Prevalence and Risk Factors of Non-alcoholic Fatty Liver Disease in Type 2 Diabetes Mellitus Patients with Normal Serum Aminotransferase Levels

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Background: Non-alcoholic fatty liver disease (NAFLD) is more common and more severe in patients with diabetes mellitus type 2 (T2DM). Serum aminotransferase (ALT) levels may not necessarily correlate with the degree of inflammation and fibrosis in patients with NAFLD. Whilst, a proportion of those patients with normal ALT levels can have significant steatosis, inflammation and/or fibrosis. In addition, the prevalence and severity of NAFLD in T2DM patients with normal serum aminotransferase (ALT) is unclear.

Objectives: To evaluate the prevalence and risk factors of NAFLD and liver fibrosis in T2DM patients with normal ALT.

Materials and Methods: T2DM patients with persistently normal ALT (≤40 IU/L for ≥2 occasions during ≥ 6 months) were evaluated by controlled attenuation parameter and transient elastography (CAP-TE) at Rajavithi Hospital, Bangkok during January-September 2017. Exclusion criteria were T1DM, significant alcohol drinking, chronic viral hepatitis, and use of medications that may affect NAFLD. The cut-offs for steatosis included CAP 215 dB/m (S1) and CAP 252 dB/m (S2). Whereas, fibrosis were TE 7.0 kPa for significant fibrosis and TE 10.0 kPa for advanced fibrosis (NAFLD ≥ S1).

Results: There were 180 patients in the study. Of these, 65.6% were female with median age of 59.5 (27-80) years. Median body mass index (BMI) was 26.15 (16.8-42.22) kg/m² and 55.6% were obese (BMI ≥25). The median duration of T2DM was 8 (0.25-40) years and 37.8% had microvascular complications. Prevalence of NAFLD was 82.8% (64.4% ≥ S2). Prevalence of NAFLD with significant fibrosis and advanced fibrosis were 24.4% and 11.1%, respectively. Four non-invasive scoring systems for predicting liver fibrosis, including NAFLD fibrosis score, BARD score, FIB-4 score, and AST/ALT ratio, were evaluated and showed no correlation with TE findings. By multivariate analysis, significant predictors for steatosis were female, obesity (BMI ≥25), and triglyceride level. Meanwhile, significant predictor for significant and advanced fibrosis was obesity.

Conclusions: NAFLD and fibrosis are relatively common among T2DM patients with normal ALT. Obesity appears to be a good predictor for steatosis and fibrosis in this population.

Keywords: Non-alcoholic Fatty Liver Disease, Transient Elastography, Diabetes Mellitus