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Exogenous postprandial triglyceride metabolism in black African/Caribbean versus white European men

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Black African/Caribbean (BAC) populations experience greater type 2 diabetes (T2D) risk compared to white Europeans (WE)[(1)], despite a more desirable body composition profile and lower fasting triglyceride (TAG)[(2)]. Postprandial lipaemia may account for residual risk[(3)]. This interim analysis compares postprandial TAG metabolism between WE and BAC men, using stable isotope techniques. Nine WE and five BAC men, without T2D, between 25 and 40 years old, and body mass index (BMI) 25–40 kg/m^2, were recruited. Participants were fed two consecutive high-fat meals (containing 50 g at time 0 and 30 g fat at 300-minutes), with blood sampling over 480-minutes. The first meal contained 0.2 g U-^{13}C palmitate to evaluate exogenous TAG metabolism (AUC$^{0–300}$). The second meal allows for evaluation of delayed intestinal release of earlier meal (area under curve; AUC$^{300–480}$). Plasma lipoprotein TAG were separated by density gradient ultracentrifugation, obtaining Svedberg flotation rate (Sf) > 400 (approximates chylomicrons) and Sf 20–400 TAG (approximates Very Low-Density Lipoprotein). Plasma, Sf > 400 and Sf 20–400 TAG were prepared as fatty acid methyl esters. Isotope enrichment was measured by gas chromatography-mass spectrometry and presented as tracer:tracee ratio (TTR)-AUC, calculated using the trapezoidal rule. Body fat (BF)% was measured by BodPod. Normally distributed data were analysed using independent samples T-test (means ± SD). Skewed data were analysed with Mann-Whitney U (median (IQR)). Groups were matched for age (BAC: 31 ± 4; WE: 34 ± 5 years, $p = 0.20$), BMI (BAC: 27.6 (3.8); WE: 26.9 (5.7) kg/m^2, $p = 0.70$) and BF% (BAC: 20.2 ± 7.2; WE: 22.2 ± 9.0 %, $p = 0.68$).

There was a trend towards greater plasma TTR-AUC$^{0–480}$ in BAC compared to WE (4.98 ± 1.65 *vs.* 3.61 ± 1.00, $p = 0.09$) and plasma TTR-AUC$^{0–300}$ (2.80 ± 1.04 *vs.* 1.80 ± 0.97, $p = 0.10$). There was no ethnic difference in plasma TTR-AUC$^{300–480}$ (2.18 ± 0.75 *vs.* 1.82 ± 0.37, $p = 0.267$).For Sf >400, the TTR-AUC$^{0–480}$ was 15.78 ± 2.36 *vs.* 14.66 ± 2.18 in BAC and WE, ($p = 0.39$); Sf >400 TTR-AUC$^{0–300}$ (10.48 ± 1.70 *vs.* 8.73 ± 2.39, $p = 0.17$); Sf >400 TTR-AUC$^{300–480}$ (5.29 ± 1.67 *vs.* 5.94 ± 2.03, $p = 0.56$).For Sf 20–400, the TTR-AUC$^{0–480}$ was 2.68 ± 1.24 *vs.* 2.22 ± 0.95 in BAC and WE ($p = 0.45$); Sf 20–400 TTR-AUC$^{0–300}$ (1.18 ± 0.68 *vs.* 0.88 ± 0.41, $p = 0.31$); Sf 20–400 TTR-AUC$^{300–480}$ (1.50 ± 0.61 *vs.* 1.34 ± 0.59, $p = 0.65$).

A greater ratio of tracer in postprandial TAG indicates a greater contribution of meal-derived TAG (in chylomicrons) to total plasma TAG in BAC. Although participant numbers are small, this interim analysis indicates that differences between ethnicities in postprandial TAG concentration relates to intestinal handling, rather than the liver.

References

1. Tillin T, Hughes A, Godsland I *et al.* (2013) *Diabetes Care* **36**, 383–939.
2. Hakim O, Bello O, Ladwa M, *et al.* (2019) *Diabetes Res Clin Pract* **156**, 107866.
3. Goff L, Whyte M, Samuel M *et al.* (2016) *Lipids Health Dis* **15**, 1–9.

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