



Machine learning tool to recognise cardiac arrest in emergency calls



Emergency medical dispatchers fail to identify approximately 25% of cases of out of hospital cardiac arrest, thus lose the opportunity to provide the caller instructions in cardiopulmonary resuscitation. This study examined whether a machine learning framework could recognize out-of-hospital cardiac arrest from audio files of calls to the emergency medical dispatch center.

For all incidents responded to by Emergency Medical Dispatch Center Copenhagen in 2014, the associated call was retrieved. A machine learning framework was trained to recognize cardiac arrest from the recorded calls. Sensitivity, specificity, and positive predictive value for recognizing out-of-hospital cardiac arrest were calculated. The performance of the machine learning framework was compared to the actual recognition and time-to-recognition of cardiac arrest by medical dispatchers.

108,607 emergency calls were examined, of which 918 (0.8%) were out-of-hospital cardiac arrest calls eligible for analysis. Compared with medical dispatchers, the machine learning framework had a significantly higher sensitivity (72.5% vs. 84.1%, $p < 0.001$) with lower specificity (98.8% vs. 97.3%, $p < 0.001$). The machine learning framework had a lower positive predictive value than dispatchers (20.9% vs. 33.0%, $p < 0.001$). Time-to-recognition was significantly shorter for the machine learning framework compared to the dispatchers (median 44 seconds vs. 54 s, $p < 0.001$).

A machine learning framework performed better than emergency medical dispatchers for identifying out-of-hospital cardiac arrest in emergency phone calls. Machine learning may play an important role as a decision support tool for emergency medical dispatchers.

Source: [Resuscitation](#)

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