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The metabolically unhealthy obese phenotype is associated with inefficient exogenous lipid metabolism compared to BMI- and age- matched healthy controls: A pilot study

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Background: Alterations in postprandial lipid handling and metabolism, including raised plasma triacylglycerol (TAG) and non-esterified fatty acids (NEFAs) have been implicated in the pathophysiology of type 2 diabetes and cardiovascular disease. Less is known about their role in metabolically unhealthy obesity. The increase in postprandial TAG and NEFA may contribute to the deposition of lipids in ectopic sites, as described by the adipose tissue expandability hypothesis.

Objectives: We aimed to investigate the handling of exogenous lipids following a test meal, alongside an array of physical, dietary and biochemical measurements, including insulin resistance. We hypothesised that metabolically unhealthy subjects would exhibit increased postprandial lipaemia, and increased chylomicron-TAG, compared with age- and BMI-matched healthy controls.

Methods: Participants were grouped according to the presence or absence of the metabolic syndrome (i.e. metabolically unhealthy). Eight subjects underwent measures of i) insulin resistance ii) physical activity and fitness iii) exogenous lipid handling using a labelled fatty acid.

Results: Metabolically unhealthy obesity was associated with poorer buffering of postprandial exogenous lipid flux. The tracer concentration area under the curve was significantly higher in the metabolically unhealthy cohort when adjusted for basal metabolic rate [632 (95% Confidence interval: 356, 910)] versus [177 (95% CI: 98, 257) P=0.021].

Conclusions: The metabolically unhealthy obese phenotype is associated with inefficient postprandial lipid metabolism. Further studies are needed to confirm these findings and elucidate whether inefficient lipid handling results in ectopic fat deposition.

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