South Africa - Fatty acid metabolism and associations with insulin sensitivity differs between black and white South African women

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Overview

Identification

ID NUMBER
Fattyacidmetabolismandassociationswithinsulinsensitivity

Overview

ABSTRACT
Purpose: Genetic differences in desaturase genes and consequently fatty acid metabolism have been reported. The aims were to examine ethnic differences in serum fatty acid composition and desaturase indices, and assess the ethnic-specific associations with insulin sensitivity (IS) and liver fat in black and white South African (SA) women.

Methods: In this cross-sectional study including 92 premenopausal black (n=46) and white (n=46) SA women, serum fatty acid composition was measured in cholesteryl ester (CE) and non-esterified fatty acid (NEFA) fractions. Desaturase activities were estimated as product-to-precursor ratios: stearoyl-CoA desaturase-1 (SCD1-16, 16:1n-7/16:0); d-5 desaturase (D5D, 20:4n-6/20:3n-6) and d-6 desaturase (D6D, 18:3n-6/18:2n-6). Whole-body IS was estimated from an oral glucose tolerance test using Matsuda index. In a sub-sample (n=30), liver fat and hepatic IS were measured by 1H-magnetic resonance spectroscopy and hyperinsulinemic euglycaemic clamp, respectively.

Results: Despite lower whole-body IS (P=0.006), black women had higher CE D5D and lower D6D and SCD1-16 indices than white women (P<0.01). CE D6D index was associated with lower IS in white women only (r=-0.31, P=0.045), whereas D5D index was associated with higher IS in black women only (r=0.31, P=0.041). In the sub-sample, D6D and SCD1-16 indices were positively and D5D was negatively associated with liver fat (P<0.05). Conversely, CE SCD1-16 was negatively associated with hepatic IS (P<0.05), but not independently of liver fat.

Conclusions: Ethnic differences in fatty acid-derived desaturation indices were observed, with insulin resistant black SA women paradoxically showing a fatty acid pattern typical for higher insulin sensitivity in European populations.

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

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Sampling

No content available

Questionnaires

No content available

Data Collection

Data Collection Dates

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2020-01-01	2020-08-31	N/A

Data Processing

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Variable List

Documentation

Other materials

Table 1

Title	Table 1
Author(s)	Goedecke
Date	2020
Country	South Africa
Language	English
Filename	http://medat.samrc.ac.za/data/fatty_acid_metabolism/JCEM_Supplementary_Table1.pdf

Table 2

Title	Table 2
Author(s)	Goedecke
Date	2020
Country	South Africa
Language	English
Filename	http://medat.samrc.ac.za/data/fatty_acid_metabolism/JCEM_Supplementary_Table2.pdf