THE SIGNIFICANCE OF T-WAVE PSEUDO-NORMALIZATION IN MYOCARDIAL ISCHAEMIA

Besides the variety of the myocardial repolarisation process in general and of the T-wave in particular the electrocardiography phenomenon represented by the T-wave pseudo-normalization (TPN) presently is still considered a controversial subject for experimental and clinical research regarding electrogenesis as well as myocardial ischemia. This study is meant to find a link between previously formulated hypotheses and current efforts to appreciate myocardial viabilities regarding the indication of invasive exploration and eventual benefits achieved through the process of percutaneous myocardial revascularization or coronary by-pass.

Spatial measurements of repolarisation that considered the complexity of T-wave using its vector (axis) proved the utility and accuracy of this surface electrocardiography marker. Different clinical studies demonstrated that the axis of T-wave reflects the modifications associated with adaptive autonomic influences, systemic hypertension and coronary occlusion.

Ischemia alters the process of rapid repolarisation, a new component being locally created - the vector of ischemia – which sums up with the normal vectorial component of the myocardial repolarisation of the adjacent tissues. The result is the occasionally marked deviation of the electric axis of the T-wave, which appears on the electrocardiogram by the alteration of polarity and aspect. When evaluating the significance of positive high ischemic T-waves or of negative T-waves one should take into account that these can also be met beyond ischemic cardiopathy. The diagnosis of negative T-waves as a general rule should be performed in a clinical context (the presence of the thoracic algic syndrome).

TPN - “paradox” transitory regulation (or positive transformation) of negative T-waves can appear in patients with ischemic cardiopathy as much as in those with normal coronaries. Comparative studies through the physical effort test, coronagraphy and PET confirm the fact that TPN is a sensitive and specific indicator which emphases ischemia as well as the presence of postinfarct residual myocardial viabilities.

The aim of this descriptive study performed on a representative sample of 200 patients was the evaluation of the significantce of TPN in establishing a diagnosis, prognosis and therapeutic results in cardiology. The selection of cases was performed based on some incorporation criteria applied to a target population represented by patients with cardiovascular affections, who presented negative T-waves in at least two similar
variations on the registered ECG tracing during their hospitalization (5,112 patients) out of an available population of 20,447 patients hospitalized at the 3rd Medical Clinic of Tg. Mures, Cardiology Clinic and Interventional Cardiology Clinic – The Institute of Cardiovascular Diseases and Transplantation and The Cardiovascular Rehabilitation Clinic between 01.09.2001- 31.08.2006. The collected amount of data was registered in tables, diagrams were made up, statistical data calculated and essential associations were studied to achieve the aim of this study.

There were no significant differences regarding the obtained results by processing data from TNP patients of the four Cardiology Clinics where the sample selection was performed.

From the epidemiologic point of view there was an equal repartition between the two sexes and an average age limit of 60.

The maximum incidence of the studied electrocardiographic phenomenon was registered in patients being diagnosed with stable angina pectoris.

In the studied sample of patients all classical cardiovascular risk factors were present in various associations.

TNP was spontaneously registered as well as undergoing the test of physical effort respecting a similar distribution within the different complementary electrocardiographic derivations.

The occurrence of TNP as a unique electrocardiographic sign or associated to the usual criterion of interpretation of the significance of the physical effort test maintains the correlation with the ischemic and/or anginal threshold limits.

The predictive value of TNP in interpreting the significance of the physical effort test increased at the same time with the clinical criteria (anginal syndrome) and/or with the other electrocardiographic criteria (the modification of segment ST).

It can be established a correspondence between the significance of the achieved results through the three paraclinic exploration methods used in our study for the appreciation of the level of myocardial affection correlated to the ischemic severity and responsible coronary artery.

TNP can appear intermittently during and after the percutaneous procedures of the myocardial revascularization due to transitory ischemic episodes of short duration realized with coronary obstruction by blowing the dilatation probe balloon.

The outcome of the myocardial viability evaluation through consecrated methods of exploration (stress and myocardial contrast ecocardiography, myocardial scintigraphy, positron emission tomography) and the assessment of correlations with results from our
study reported to those given in the speciality literature within the given limits of the technical equipment during the study was not successful.

The comparison with similar studies on national and international scale could not be performed because this phenomenon was studied only in case of limited number of patients suffering from recent myocardial infarct as a marker of the myocardial viability.

The detection of TNP in the postinfarct scar areas seems to be a first line cheap method used for the identification of the coronary microcirculation reserves as well as for the myocardial viability.