Leptin inhibits the reproductive axis in adult male Syrian hamsters exposed to long and short photoperiod

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Abstract

The aim of the study was to investigate the effects of acute leptin treatment of adult Syrian hamsters exposed to a long (LP, eugonadal males) and short photoperiod (SP, hypogonadal males). Animals were exposed to LP (L:D 14:10) or SP (L:D 10:14) for 10 weeks. Afterwards, both LP and SP hamsters were allocated to a control (SP-C, LP-C) or leptin-treated group (SP 3, SP 10, SP 30 or LP3, LP 10, LP 30). One hour before sacrifice, a single dose of leptin (3, 10 or 30 μg/kg) or vehicle was administered (i.p.) to the males. Testis weight, serum and pituitary luteinizing hormone (LH) concentrations, as well as the hypothalamic concentration of gonadotropin-releasing hormone (GnRH) were recorded. Histological analysis of the testis was performed and GnRH concentration in the culture medium of hypothalamic explants was examined. A dramatic regression of testicular weight and histological atrophy of seminiferous tubules, as well as a decrease in serum and pituitary LH concentrations were found in SP males. All doses of leptin significantly reduced serum LH levels and medium GnRH concentrations in both photoperiod groups. Pituitary LH and hypothalamic GnRH concentrations were not affected by leptin. In conclusion, we demonstrated that leptin inhibited the reproductive axis of Syrian male hamsters exposed to LP and SP and fed ad libitum.

Keywords

Leptin; GnRH; LH; Hamster; Photoperiod