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Effects of Experimentally Induced Hyperprolactinemia on the Hypothalamus, Pituitary, and Testes in the Golden Hamster

A. BARTKE¹, R. W. STEGER¹, H. G. KLEMCKE¹, T. M. SILER-KHODR¹, AND B. D. GOLDMAN²

¹ *Department of Obstetrics and Gynecology, The University of Texas Health Science Center at San Antonio, San Antonio, Texas*

² *Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts*

Hyperprolactinemia was induced in adult male golden hamsters by transplantation of four homologous pituitaries under the renal capsules. The resulting elevation of plasma prolactin (PRL) levels was accompanied by a dramatic increase in the concentration of FSH in peripheral plasma. In contrast, plasma LH levels were not affected. The content and concentration of testicular LH receptors, testicular weight, and plasma testosterone levels were significantly greater in hyperprolactinemic hamsters than in the sham-operated control animals. Experimentally induced hyperprolactinemia was associated also with an increase in the hypothalamic content of LHRH and norepinephrine, while the dopamine level in the hypothalamus was not affected. Furthermore, hyperprolactinemia appeared to have increased the release of LH and FSH from the incubated hemipituitaries in the presence and in the absence of LHRH, but only release of LH under basal conditions was significantly affected. The authors conclude from these observations that experimentally induced hyperprolactinemia stimulates testicular function in the golden hamster by increasing the release of endogenous FSH and by increasing the number of LH receptors in the testes. Comparison of these findings with the results of similar experiments in rats and mice suggests that the number of testicular LH receptors can be profoundly influenced by chronic changes in plasma levels of both LH and PRL and that PRL can stimulate LH binding only when LH levels are reduced or unaltered.

Key words: hyperprolactinemia, hypothalamus, pituitary, testis, prolactin, follicle-stimulating hormone, norepinephrine, testosterone, dopamine, luteinizing hormone releasing hormone

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