Heart rate turbulence for predicting cardiovascular death in patients undergoing coronary artery bypass grafting

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Introduction: Coronary artery disease (CAD) is a major cause of death and disability in developed countries. Coronary artery bypass graft (CABG) is used for myocardial revascularization in patients with severe CAD. Heart rate turbulence, a noninvasive electrocardiographic measure of cardiac autonomic function, has been shown to predict the risk of cardiovascular death or sudden cardiac death after myocardial infarction. However, no prospective study has described the prognostic value of HRT parameters for predicting cardiovascular death in patients undergoing CABG surgery.

Methods: From May 2010 to Dec 2017 in Samsung Medical center, we prospectively enrolled 212 consecutive patients who underwent elective CABG surgery. Patients who met any of the following criteria were excluded from the analysis: 1) urgent/emergent surgery; 2) HRT examination was not feasible; 3) pre-existing (permanent, persistent, or paroxysmal); 4) pacemaker rhythm prior to CABG. Patients were divided into 2 groups according to TWA value. The primary outcome of this study was cardiovascular mortality. The secondary endpoint was all-cause death, stroke, sustained ventricular tachycardia (VT), ventricular fibrillation (VF) and composite of cardiovascular death, stroke.

Result: The mean age of the 167 patients was 63 (49-65) years and the proportion of male patients was 73% (123/167). Preoperative median values (IQR) for TO and TS were 0.48% (1.43% to 0.32%) and 3.52 (1.86 to 8.11) ms/RR interval, respectively. Primary outcomes occurred in 3 (5.4%) of HRT0 group, 5 (5.7%) of HRT1 group, 5 (31.2%) of HRT2 group. (p<0.01)

Conclusion: Preoperative abnormal TWA was significantly associated with cardiovascular mortality after CABG.