

Peripheral Oxygen Saturation as a Feature for Detecting Acute Myocardial Infarction Using a Wrist-Worn Device

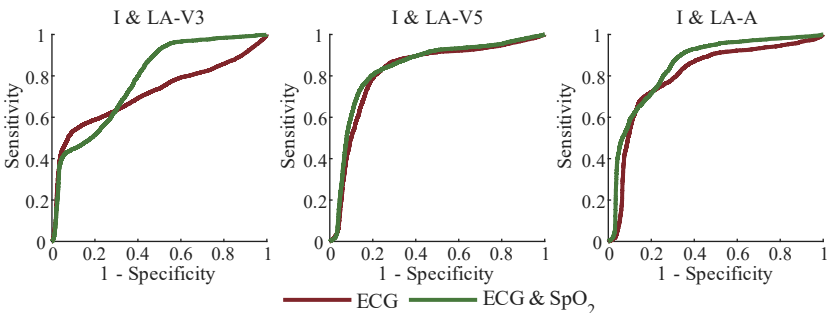
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A wrist-worn device capable of acquiring limb and chest ECG leads with a single touch offer a promising approach to detecting acute myocardial infarction (AMI) outside the hospital. The present study investigated whether peripheral oxygen saturation (SpO_2) can improve AMI detection performance when combined with ECG-based features.

A wrist-worn device equipped with three electrodes was used to acquire two ECG leads: limb lead I and a second lead between the left arm (LA) and a specific body site, namely, the precordial positions V3 and V5 or the abdomen (A). The study included 111 participants, comprising patients with AMI, patients with other cardiovascular diseases, and healthy controls. Finger SpO_2 was obtained simultaneously using a pulse oximeter. AMI was detected using a gradient-boosted decision tree based on ECG features alone and on ECG features combined with SpO_2 .

Adding SpO_2 increased the area under the ROC curve for all lead configurations, from 0.72 to 0.78 for I & LA-V3, from 0.82 to 0.84 for I & LA-V5, and from 0.80 to 0.85 for I & LA-A. However, SpO_2 provided little value for distinguishing AMI from other cardiovascular diseases.



ROC curves for each lead configuration

This study suggests that SpO_2 may improve AMI detection performance, although its utility should be confirmed in a fully wrist-based implementation.