

OBESITY

Variations in adipose tissue fibrosis

The adipose tissue of patients with obesity and type 2 diabetes mellitus (T2DM) is characterized by reduced fibrosis and increased hypertrophy, according to new findings.

The role of adipose tissue fibrosis in the development of metabolic disease is not clear, but the effect seems to be dependent on BMI. Lean people with a high level of adipose tissue fibrosis have an increased risk of T2DM, whereas similar levels of fibrosis seem to be protective in patients with obesity. A new study, led by Robert O'Rourke, set out to clarify the role of adipose tissue fibrosis in patients with obesity.

The researchers enrolled 82 patients who were undergoing bariatric surgery: 34 had T2DM and 48 did not have T2DM. Samples of visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT)

were collected during the surgery. Analysis of the samples demonstrated that adipocyte hypertrophy in SAT and VAT was increased in the patients who had T2DM, compared with those who did not have T2DM. Furthermore, fibrosis in VAT and SAT was higher in the samples from patients with T2DM than in samples from patients without T2DM. Patients with T2DM also had a reduced number of preadipocytes in VAT (but not SAT) compared with patients who did not have T2DM.

"These observations led us to propose a model in which fibrosis acts as an adaptive response in obese adipose tissue, limiting adipocyte hypertrophy and resultant cellular metabolic dysfunction and thus attenuating systemic metabolic disease," explains O'Rourke. The researchers note that some of their findings are controversial, and

conflict with previously published work from other groups. O'Rourke suggests that further research is needed. "Perhaps most importantly, current methods to assess fibrosis primarily study static features in fixed tissues. A key next step will be to define dynamic mechanisms of regulation of adipose tissue metabolism mediated by the extracellular matrix (ECM)," says O'Rourke. "We are developing methods to isolate and culture adipose tissue ECM to permit study of the specific roles of the matrix and adipocytes in regulating the ultimate adipose tissue metabolic phenotype."

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