Comparison of vest-recorded electrocardiogram versus conventional electrocardiogram concerning ST-deviation in acute coronary syndrome

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Background and Aim: With the 12 lead ECG being the cornerstone in the diagnosis of ACS Development of a home-based, user-friendly recording of a 12 lead ECG will be a breakthrough in combating delay in diagnosing Acute Coronary Syndrome (ACS). This study evaluates the potential of a wearable vest 12-lead ECG (V-ECG) compared with the gold standard, conventional 12-lead ECGs (C-ECG) in diagnosing ACS.

Methodology: A prospective single-centre observational study conducted in a tertiary care centre. C-ECG and wearable V-ECG were recorded in hemodynamically stable adult patients and patients with normal ECG. The location of the electrodes in the vest included ten specific torso positions. Two independent physicians interpreted all the ECGs in a blinded fashion.

Results: Out of 241 patients, the vest fitted 236 patients (97.9%). Among 234 patients (72.5% males, 27.5% females; mean age 57.5 years), 154 had ACS. Three patients had an additional set of ECGs recorded, given their dynamic ECG changes during hospitalisation. The sensitivity and specificity of V-ECG, compared with the gold standard C-ECG for the diagnosis of ACS, were 98.7% (CI 95.36-99.77) and 96.5% (CI 90.2-99.1), respectively. Among patients with STEMI, the sensitivity of V-ECG went up to 100% (CI 95.9-100). V-ECG has correctly identified anterior and inferior STEMI patients with 100% accuracy.

Conclusion: 12 lead ECG recording by a wearable garment using novel torso positions is feasible in the vast majority, including both genders, and reasonably accurate for diagnosing ACS.

Highlights: Commercial availability of this vest might enable an otherwise lay person to record an ECG in an out-of-hospital setting (even at home), thus leading to an expedited diagnosis of ACS and saving precious time and lives.