214
ANTHROPOMETRIC MEASUREMENTS DURING CHILDHOOD PREDICT NONALCOHOLIC FATTY LIVER DISEASE IN ADOLESCENTS

Oyekoya T. Ayonrinde[1,2], John K. Olynyk[2,3], Lawrie J. Beilin[1,4], Trevor A. Mori[1], Wendy H. Oddy[5], Leon Adams[1,6]; [1]School of Medicine and Pharmacology, The University of Western Australia, Perth, WA, Australia; [2]Gastroenterology and Hepatology, Fremantle Hospital, Fremantle, WA, Australia; [3]Western Australian Institute of Medical Research, Nedlands, WA, Australia; [4]Royal Perth Hospital, Perth, WA, Australia; [5]Population Health, Telethon Institute for Child Health Research, Nedlands, WA, Australia; [6]Liver Transplantation Unit, Sir Charles Gairdner Hospital, Nedlands, WA, Australia

Nonalcoholic fatty liver disease (NAFLD) and metabolic risk factors for NAFLD are predominantly diagnosed in adults and are frequently not suspected nor diagnosed during childhood and adolescence despite an association with prevalent or future risk for the metabolic syndrome, nonalcoholic steatohepatitis (NASH), cirrhosis, type 2 diabetes and atherosclerotic cardiovascular disease. Identification of children at increased risk of future NAFLD, may guide interventions to prevent adolescent and adult NAFLD and associated metabolic disorders. Objectives and Methods: We sought a relationship between childhood anthropometry (including weight, body mass index (BMI), skinfold thickness (SFT), head circumference (HC), chest circumference (CC) and arm circumference (AC)) and adolescent NAFLD in 1170 serially well characterized 17-year-old adolescents participating in the Western Australian Pregnancy Cohort (Raine Cohort) Study. Case-control analysis was performed using anthropometric measurements serially recorded from birth. NAFLD was diagnosed using liver ultrasound at age 17 years. Results: 150/1170 adolescents (12.8%) were diagnosed with NAFLD. Neither birth weight nor percentage of expected birth weight was associated with NAFLD. There were significant differences in anthropometry acquired during childhood between participants subsequently diagnosed with NAFLD and those without NAFLD. There was a significant mean (sd) body weight difference of 2.7% at age 3 years (15.3 (1.7) kg vs. 14.9 (1.8) kg), progressing to a difference of 24.7% (81.4 (20.5) kg vs. 65.3 (11.5) kg at age 17 years between those with NAFLD and those without NAFLD ($p<0.05$ at all ages). HC was smaller from age 1 year to 5 years while SFT was greater from age 2 years, BMI and AC from age 3 years and CC from age 5 years onwards ($p<0.05$ for all). Boys diagnosed with NAFLD at age 17 years had higher systolic blood pressure than boys without NAFLD from age 10 years ($p<0.05$). Apart from HC, all of these differences persisted and increased through age 17 years. Using multiple logistic regression analysis adjusted for body weight, BMI, AC and CC up to age 5 years, greater suprailiac SFT at age 3 years (OR 1.18, 95% CI 1.05-1.33, $p=0.006$), CC at age 5 years (OR 1.15, 95% CI 1.08-1.24, $p<0.001$) and smaller HC at age 1 year (OR 0.65, 95% CI 0.53-0.80, $p<0.001$) were independent predictors of adolescent NAFLD. Conclusions: Changes in growth and adiposity from as early as one year of age are associated with the future development of NAFLD in 17 year olds. Anthropometric measurements during early childhood may identify individuals predestined to develop NAFLD and allow early targeted intervention.

Disclosures:

John K. Olynyk - Grant/Research Support: Roche, Bayer, Pfizer

The following people have nothing to disclose: Oyekoya T. Ayonrinde, Lawrie J. Beilin, Trevor A. Mori, Wendy H. Oddy, Leon Adams