PAEDIATRIC

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Presence of Metabolic Syndrome Predicts Advanced Liver Disease among Paediatric Patients with Non-Alcoholic Fatty Liver Disease

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INTRODUCTION
Non-alcoholic fatty liver disease (NAFLD) among paediatric population is increasing globally along with the growing obesity epidemic. Fibrosis is an important predictor of advanced liver disease, cardiovascular events and malignancy in adults. This study aims to investigate the relationship between hepatic steatosis, alanine aminotransferase (ALT) and components of the metabolic syndrome with NAFLD among children with obesity and diabetes.

METHODOLOGY
Children from paediatric diabetes and obesity clinic in University Malaya Medical Centre were invited to participate in the study between 2016 and 2019. All had transient elastography (Fibroscan, Echosens, Paris). NAFLD was assessed by liver stiffness measurement (LSM) and controlled attenuation parameter (CAP). We categorized LSM as 7.0 kPa for fibrosis stage F≥2, 8.7 kPa for F≥3 and 10.3 kPa for F4 (cirrhosis). Mild, moderate and severe steatosis (CAP=1, 2 and 3, respectively) were defined as >248 dB/m,>268 dB/m and>280 dB/m respectively. Data on basic demographics, anthropometric measurements and clinical components of metabolic syndrome were collected.

RESULTS
A total of 56 children (60.7% male) with ages between 6 to 18 years old (median 13 years) were recruited. There were 64.3% Malays, 19.6% Indians, 12.5% Chinese and 3.6% other ethnicities. ALT levels are positively correlated with LSM values and CAP score ($p<0.05$). A total of 20 (35.7%) had fibrosis, among which 10 (17.9%) had significant fibrosis (F2), 5 (8.9%) had advanced fibrosis (F3) and another 5 (8.9%) had cirrhosis (F4). Among 76.8% (n=43) of patients with steatosis, 2 (3.6%) had mild steatosis, 2 (3.6%) had moderate steatosis and 39 (69.6%) had severe steatosis. There were 18 (32.2%) who had diabetes mellitus, 5 (8.9%) had hypertension, and 23 (41%) fulfilled the criteria for metabolic syndrome. Fibrosis is significantly associated with presence of metabolic syndrome (OR=3.409, 95% CI: 1.089-10.676, p=0.032).

CONCLUSION
Obese children with metabolic syndrome are more likely to have advanced liver disease compared to those without metabolic syndrome.