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Prolactin Stimulation of Testicular Steroid Biosynthesis in the Male Rat

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The effect of prolactin on testicular steroidogenesis was studied in intact adult male rats and in animals treated for 12 days with the LHRH-agonist [D-Ala⁶, des-Gly-NH₂¹⁰]LHRH ethylamide (LHRH-agonist, 1 µg every third day). Testicular LH and prolactin receptors are decreased to 20 and 50% of control, respectively, 26 hours after the last injection of LHRH-agonist. This loss of testicular receptors is accompanied by an increase in the concentration of testicular pregnenolone (500%) and progesterone (700%), whereas 17-OH-progesterone, androstenedione, testosterone, and dihydrotestosterone are decreased to 50, 25, 10, and 60% of control levels, respectively. The injection of 2 mg of ovine prolactin in intact rats 2 hours before sacrifice leads to an increase in testicular 17-OH-progesterone (300%) and androgen (100%) levels. However, in animals treated with the LHRH-agonist, prolactin injection leads to an increase in only progesterone and pregnenolone levels, whereas the concentration of the other steroids remains low. The present data indicate that the stimulatory effect of prolactin at an early stage(s) of the testicular steroidogenic pathway remains relatively intact in the desensitized testis and leads to an apparent accentuation of the LHRH-agonist-induced enzymatic blockage at the level of 17-hydroxylase and 17,20-desmolase activities.

Key words: prolactin, LHRH, 17-hydroxylase, 17,20-desmolase, desensitization, steroidogenesis, LH receptor, prolactin receptor

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