,11, De Deyne C12,13.
Abstract
INTRODUCTION:
By maintaining sufficient cerebral blood flow and oxygenation, the goal of cardiopulmonary resuscitation (CPR) is to preserve the pre-arrest neurological state. To date, cerebral monitoring abilities during CPR have been limited. Therefore, we investigated the time-course of cerebral oxygen saturation values (rSO2) during advanced life support in out-of-hospital cardiac arrest. Our primary aim was to compare rSO2 values during advanced life support from patients with return of spontaneous circulation (ROSC) to patients who did not achieve ROSC.
METHODS:
We performed an observational study to measure rSO2 using Equanox™ (Nonin, Plymouth, MI) from the start of advanced life support in the pre-hospital setting.
RESULTS:

rSO2 of 49 consecutive out-of-hospital cardiac arrest patients were analyzed. The total increase from initial rSO2 value until two minutes before ROSC or end of advanced life support efforts was significantly larger in the group with ROSC 16% (9 to 36) compared to the patients without ROSC 10% (4 to 15) (P = 0.02). Mean rSO2 from the start of measurement until two minutes before ROSC or until termination of advanced life support was higher in patients with ROSC than in those without, namely 39% ± 7 and 31% ± 4 (P = 0.05) respectively.
CONCLUSIONS:
During pre-hospital advanced life support, higher increases in rSO2 are observed in patients attaining ROSC, even before ROSC was clinically determined. Our findings suggest that rSO2 could be used in the future to guide patient tailored treatment during cardiac arrest and could therefore be a surrogate marker of the systemic oxygenation state of the patient.

ECOGRAFIA

La eco pot ser útil durant la RCP ajudant-nos a descartar causes reversibles, sense interferir en la pròpia RCP.

Resuscitation. 2015 Apr 16. pii: S0300-9572(15)00149-5. doi: 10.1016/j.resuscitation.2015.03.024. [Epub ahead of print]
Echocardiography for prognostication during the resuscitation of intensive care unit patients with non-shockable rhythm cardiac arrest.
Flato UA1, Paiva EF2, Carballo MT3, Buehler AM3, Marco R4, Timerman A5.
Abstract
AIM:
Transthoracic echocardiography (TTE) during cardiopulmonary arrest (CPA) has been studied in victims of cardiac arrests. Our objective was to evaluate the feasibility and usefulness of TTE in victims of cardiac arrest with non-shockable rhythms hospitalized in intensive care units (ICUs).
METHODS:
This prospective and observational cohort study evaluated ICU patients with CPA in asystole or pulseless electrical activity (PEA). Intensivists performed TTE during intervals of up to 10seconds as established in the treatment protocol. Myocardial contractility was defined as intrinsic movement of the myocardium coordinated with cardiac valve movement. PEA without contractility was classified as electromechanical dissociation (EMD), and with contractility as pseudo-EMD. The images, the rates of return of spontaneous circulation (ROSC) and the survival upon hospital discharge and after 180 days were evaluated.
RESULTS:
A total of 49 patients were included. Image quality was considered adequate in all cases and contributed to the diagnosis of CPA in 51.0% of the patients. Of the 49 patients included, 17 (34.7%) were in asystole and 32 (65.3%) in PEA, among which 5 (10.2%) were in EMD and 27 (55.1%) in pseudo-EMD. The rates of ROSC were 70.4% for those in pseudo-EMD, 20.0% for those in EMD, and 23.5% for those in asystole. Survival upon hospital discharge and after 180 days occurred only in patients in pseudo-EMD (22.2% and 14.8%, respectively).
CONCLUSIONS:
TTE conducted during cardiopulmonary resuscitation in ICU patients can be performed without interfering with care protocols and can contribute to the differential diagnosis of CPA and to the identification of a subgroup of patients with better prognosis.

SITUACIONS ESPECIALS

I a Barcelona, sense fibrinolìtic a les ambulàncies (els resultats es podrien aplicar a les ACR extrahospitalàries)…

Tex Heart Inst J. 2015 Apr 1;42(2):136-8. doi: 10.14503/THIJ-14-4267. eCollection 2015.
Prolonged Chest Compressions during Cardiopulmonary Resuscitation for In-Hospital Cardiac Arrest due to Acute Pulmonary Embolism.
Nobre C, Thomas B, Santos L, Tavares J.
Abstract
Patients with hemodynamic collapse due to acute pulmonary embolism have a dismal prognosis if not treated rapidly. Therapeutic options include systemic thrombolytic therapy, rheolytic thrombectomy, and surgical embolectomy. However, the efficacy of thrombolytic therapy is diminished because the low-output state hinders effective delivery of the lytic agent to the thrombus. In the absence of any form of mechanical circulatory support, such as extracorporeal membrane oxygenation or cardiac surgery on site, we think that prolonged vigorous manual compressions might be the only way to support the circulation during the initial critical state, when thrombolytic therapy has been administered. We report the results of prolonged manual chest compressions (exceeding 30 minutes) on 6 patients who received tenecteplase in treatment of acute pulmonary embolism that induced in-hospital cardiopulmonary arrest. Four of 6 patients survived and were discharged from the hospital. In an era of increasing technologic complexity for patients with hemodynamic instability, we emphasize the importance of prolonged chest compressions, which can improve systemic perfusion, counteract the prothrombotic state associated with cardiopulmonary arrest, and give the lytic agent time to act

PEDIATRIA

Una tràgica manera de comprovar quina tècnica de RCP és millor en un nen petit.

Scand J Trauma Resusc Emerg Med. 2013 Jul 2;21:51. doi: 10.1186/1757-7241-21-51.
Association of arterial blood pressure and CPR quality in a child using three different compression techniques, a case report.
Sainio M, Sutton RM, Huhtala H, Eilevstjønn J, Tenhunen J, Olkkola KT, Nadkarni VM, Hoppu S.
Abstract
A 2-year-old boy found in cardiac arrest secondary to drowning received standard CPR for 35 minutes and was transported to a tertiary hospital for rewarming from hypothermia. Chest compressions in hospital were started using two-thumb encircling hands technique. Subsequently two-thumbs direct sternal compression technique and after sternal force/depth sensor placement, chest compression with classic one-hand technique were done. By using CPR recording/feedback defibrillator, quantitative CPR quality data and invasive arterial pressures were available for analyses for 5 hours and 35 minutes. 316 compressions with the two-thumb encircling hands technique provided a mean (SD) systolic arterial pressure (SAP) of 24 (4) mmHg, mean arterial pressure (MAP) 18 (3) and diastolic arterial pressure (DAP) of 15 (3) mmHg. ~6000 compressions with the two thumbs direct compression technique created a mean SAP of 45 (7) mmHg, MAP 35 (4) mmHg and DAP of 30 (3) mmHg. ~20,000 compressions with the sternal accelerometer in place produced SAP 50 (10) mmHg, MAP 32 (5) mmHg and DAP 24 (4) mmHg. Restoration of spontaneous circulation (ROSC) was achieved at the point when the child achieved normothermia by using peritoneal dialysis. Unfortunately, the child died ten hours after ROSC without any signs of neurological recovery. This case demonstrates improved hemodynamic parameters with classic one-handed technique with real-time quantitative quality of CPR feedback compared to either the two-thumbs encircling hands or two-thumbs direct sternal compression techniques. We speculate that the improved arterial

pressures were related to improved chest compression depth when a real-time CPR recording/feedback device was deployed.

CASE REPORT

Un cas per l'Iker Jiménez...

BMC Cardiovasc Disord. 2015 Feb 28;15(1):16.
Synchronous cardiac arrest in monozygotic twins with hypertrophic cardiomyopathy - Is sudden cardiac death genetically pre-programmed?
Goh CY1, Ul Haq MA2,3, Mutha V4,5, van Gaal WJ6,7.
Abstract
BACKGROUND:
Hypertrophic cardiomyopathy (HCM) is a myocardial disorder characterised by left ventricular hypertrophy (LVH) in the absence of another cardiac or systemic disease capable of producing the magnitude of LVH evident. HCM causes variable symptoms and is one of the leading causes of sudden cardiac death (SCD) in young adults. While various phenotypic features of HCM among monozygotic twin pairs are not uncommonly reported, occurrence of synchronous cardiac arrest among them is not known from literature.
CASE PRESENTATION:
We present a case of monozygotic twins with HCM who both had a cardiac arrest post physical exertion in 63rd year of their lives.
CONCLUSION:
This case highlights potential genetics predisposition of cardiac arrest in patients with HCM despite having different phenotypic expression. SCD may be the only manifestation of patients with HCM. Decision of implantable cardioverter-defibrillator (ICD) placement for primary prevention of SCD should be based on the recommended guidelines, clinical judgment and patient's preference.