

## ST segment changes in nodal re-entrant tachycardia - a clinically important issue or just an artefact?

Jakub Mercik<sup>1</sup>, Jadwiga Radziejewska<sup>2</sup>, Katarzyna Pach<sup>3</sup>, Dorota Zyśko<sup>1</sup>, Jacek Gajek<sup>4</sup>

1. Department of Emergency Medicine, Wrocław Medical University, Wrocław, Poland

2. Klodzko County Hospital, Klodzko, Poland

3. Students' Scientific Association, Department of Emergency Medical Service, Wrocław Medical University, Wrocław, Poland

4. Department of Emergency Medical Service, Wrocław Medical University, Wrocław, Poland

### Introduction:

The AV nodal re-entrant tachycardias (AVNRT) usually generate changes of the ST-segment in ECG, in fact usually in the form of ST lowering. Because ST-segment changes are an important indicator of myocardial ischemia, the pathophysiological mechanism is clinically significant, especially in young healthy people in whom typical ischemic etiology is unlikely.

During tachycardia, the individual components of the heart cycle change the distance to each other, the QRS complex approaches the T wave, changing the reference point of the isoelectric line. In addition, the P' wave can affect the QRS complex and ST-segment.

### Methodology and material:

AVNRT patients undergoing electrophysiological study and subsequent RF ablation were selected for the study. The group included 102 pts (F67, M35). All measurements were made in the precordial lead V5. The amplitudes of the QR, RS, RJ waves were measured during normal sinus rhythm and tachycardia. The Wilcoxon test for dependent and U Mann-Whitney for independent samples were used for their comparison, while the Spearman test was used to correlate the changes in amplitude with respect to the heart rate.

### Results:

	Age	Tachycardia (mV)				Sinus Rhythm (mV)				Tachycardia, Cycle (ms)	Sinus Rhythm Cycle (ms)	RS Sinus Rhythm - RS Tachycardia
	Years	QR	RS	RJ	RJ - QR	QR	RS	RJ	RJ - QR			
Average	51,0	0,689	0,938	0,820	0,131	0,718	0,947	0,796	0,077	369,7	739,6	0,009
SD	16,5	0,293	0,369	0,364	0,097	0,300	0,351	0,362	0,077	72,2	179,5	0,187

The degree of ST-depression during tachycardia was particularly related to its short cycle (below 350 vs above 350 ms) - 0,186+/-0.114 vs. 0.093+/-0.060 mV, p<0,001, respectively.

### Conclusions:

The shorter the heart rate, the greater the ST segment depression relative to the increased baseline level caused by the overlap of the QRS complex on the T wave.

With the increase in heart rate difference (especially with a cycle difference of over 400 ms), the heights of the individual components of the QRS complex decrease.

There is a close relationship between the position of J in sinus rhythm and tachycardia - the lower this baseline is, the lower it will be in tachycardia.