23 MACHINE LEARNING MODEL SURPASSING MEDICAL DISPATCHERS RECOGNITION OF OUT-OF-HOSPITAL CARDIAC ARREST

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Aim The chance of surviving Out-of-Hospital Cardiac Arrest (OHCA) is highly correlated with medical dispatchers' recognition of the condition during emergency calls.[1,2] We investigated if machine learning (ML) could surpass medical dispatchers by applying ML directly on the realtime dialogue between the caller and the dispatcher.

Method We retrieved all 1 61 650 emergency calls recorded for 2014 to the Emergency Medical Dispatch Centre Copenhagen (EMDC). From the Danish Cardiac Arrest Register (DCAR) and audit of callrecordings where resuscitative efforts were begun, we extracted information on all OHCA in 2014. Emergency medical services (EMS) witnessed cardiac arrests and damaged audiofiles/recordings were excluded. The data-set for analysis contained henceforth 1 58 330 non-OHCA calls and 2,157 OHCA calls. Each OHCA could span several calls from multiple callers. Time-to-recognition by the ML-Model was calculated for each call and for the dispatchers found by auditing all OHCA calls.

Results The ML-Model reached a sensitivity of 93.1% (95% CI: 91.9 to 94.1) and a specificity of 98.0%. (95% CI: 97.9 to 98.1) on OHCA-calls. Sensitivity of the dispatchers was 72.9% (95% CI: 70.0 to 75.6). Specificity is unknown for dispatchers, as false positives are not registered. Time-to-recognition was significantly shorter for the ML-model (mean time-to-recognition 00:48 mm:ss, 95% CI: 00:46 to 00:50) compared to dispatchers (mean time-to-recognition 01:19 mm:ss, 95% CI: 01:13 to 01:25) ($p<0.0001$).

Conclusion In recordings of 1 61 650 calls to EMDC a ML-model could recognise a higher proportion of OHCA, compared to medical dispatchers. Furthermore, we found that the ML-model was significantly faster in recognising OHCA.

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24 INJURIES FOLLOWING MECHANICAL CARDIAC MASSAGE WITH A PISTON-TYPE DEVICE

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Aim Chest injuries and abdominal injuries as a result of vigorous cardiac compression have caused concern ever since manual cardiopulmonary resuscitation was introduced.[1] The same concerns have now been expressed in relation to mech-CPR.[2,3] The aim of this study was to investigate injury patterns related to mech-CPR in comparison to manual CPR.

Method During a study period of 15 months, a convenience sample of all patients treated with chest compressions (CC) by the Odense MECU as well as all patients in the Region of Southern Denmark treated with mech-CPR was assessed. Pre-hospital discharge reports, in-hospital records, and autopsy reports were manually reviewed for indications of injuries related to CC.

Results We included 75 patients receiving mech-CPR and 234 patients receiving manual CPR. The crude analysis showed that mech-CPR posed a significantly higher risk of injuries than manual CPR ($p<0.001$, Odds-Ratio 3.31, CI: 1.91 to 5.74). When adjusted for duration of CPR this difference waned. Mech-CPR significantly increased the likelihood of soft tissue injuries compared with manual CPR alone. This difference was significant both in a crude analysis and adjusted for duration, age, gender, BMI and anticoagulant therapy (Odds-Ratio 31.87 (CI: 5.82 to 172.83 ($p<0.001$)). Furthermore, the occurrence of injuries was associated with duration of CC regardless of mech-CPR or manual CPR (Odds-Ratio 1.02 (CI: 1.00 to 1.04 ($p=0.02$)).

Conclusion Mech-CPR was strongly associated with soft tissue injuries. Prolonged duration of CPR was associated with increased prevalence of injuries. This finding may have implications for future on-scene treatment of patients in cardiac arrest.

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25 EFFECT OF INSTRUCTOR'S REAL-TIME FEEDBACK USING QCPR-CLASSROOM DEVICE DURING LAYPERSON CARDIOPULMONARY RESUSCITATION (CPR) TRAINING ON QUALITY OF CPR PERFORMANCES: A PROSPECTIVE CLUSTER-RANDOMISED TRIAL

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Aim The evidence supporting delivery of quality cardiopulmonary resuscitation (CPR) is growing and significant attention has been focused on improving CPR education among laypersons perform bystander CPR. The aim of this randomised trial was to assess the effectiveness of instructor's real-time objective feedback during CPR training compared to conventional feedback in terms of trainee's CPR quality.