

Dynamic Changes in Electrocardiographic Findings Between Initial and Second Electrocardiography

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Background/Aims: Dynamic changes in the electrocardiographic findings between the initial and second electrocardiogram (ECG) have rarely been investigated in patients who were suspected of acute coronary syndrome (ACS). Thus, we aimed to determine whether changes in staple variables on ECG including depression of ST segment, inversion of T wave, and the ratio of T amplitude / QRS amplitude (T/QRS ratio), can assist in distinguishing between coronary artery disease (CAD), heart failure, and neuropsychiatric or gastrointestinal disorders (mild disorders).

Methods: This retrospective study enrolled 1279 patients who presented with acute chest pain, were diagnosed with CAD, heart failure, and mild disorders, and who underwent echocardiography and coronary angiography (CAG). After performing propensity matching and exclusion, 184 patients were included and analyzed.

Results: As a discriminator of the mild to severe diseases that CAG might be required, maximum change of T/QRS ratio in contiguous 2 leads was superior to maximum change of ST segment depression and T wave inversion in contiguous 2 leads and to the mean change of electrocardiographic variables in anterior, inferior, and lateral leads. Compared with regional wall motion abnormality, change in troponin I per hour, and the maximum change of ST segment depression and T wave inversion, the most deviated T/QRS ratio change from 1 (> 1.5 or < 0.5) in contiguous 2 leads was the most significant discriminator of CAD, heart failure, and mild disorders (standardized $\beta = 0.545$, $p < 0.001$).

Conclusions: The changes of T/QRS ratio in contiguous 2 leads can assist in distinguishing mild to severe diseases incorporating CAD, heart failure, and mild disorders in patients who are suspected of ACS.

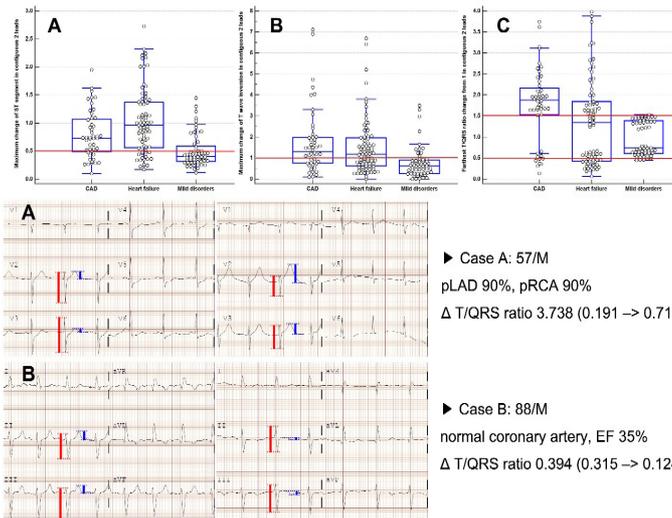


Table 2. Comparison of variables related with mild to severe diseases

Dependent	Independent variable	B	β	t	P	VIF
Mild disorders	Δ mean ST depression in contiguous 2 leads	0.1	0.083	1.364	0.174	1.125
Heart failure	Δ mean T wave inversion in contiguous 2 leads	0.041	0.072	1.177	0.241	1.142
CAD	Maximum deviation of Δ mean T/QRS ratio in contiguous 2 leads (> 1.5 or < 0.5)	0.835	0.545	8.716	< 0.001	1.187
	Δ Troponin I per hour	0.008	0.123	2.13	0.035	1.017
	RWMA	0.243	0.151	2.513	0.013	1.098

Mild disorders denote neuropsychiatric or gastrointestinal disorders; CAD, coronary artery disease.