QTc Analysis and Comparison in Pre-Diabetic Patients

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QT interval is a surface ECG measure which has being subject of great research interest. Its accurate measure is very relevant as a non-invasive index of cardiac risk. This is of utility for drug toxicity quantification, VF risk assessment; Ischemic cardiopathy as in diabetes mellitus because of the increased difficulty the cells have to metabolize glucose and the related QT prolongation. Usually a prolongation of the QT interval beyond the normal cause is associated with bad prognosis.

It has already been shown that many of the complications that we associate with diabetes appear in the patient in early stages of diabetes, or even before the disease is developed. The aim of this paper, then, is to check whether QTc (corrected with bazett's formula) is altered in these prior stages of diabetes (insulin resistance and/or altered glucose according to the American Diabetes Association) when compared to healthy subjects.

In this paper we revisit the wavelet transform method for delineating the ECG. We use the extreme on the second (third) derivative which first appear ahead of the inflexion point of a T-wave. The algorithm detects Q waves with the first scale of a cuadratic spline WT while detects the end of the T-wave by using the first derivative on the fourth (fifth) scale.

Results were obtained in our database (data acquired in the Ḧospital Clinico Universitario de Valladolid). This database includes 34 healthy subjects and 16 pre-diabetic patients. We found QTc to be 0.3767+/-0.03 seg for healthy subjects and 0.3901+-0.03 seg in the case of prediabetic patients. Even though there is a sligth enlargement of the QT interval in prediabetic respect to healthy subjects, the difference in the values doesn't seem to be of statistical significance.