Texas Obesity Research Center

The Impact of Resveratrol on Diet Induced Obesity Changes in Thymic Function

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ABSTRACT

Background: Progenitor cells, produced in the bone marrow, migrate to the thymus where the thymic microenvironment plays a critical role in their differentiation and maturation into T cells. Fat accumulates in the thymus beginning at 1 year of age, causing the thymus to gradually involute as age progresses, thus resulting in a decline in the production of mature T-cells. Obesity augments thymic fat accumulation and hastens the decline in thymic output. Resveratrol, a phytoalexin produced in plants, has also been shown to regulate fat metabolism, in an attempt to reduce hepatic fat accumulation, via 5' adenosine monophosphate-activated protein kinase (AMPK). The effect of AMPK on thymic involution, however, has not yet been determined. **Purpose:** The purpose of this study, therefore, was to study the impact of resveratrol on thymic involution caused by diet-induced obesity. **Method:** C57Bl/6 male mice were fed a normal or high-fat diet in the presence or absence of resveratrol, and comparisons made in thymic fat accumulation and architecture, thymocyte proliferation and apoptosis (analyzed by flow cytometry), and thymic T cell output (measured using the TRECs assay). **Results:** Although negligible change in weight was observed in the low fat groups, the high fat resveratrol fed groups weighed significantly less than the high fat control group. This was also accompanied by a decrease in percent body fat and thymic weight. In addition, changes were also observed in thymocyte proliferation, apoptosis and thymic T cell output. **Conclusions:** The results reported provide a link between changes in lipid metabolism and thymocyte production, and may identify a dietary approach to reduce the deleterious effects of obesity on adaptive immunity.

KEY WORDS: Diet Induced Obesity, Thymus, Resveratrol