

Weight gain appears to have greater metabolic consequences in South Asian men

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Credit: Nataliya Vaitkevich from Pexels

Gaining even a small amount of weight may lead to adverse metabolic responses in young South Asian men according to new research.

The study—led by the University of Glasgow and [published](#) in *Nature Metabolism*—may shed light on why South Asians are at greater risk of developing type 2 [diabetes](#) compared with other [ethnic groups](#), and why their risk of diabetes increases more steeply with increasing BMI.

The research—which is part of the GlasVegas (Glasgow visceral and ectopic fat with weight gain in South Asians) study—investigated 14 young normal weight men of South Asian ethnic origin and 21 men of white European ethnicity before and after an overfeeding protocol to gain approximately 5 kg in weight.

The main finding was that this modest weight gain resulted in substantial adverse metabolic responses in the South Asian men. In contrast, the white European men appeared to exhibit a degree of "metabolic buffering capacity," such that the same weight gain led to much smaller metabolic changes. Insulin sensitivity—or how well [body tissues](#) respond to insulin—decreased by 38% in the South Asian men, but only by 7% in the white Europeans.

South Asians comprise about a quarter of the world's population and have 3–5 times the prevalence of type 2 diabetes compared to white Europeans. South Asians also develop type 2 diabetes at much lower BMIs (Body Mass Indexes) than white Europeans.

A South Asian person with a BMI of around 22 kg/m²—well within the "normal" weight range—has an equivalent risk of type 2 diabetes as a white European person with a BMI of 30 kg/m² (the conventional threshold for obesity).

The adverse metabolic consequences of weight gain in the South Asian men appeared to be related to the size of fat cells at baseline, and the change in the amount of fat in small fat cells.

The South Asians had larger fat cells before weight gain and appeared to be unable to recruit small fat cells to grow into larger fat cells with weight gain. This suggests that, unlike white Europeans, the fat was more likely to go into other areas such as the liver, which can have adverse metabolic consequences.

Professor Jason Gill, Professor of Cardiometabolic Health at the University of Glasgow, said, "We were keen to try and better understand why South Asian people are at a higher risk of type 2 diabetes, even with lower BMIs, than their white European counterparts.

"We found that when young, lean white European men gained a little weight—about 5 kg—they did not experience any substantial adverse metabolic consequences; but when young, lean South Asian men gained the same amount of weight, they started to exhibit metabolic dysfunction.

"Insulin sensitivity decreased by 38% in South Asians, but only by 7% in white Europeans, indicating that South Asians were not able to buffer against the adverse effects of weight gain in the way that their white European counterparts were able to.

"This appears to be related, at least in part, to differences in the size of fat cells between South Asian and white European men, and how they respond to the effects of weight gain.

"The South Asian men had more large fat cells, and the very small fat [cells](#) that they had were less able to grow in size as they put on weight. Both these factors were related to the adverse metabolic changes with weight gain."

Dr. James McLaren, Honorary Clinical Senior Lecturer at the University of Glasgow's Undergraduate Medical School, added, "Another

interesting observation was that when the European men put on weight, they put on some lean tissue as well as fat tissue, but the South Asian men essentially just put on fat tissue.

"This may be important, as increasing lean tissue may help protect against some of the adverse effects of weight gain, as sugar is cleared from the blood in lean tissue, or muscle.

"Our study's findings reinforce the need for the prevention of [weight gain](#) in South Asian men, in order to prevent further risk of type 2 diabetes."

More information: James McLaren et al, Weight gain leads to greater adverse metabolic responses in South Asian compared with white European men: the GlasVEGAS study, *Nature Metabolism* (2024). [DOI: 10.1038/s42255-024-01101-z](#)

Provided by University of Glasgow

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