White Adipose Tissue-apoCI Accretion; Relation to Delayed Plasma Clearance of Dietary Fat in Humans

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Objective: Dysfunctional white adipose tissue (WAT) is believed to promote delayed plasma clearance of dietary fat, but the underlying mechanisms for dysfunctional WAT are not very clear. ApoCI is a transferable apolipoprotein between HDL and triglyceride rich lipoproteins that inhibits lipoprotein lipase activity. We recently reported the secretion of apoCI from a human adipocyte model. Our aim was to define whether increased apoCI secretion from WAT contributes to delayed dietary fat clearance in humans.

Methods/Results: Following the ingestion of a $^{13}$C-triolein labelled high-fat meal, post-menopausal obese women with high WAT-apoCI secretion (> median 0.81 µM/g, N=9) had delayed plasma clearance of postprandial $^{13}$C-triglyceride and $^{13}$C-non-esterified fatty acids (NEFA) compared to women below the median. Women with high WAT-apoCI secretion had higher enrichment of apoB-lipoproteins with apoCI (6.8 ± 0.8 vs 3.8 ± 0.7 µM apoCI/µM apoB, p=0.009). WAT-apoCI secretion was the primary predictor of the enrichment of postprandial apoB-lipoproteins with apoCI ($R^2=0.50$, p=0.001) but did not correlate with HDL-associated apoCI. Correcting for the enrichment of apoB-lipoproteins with apoCI eliminated the association of WAT-apoCI secretion with the AUC of plasma $^{13}$C-triglyceride.

Conclusion: Higher WAT-apoCI secretion may promote delayed plasma clearance of dietary fat through the enrichment of apoB-lipoproteins with apoCI.

Funding: Canadian Institutes of Health Research (CIHR), Canadian Foundation for Innovation (CFI), Heart and Stroke Foundation of Canada, Astra Zeneca