

Evaluation Of QT Dispersion in Epileptic Patients and its Association with SUDEP Risk

Rehab M. Hamdy a,*, Ola H. Abd Elaziz a, Rasha Sobhy El attar b, Hayam Abdel-Tawab b, Fatma M. Kotb c
a Department of Cardiology, Faculty of Medicine (for girls), Al-Azhar University, Cairo, Egypt
b Department of neurology, Faculty of Medicine (for girls), Al-Azhar University, Cairo, Egypt
c Department of internal Medicine, Faculty of Medicine (for girls), Al-Azhar University, Cairo, Egypt

Background:

Mortality in epileptic patients was attributed to sudden unexpected death in epilepsy (SUDEP). The precise pathophysiology of SUDEP is not fully understood, yet prolongation of ventricular repolarization particularly QTc interval suggested to be one of the contributing risk factor for SUDEP. *Objectives:* We aimed at evaluation of QTc and QT dispersion (QTD) in patients with epilepsy (both refractory and well-controlled epilepsy) and their association with the epileptic severity and sudden unexplained death (SUDEP) risk.

Patients and methods:

The study included eighty epileptic patients (40 controlled epileptic patients and 40 refractory epileptic patients) compared to thirty non-epileptic volunteers as the control group (patients with history of cardiovascular comorbidities or exposure to antiarrhythmic drugs were excluded from the study). All participants were subjected to clinical evaluation including detailed epileptic history with assessment of SUDEP 7 risk, severity scale, 12 leads surface ECG to measure QTc & QTD, 24 h Holter monitoring to assess heart rate variability (HRV) parameters. *Results:* Controlled and refractory epileptic patients demonstrated increased average QTc and QTD values compared to control group (450.1 ± 18.9 vs. 412.3 ± 12.3 ms, $p < 0.0001$, 452.1 ± 19.0 vs. 412.3 ± 12.3 ms, $p < 0.0001$ respectively) (45.6 ± 14.9 vs. 15.4 ± 6.8 ms, $p < 0.001$, 70.6 ± 18.1 vs. 15.4 ± 6.8 ms, $p < 0.0001$ respectively).

Refractory epileptic patients had a significantly higher incidence of abnormal

QTD > 50 ms compared to controlled epileptic patients (32.5% vs. 90%, $p < 0.005$). Refractory epileptic patients with generalized form had significantly higher severity scale in addition to significantly impaired rMSSD and pNN50 compared to those with focal form (1072.7 ± 722.7 vs. 429.1 ± 180.4 , $p < 0.03$, 17.11 ± 4.6 vs. 26.4 ± 7.9 ms, $p < 0.004$ and

2.9 ± 1.8 vs. $7.8 \pm 4.1\%$, $p < 0.003$ respectively).

Among refractory epileptic patients, the duration of epilepsy, rMSSD and QTD significantly correlated with SUDEP-7 risk ($r^2 = 0.199$, $p < 0.005$, $r^2 = 0.623$, $p < 0.0001$ and $r^2 = 0.44$, $p < \dots$ respectively).

Conclusions:

The current study stands out the importance of evaluating QTc and QTD in 12-lead ECG recordings in epileptic patients and signifying their association with SUDEP-7 risk among refractory epileptic patients.