Association of non-alcoholic fatty liver disease with QT prolongation on EKG: A case control retrospective study

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Introduction: Non-alcoholic fatty liver disease (NAFLD) is a leading cause of liver disease in developed countries. Recently, NAFLD association with cardiovascular atherosclerosis was described. The aim of this study was to find whether an association exists between QT prolongation on EKG and NAFLD.

Methods: This is a case control retrospective study of 700 patients (109 patients with QT prolongation, and 591 without QT prolongation) admitted to Orange Park Medical Center, Orange Park from 2009 to 2015. Patients with history of alcohol use, congenital heart disease, infiltrative malignancy and myocarditis were excluded from the study. NAFLD was diagnosed by detection of hepatic steatosis on ultrasound or CT scan. Electrocardiograms were done on all 700 patients and were interpreted by a cardiologist. Univariate logistic regression was used to assess potential risk factors of QT prolongation, and multivariate logistic regression with backward elimination method was performed to determine if NAFLD was independent risk factor for QT prolongation.

Results: Multivariate logistic regression with backward elimination method identified 7 independent risk factors for QT prolongation, these included NAFLD (OR 4.33; 95% CI 2.40-7.80, p<0.0001), St change (OR 3.16; 95% CI 1.92-5.20, p<0.0001), other arrhythmia (OR 2.33; 95% CI 1.25-4.34, p=0.0081), PAC/PVC (OR 3.68; 95% CI 2.18-6.19, p<0.0001), TCA (OR 4.37; 95% CI 1.57-12.12, p=0.0047), smoking (OR 1.78; 95% CI 1.10-2.90, p=0.0198), and male (OR 0.40; 95% CI 0.24-0.68, p=0.0006).

Conclusion: This study suggests that NAFLD is an important independent risk factor for QT prolongation. We recommend a prospective randomized trial to identify the causation and mechanism of QT prolongation in NAFLD. Physicians should be cautious prescribing medications that are known to prolong QT interval in patients with NAFLD.

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