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Hormonal and immune changes with age: effect of energy restriction

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The effects of chronic 40% energy-restriction on age-related changes in plasma prolactin, luteinising hormone (LH), testosterone, thyroid-stimulating hormone (TSH) and corticosterone levels as well as the distribution and activity of T and B lymphocytes in the spleen were determined. Male rats (3 months old) were subjected to 40% energy restriction up to the age of 6, 15 and 24 months. Hormones were measured by specific RIA. Lymphocyte subsets were measured by flow cytometry (FASC-Vantage; BD Biosciences, San Jose, CA, USA)[1,2]. Plasma LH and testosterone levels decreased with age, and energy restriction did not change this pattern. However, plasma prolactin and TSH levels, which increased with age in the controls, were significantly decreased in energy-restricted animals. The percentage of CD4+ lymphocytes, which increased with age in the controls, was further increased in energy-restricted rats. Although the percentage of CD8+ lymphocytes decreased with age both in the control and energy-restricted rats, the values were higher in energy-restricted rats at all ages studied. The percentage of T-cells was not affected by age and was increased by energy restriction at all ages studied. B lymphocytes decreased with age and were not modified by energy restriction. The CD4+:CD8+ was greatly increased in the oldest control group, while energy restriction partially decreased this ratio to normal values. These data suggest that energy restriction can prevent some of the deleterious effects that aging induces on the endocrine immune system.

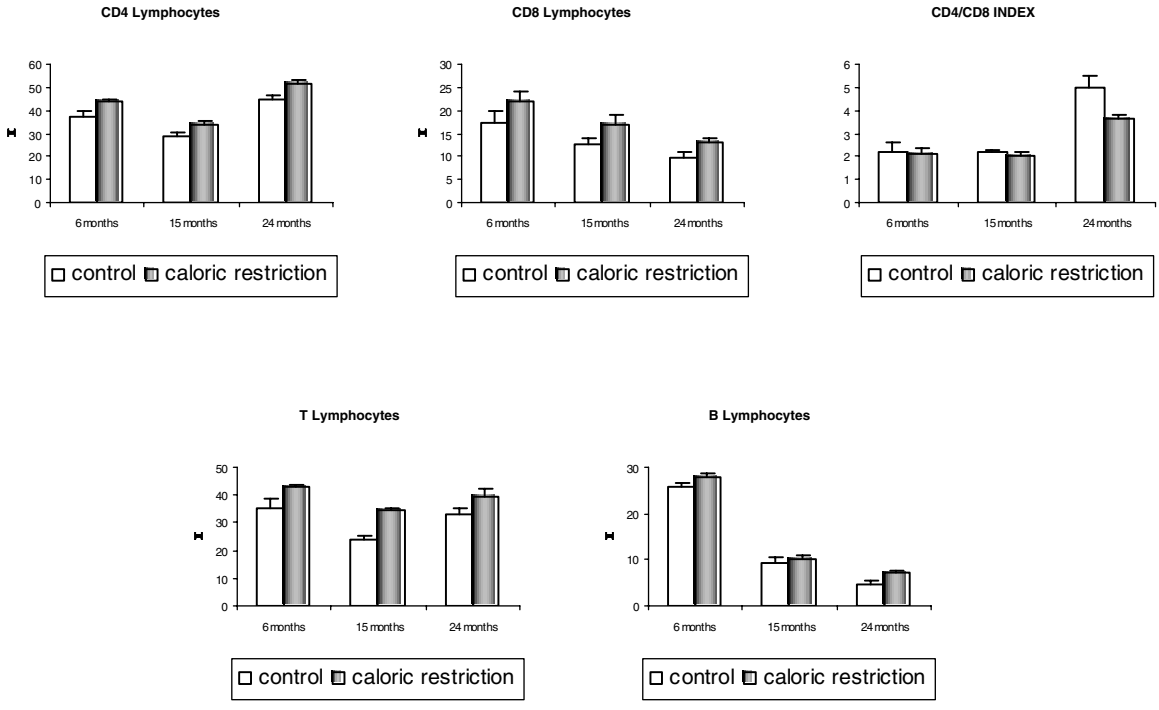

Figure. Values are means with their standard errors represented by vertical bars for six animals per group.

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1. Esquifino AI, Szary A, Brown-Borg HM & Bartke A (1996) *Proc Soc Exp Biol Med* **211**, 87–93.
2. Esquifino AI, Chacon F, Cano P, Marcos A, Cutrera RA & Cardinali DP (2004) *J Neuroimmunol* **156**, 66–73.