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Commentary

The role of adipose tissue in health and diet

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DESCRIPTION

A loose connective tissue made primarily of adipocytes is known as adipose tissue, body fat, or simply fat. In addition to adipocytes, adipose tissue also contains the stromal vascular fraction (SVF), which is made up of a range of immune cells like adipose tissue macrophages, preadipocytes, fibroblasts, and vascular endothelial cells. Preadipocytes are the source of adipose tissue. Although it also protects and insulates the body, its primary function is to store energy in the form of lipids. Adipose tissue is far from being hormonally inert; in fact, it has recently come to be recognised as a key endocrine organ due to its production of hormones such as leptin, oestrogen, resistin, and cytokines, particularly TNF. Adipokines, which are pro-inflammatory signals released chronically by adipose tissue in obesity, are what cause metabolic syndrome, a cluster of illnesses that includes but is not limited to type 2 diabetes, cardiovascular disease, and atherosclerosis. Obesity is a complex disorder that has a variety of various effects on a patient's life and health. Nevertheless, the majority of obesity treatment strategies are not currently given, at least not in a systematic way, based on unique obesity sub-phenotypes or particularly anticipated health hazards. One of the tissues most obviously impacted by obesity is adipose tissue. Aging causes considerable alterations to adipose tissue, the vital energy source and endocrine organ for the maintenance of systemic glucose, lipid, and energy homeostasis. In the elderly population, these changes lead to physiological deterioration and age-related diseases. Adipose tissue ageing also affects other organs that are lipid-infiltrated, which causes systemic inflammation, metabolic system disturbance, and acceleration of the ageing process. Additionally, research has shown that adipose ageing is an early-onset ageing event and a possible target for lifetime extension. Together, we argue that adipose tissue represents a therapeutic target for the treatment of age-related diseases and plays a significant role in the ageing process. The body's essential hormones and overall energy homeostasis are regulated by adipose tissue, which is thought of as a metabolic organ. Lipid accumulation and persistent extracellular matrix deposition occur when caloric intake exceeds energy expenditure. In addition to hypoxia and inflammation, extracellular matrix flexibility may be decreased by excess lipids and adipocyte hypertrophy. Adipose tissue fibrosis and associated metabolic dysfunctions, like insulin resistance, are brought on by these mechanisms. Adipose tissue is an immunologically active organ that has a variety of effects on how the body's overall energy metabolism is regulated. The interactions between adipocytes and different immune cells control adipose tissue immunity. However, the fundamental processes governing the interactions between immune cells and adipocytes in adipose tissue remain poorly understood. Adipocytes have been shown to use lipid metabolites as a major mediator to start and control a variety of adipose tissue immune responses. To ascertain adipose immune tones, adipocytes release lipid metabolites and provide lipid antigens. Adipocyte fate and function in response to metabolic stimuli are also controlled by interactions between adipocytes and adipose immune cells. The control of body fat distribution in humans is mediated by the gonadal steroids, including androgens, estrogens, and progestogens. However, sex steroids have a significant impact on adipose tissue function in addition to affecting the size and location of fat depots.

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