Clinical And Diagnostic Characteristics of Non-Alcoholic Fatty Liver Disease Among Egyptian Children and Adolescents with Type1 Diabetes

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Abstract:

Background:

Type 1 diabetes mellitus (T1DM) patients are at an increased risk for non-alcoholic fatty liver disease (NAFLD). This study aimed to evaluate the clinical criteria associated with the diagnosis of Non-Alcoholic Fatty Liver Disease (NAFLD) among T1DM Egyptian children and adolescents. Methods 74 T1DM patients aged 8–18 year were enrolled in this cross-sectional study.

Assessments of Clinical status, anthropometric measures, lipid profile, glycated hemoglobin (HbA1c) and liver enzymes were done.

Abdominal Ultrasound evaluation of hepatic steatosis was done. Accordingly, patients were divided into two groups (NAFLD and normal liver group) and compared together. Assessment of liver fibrosis using acoustic radiation force impulse elastography (ARFI) was done.

Statistical analysis included; independent t-test, Chi square and Fisher's Exact, Pearson and Spearman tests and Logistic regression models for factors associated with fatty liver were used when appropriate.

Results:

In this study; 74 patients were enrolled; 37 males (50%) and 37 females with mean age 14.3 +- 3.0 year. The mean insulin dose was 1.1 +-0.4 U/kg and mean disease duration was 6.3 +- 3.0 year. NAFLD was detected in 46 cases while 28 cases had normal liver as diagnosed by abdominal ultrasound. Cases with NAFLD had statistically significant higher BMI-Z scores, waist/hip, waist/height and sum of skin fold thicknesses compared to those with normal liver($P < 0.05$). The mean value of HbA1c % was significantly higher in NAFLD group ($P = 0.003$). Total cholesterol, triglycerides and LDL serum levels were significantly elevated ($p < 0.05$), while the HDL level was significantly lower in NAFLD cases ($p = 0.001$). Although, serum levels of liver enzymes; ALT and AST were significantly higher among cases with NAFLD than in normal liver group ($p < 0.05$), their means were within normal.
Using the ARFI elastography; NAFLD cases exhibited significant fibrosis (F2, 3 and 4). BMI, patient age and female gender were among risk factors for NAFLD.

Conclusions:

NAFLD represents a serious consequence in type 1 diabetic children and adolescents that deserves attention especially with poor glycemic control. NAFLD has the potential to evolve to fibrosis. This study demonstrated a very high prevalence of NAFLD in T1D children and adolescents using US which was (62.2%).