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Effects of obesity on the immune system

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Abstract:

Introduction: The incidence of obesity is rising fast all over the world increasing the obesity-related diseases such as diabetes, atherosclerosis, osteoarthritis and some cancers. Well understanding the pathology of obesity could be helpful for decreasing the rates of overweight and its associated problems. The role of immune system is to combat microbes or other potentially harmful external substances. Immune- proficiency is related on nutritional states. In this study the effects of obesity on immune system has been evaluated.

Methods: Papers published between the years 1970 and 2015 were searched and studied systematically in Medline. The key words 'immune system and obesity' were used. The related articles were reviewed and summarized.

Results: Studies on overweight humans and animals have shown changed lymphocyte numbers, decreased lymphocytes responses to mitogens, diminished functions of natural killer (NK) cells, macrophages and dendritic cells and irregularity of cytokines secretion. Also the immunomodulatory effects of leptin (produced by adipocytes) on NK cells has been demonstrated. Moreover accumulation of numerous immune cells especially macrophages in adipose tissues due to great food consumption causing chronic inflammation has been reported. Furthermore the number of macrophages in adipose tissue is strongly correlated with bodyweight and whole body fat. In addition decrease of vaccine-induced immunization in obesity has been shown.

Conclusion: Altered immunity in obese state is well recognized in studies involving human and animals. Disturbed immune function in obesity increases the risk of infectious diseases and decreases the immune response to vaccines. Moreover recruitment of immunocompetent cells especially macrophages in adipose tissues leads to chronic inflammation which could have potential implication in development of the inflammatory related disorders. These findings are valuable insights for planning of therapeutic approaches to regulate immune system for managing of related obesity-induced problems.

Keywords:

Obesity, immune system

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