ABSTRACT

Non-alcoholic Fatty Liver Disease among Adult Survivors of Severe Acute Malnutrition

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Early life exposure to undernutrition has been associated with cardiovascular risk factors. This cross-sectional study investigated non-alcoholic fatty liver disease (NAFLD) in adult survivors of childhood severe acute malnutrition (SAM). Data regarding birth weight, infant growth, adult anthropometry, body composition, fasting blood glucose, insulin, lipids, alanine aminotransferase, adiponectin, liver fat and whole-body fat oxidation were collected.

This thesis is presented in 5 manuscripts. The first describes the use of CT scan to estimate liver fat. An unexposed control group was then used to describe the characteristics of fatty liver disease. The thesis then compared liver fat in adult SAM survivors and matched controls and also between adult marasmus (Ms) and kwashiorkor (Ks) survivors. The relationships between liver fat and catch-up weight and height gain were then investigated. Finally, the thesis investigated relationships between birth weight, whole-body fat oxidation and liver fat.

Fatty liver disease displayed atypical characteristics in our Afro-Caribbean participants; viz. liver fat was not related to serum lipids or liver enzymes and had an inverse association with insulin resistance. Malnutrition survivors had less liver fat than controls; and Ms had more liver fat than Ks after adjusting for age, sex, BMI and birth weight. Faster catch-up weight and post-discharge height gain were both associated with more liver fat in adult survivors. Finally, whole-body fat oxidation was not associated with liver fat or birth weight.

As the prevalence of SAM increases, it is imperative that its long-term consequences be fully elucidated. This thesis recommends further studies that might identify metabolic intermediaries and establish pathways that could explain the associations that were demonstrated.

Keywords: Debbie Suzanne Thompson; severe acute malnutrition; non-alcoholic fatty liver disease; marasmus; kwashiorkor; catch-up growth; whole-body fat oxidation.