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Oral Presentations

AS01

Potential of photoplethysmography to guide pulse checks during cardiopulmonary resuscitation: Observations in an animal study

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Introduction: Detecting return of spontaneous circulation (ROSC) via palpation during cardiopulmonary resuscitation (CPR) is challenging and often time-consuming, which can negatively impact outcome. Non-invasive ROSC detection could reduce compression pauses and thereby improve outcome. We investigated whether photoplethysmography (PPG) can detect a spontaneous pulse in an automated-CPR (A-CPR) animal study.

Methods: Nasal PPG signals, acquired with a reflectance pulse oximetry probe placed between the nostrils, were recorded in 12 anesthetized pigs, with aortic blood pressure (ABP) as a reference. Ventricular fibrillation was induced, followed by 20 min of 30:2, 100 cpm A-CPR. Subsequently, up to 4 two-min cycles of advanced A-CPR were performed, with medication and defibrillation as appropriate. Retrospectively, PPG and ABP signals were analysed via spectrograms, which show which frequencies were present over time.

Results and discussion: PPG and ABP frequency content resembled strongly throughout the experiments. ROSC was achieved in 9 animals. Before defibrillation, chest compressions caused frequency components at 100 and 200 min^{-1} (second harmonic) in the PPG signal (Fig. 1). After successful defibrillation (Fig. 1a), a spontaneous pulse component could be distinguished from the compression components in the PPG signal. In contrast, after unsuccessful defibrillation (Fig. 1b), no changes occurred during compressions or in the ventilation pauses. This strongly suggests absence of a potentially life-supporting, spontaneous pulse and negates the relevance of a manual pulse check.

Conclusions: PPG has the potential to non-invasively detect the presence or absence of a spontaneous pulse during both chest compressions and ventilation pauses. This could avoid unnecessary pauses for pulse check, which may positively impact outcome.

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AS02

New psychosocial intervention improves quality of life after cardiac arrest: Results of a randomised controlled trial

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Purpose of the study: A cardiac arrest can lead to hypoxic–ischaemic brain injury and cognitive and emotional problems are common. Furthermore, survivors often have a decreased participation in society and a lower quality of life. We developed a new and concise psychosocial intervention directed at early detection of cognitive and emotional problems and provision of relevant information and support. The goal of this study was to evaluate the effect of this intervention on participation in society and quality of life of survivors of a cardiac arrest.

Materials and methods: Multicentre single blind randomised controlled trial with baseline measurements 2 weeks after the cardiac arrest and follow up measurements at 3 and 12 months. Primary outcome measures were the extent of participation in society (Community Integration Questionnaire) and quality of life (SF-36 and EuroQol VAS) one year after a cardiac arrest. Secondary