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The impact of ethnicity on fat deposition in male subjects

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Introduction: Excess ectopic lipid in the liver (intrahepatocellular lipid (IHCL)) is strongly associated with insulin resistance (IR) and the development of type 2 diabetes (1) South Asian (SA) populations have a higher prevalence of type-2 diabetes (2), IR (3,4) and central obesity (5) compared with Caucasian (Cau) subjects. However, there is a paucity of data regarding the effect(s) of ethnicity on content and distribution of adipose tissue and ectopic fat.

Aim: To quantify and determine the impact of ethnic differences on body composition and IHCL in a matched cohort of Caucasian and SA men.

Method: Total (TAT) and regional adipose tissue content were assessed by magnetic resonance imaging (MRI), with IHCL measured using magnetic resonance spectroscopy (MRS) in a cohort of healthy SA and Caucasian males. SA were matched for age (± 2 year) and BMI (± 2 kg/m²) with Caucasian counterparts.

Results: 408 male volunteers took part in the study, 345 Caucasians and 63 SA. From these individuals, 54 SA were matched with Caucasians for age (Range 19-72 yrs) and BMI (Range 20.2-40.4 kg/m²). SA subjects had significantly elevated IHCL (SA: 0.58 ± 0.43 vs. Cau: 0.42 ± 0.45 ; $p=0.03$, Figure 1A) and TAT (SA: 26.19 ± 9.18 liters vs. Cau: 23.96 ± 8.58 liters; $p=0.01$, Figure 1B) compared with their Caucasian counterparts. There was a non-significant trend towards increased visceral adipose tissue (VAT) in SA, Figure 1C. (SA: 3.41 ± 1.98 liters vs. Cau: 3.04 ± 1.69 liters; $p=0.07$).

Conclusion: Our results indicate that SA have proportionally higher levels of TAT and IHCL compared to their Caucasian counterparts when matched for gender, age and BMI. Increased IHCL is strongly associated with insulin resistance and type 2 diabetes. The ethnic differences in body composition and ectopic fat may contribute to the increased susceptibility of SA to insulin resistance and type 2 diabetes. Future studies with larger matched cohorts are needed to confirm these findings and determine if the trend towards increased VAT in SA is a genuine effect.

Biography

Wareed Alenaini completed her MSc degree at Imperial College London in Molecular Imaging in 2014. Currently, she is undertaking a PhD investigating the impact of ethnicity on body composition and health at the University of Westminster. By providing new mechanistic understanding of obesity-related conditions, the long term goal aims to define the parameters of optimal health for individuals as well as developing new strategic method for fighting obesity. Wareed contributed to Arabic TV programs discussing her work and its implications in Saudi Arabia, her country of origin. She has also published articles in well-known Arabic newspaper AlArabyia and Alwatan.

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