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HUMAN CHORIONIC GONADOTROPIN BINDING TO RAT TESTIS RECEPTORS IS INHIBITED BY A THYMUS FACTOR. Hiriart, M. and Romano, M.C. Depto. de Fisiología y Biofísica. CINVESTAV-IPN. Apdo. Postal 14-740. 07000 México, D.F.

An interrelationship between immune and reproductive systems has been postulated, and involves bidirectional effects between gonads and thymus. Male gonads are affected by neonatal thymectomy and nude male athymic mices show abnormal testes. We have investigated the effect of thymus fractions on the ^{125}I-hCG binding to rat testis receptors. For that purpose we obtained a thymus acetonic powder of 14-day-old rats. The extract was separated by molecular sieve chromatography using a column of Ultrogel AcA 54. Fractions of 5 ml were collected. Gonadotropin LH-hCG receptors (R) were obtained of adult male rats. Testes were homogenized and sedimented at 20.000 x g. The pellet was resuspended in PBS at the appropiate dilution for the binding assays. When thymus fractions were assayed, they were added to tubes containing R plus ^{125}I-hCG and/or hCG in adequate quantities. A fraction corresponding to 28000 mol wt named thymus factor (TF) was found to inhibit the binding activity of ^{125}I-hCG to its testicular receptor in a dose response manner. By Scatchard analysis a competitive interaction between TF and hCG was found. The Ka values of hCG binding were diminished in the presence of TF. Present results suggest that a thymus fraction obtained from prepuberal animals modify the ^{125}I-hCG binding in the adult rat testis. (Ka values: Control group 2.2×10^{10} M^{-1}, TF treated group 7.3×10^{9} M^{-1}).

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Modification of the 3β-HSD activity by gonadotropins in the ovarian tissue

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It is well established that the effect of gonadotropin to the ovary to increase the output of steroids is due to a stimulation of cyclic AMP mediated ovarian cholesterol side-chain cleavage enzyme (CSCC) activity and to an increased transport of cholesterol to this enzyme. We have investigated whether gonadotropin also stimulates 5-ene-3β-hydroxysteroid dehydrogenase and 4,5-ene-isomerase (3β-HSD) activity in the ovary. Dispersed ovarian cells obtained from immature rats pretreated with PMSG were incubated for six hours with or without hCG. Upon completion of this first incubation, 14C-pregnenolone was added and incubated further for one hour. The 3β-HSD activity was expressed by the amount of radioactive 3-oxo-4-ene steroids formed. In vivo effect of hCG was assessed through similar experiments on ovarian cells obtained from immature rats injected with hCG, which had been pretreated with PMSG.
Addition of hCG to incubated ovarian cells increased the 3β-HSD activity significantly. In this experimental condition, synergistic effect of prolactin in vitro was noted.
The enzyme activity in ovarian tissue obtained from animals injected with hCG in vivo, increased 1.5 times 3 hours after the injection, while it more than doubled 6 - 9 hours after the injection. These results indicate that hCG has stimulatory effect on the 3β-HSD activity in ovarian tissue, and this may contribute to the increased output of progesterone from the luteinized ovary.