

00111 Validating the Heart Rate Variability Risk Prediction Model and Accelerated Diagnostic Protocol (HRVPM-ADP) for Chest Pain Patients at the Emergency Department

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Aims: Patients with chest pain can present to the emergency department (ED) with a myriad of symptoms. It is essential for ED doctors to ensure that each patient is appropriately triaged, treated, and discharged in a time - and cost - saving manner. The HRVPM - ADP was previously derived as a non - invasive, standalone risk stratification tool for chest pain with an aim to safely discharge low risk patients. We aimed to externally validate this novel triage method and compare it against the HEART, TIMI, and GRACE scores.

Methodology: We retrospectively analysed 545 chest pain patients presenting to the Singapore General Hospital between 2014 and June 2016. The primary outcome was 30 - day major adverse cardiac events (MACE).

The HRV - based risk prediction model (HRVPM) was previously derived and encompassed the following parameters: 6 HRV variables (triangular interpolation of normal - to - normal variables, total power, very low/low/high frequency powers, approximate entropy) and 3 ECG variables (ST - elevation, ST depression, Q - wave). Troponin results were then added to develop an accelerated diagnostic protocol (HRVPM - ADP). Performance of the HRVPM - ADP was validated and compared against the three aforementioned scores.

Result: HRVPM performance of 30 - day MACE prediction had an AUC of 0.711 (95%CI 0.659,0.763). This outperforms HEART with AUC 0.708 (95% CI 0.658,0.758) even prior to addition of troponin. Adding troponin increased AUC to 0.716 (95%CI 0.664,0.767). HRVPM - ADP identified chest pain early for discharge with a sensitivity of 98.5% (95%CI 96,100), and Negative Predictive Value (NPV) of 96.0% (95%CI 89,100). In comparison, a low risk HEART score (0 - 3) had a lower NPV of 92.7% (95%CI 85,97), and specificity of 28.8% (95% CI 0.239,0.343).

Conclusion: HRVPM is a non - invasive risk stratification tool which demonstrates comparable performance with the HEART, and can be used as an ADP to identify chest pain patients in the ED who are safe for early discharge. We intend to develop HRVPM - ADP to include further cut - offs for risk stratification in the future.