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Letter to Editor Open Access

Excessive Adiposity an Established Risk Factor for Metabolic Diseases

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Letter to Editor

Excess adiposity is an established risk factor for metabolic disease and visceral adipose tissue plays a major role in the low-grade inflammatory state associated with obesity. Chemokines play an important role in leukocyte trafficking and circulating chemokine levels are increased by inflammatory processes, including obesity-related diseases. Chemokines are key factors in innate and adaptive immunity. Human adipocytes were derived from cryopreserved omental preadipocytes of subjects with a body mass index (BMI) <30 kg/m^2 or >30 kg/m^2. Visceral adipocytes from subjects with a BMI >30 kg/m^2 expressed mRNA for monocyte chemoattractant protein-1 (MCP-1/CCL2), regulated on activation, normal T cell expressed and secreted (RANTES/CCL5), epithelial cell-derived neutrophil-activating peptide-78 (ENA-78/CXCL5), interleukin-8 (IL-8 /CXCL8), lymphotactin-β (XCL2), and fractalkine (CX3CL1). Although visceral adipocytes from subjects with a BMI <30 kg/m^2 also showed expression of MCP-1, RANTES, ENA-78, and IL-8 mRNA, neither lymphotactin-beta nor fraktalkine mRNA was detected. Lymphotactin-beta/XCL2 is the defining member of the C class chemokines and it has chemotactic activity for lymphocytes, but not monocytes or neutrophils. Fractalkine is chemokine that attracts T cells. Thus, obesity may be associated with up-regulation of lymphotactin-beta/XCL2 and CX3CL1/ fractalkine mRNA expression by adipocytes compared with adipocytes from non-obese subjects.

Most studies of adipocytes have employed 3T3-L1, which is a murine preadipocyte cell line. Gene profiling using biopsy specimens of human subcutaneous adipose tissue has demonstrated an inflammatory response evoked by lipopolysaccharide. To investigate visceral adipocytes, it is necessary to obtain adipose tissue samples during intra-abdominal (laparoscopic) surgery. Advanced techniques for the cryopreservation of human visceral preadipocytes could increase the usefulness of these cells for studies of obesity. The chemokine responses associated with obesity-related inflammation were well preserved in cultured human adipocytes derived from cryopreserved preadipocytes.