

73. EFFECTS OF PROGESTERONE ON THE FRAGILITY AND SHAPES OF HUMAN RED BLOOD CELLS

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Effects of progesterone (Prog) on human red blood cell (hRBC) membrane were investigated by a prompt hemolysis test with NaCl solution (140mOsm/kg) and by scanning electron microscopy (SEM). The fragility of hRBC was decreased as the concentration of Prog increased ($0.125 - 2.0 \times 10^{-4}M$). By a prolonged incubation with Prog ($0.5 - 2.0 \times 10^{-4}M$) in isotonic NaCl solution the hemolysis of hRBC was promoted. By SEM, Prog inhibited the formation of echinocytes in $0.5 \times 10^{-4}M$, transformed hRBC shapes from discocytes to cup-shaped cells in $1.0 \times 10^{-4}M$ and to spherocytes in $2.0 \times 10^{-4}M$. Other steroids, e.g. 17α -hydroxypregnene-3,20-dione, androstenedione, etc., had almost no effect. These results suggest that Prog can expand cell membranes owing to being inserted mainly into the interior half of the membrane bilayer and this phenomenon is abolished by a minor structural change of steroids as 17α -hydroxylation.

8. EFFECTS ON CNS AND ANTERIOR PITUITARY FUNCTION

74. THE HYPOTHALAMIC PITUITARY ADRENAL STATE IN PATIENTS WITH HEPATOSPLENIC SCHISTOSOMIASIS (H.S.S.)

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About 50% of Egypt's rural population are infected with schistosomiasis. Most of these patients develop H.S.S. leading to portal presinusoidal hypertension. Pre-pubertal infestation is associated with stunted growth and infantilism, whereas the postpubertal group shows asthenia, loss of libido and testicular changes. Although somatomedin activity was significantly low, the adrenal reserve in such patients was also low. We studied the state of the hypothalamic pituitary adrenal axis to explain these endocrine changes in 60 patients with H.S.S. (20 prepubertal, 20 pubertal and 20 postpubertal). Of these twenty had ascites. Fasting plasma cortisol was significantly low with a blunted response to I.V. Synacten challenge. Fasting plasma ACTH showed a non-significant elevation, though a significant subnormal response was obtained after lysine vasopressin stimulation. Plasma cholesterol was significantly low in all groups. Serum aldosterone was higher than normal in both the ascitic and dry groups. Serum potassium was low in both groups, while serum sodium was reduced only in the ascitic group. It is concluded that the hypothalamic pituitary adrenal function is deranged in patients with H.S.S., and that aldosterone is probably not responsible for the formation of ascites. Repercussions of these findings in clinical practice will be discussed.

75. ADRENALINE 'TURNOVER' IN HYPOTHALAMIC AREAS OF THE RAT DURING THE PROESTROUS 'CRITICAL PERIOD'. P.C.B. MacKinnon, M. Clement & C.R.Clark. Dept. of Human Anatomy, Oxford University, OX1 3QX, England.

The preovulatory surge of Luteinizing Hormone (LH) in the rat depends on the integrity of a neural signal (Everett & Sawyer, 1950), which in our colony extends from 2.00 to 5.00 pm ('critical period'; CP) and coincides with the start of the LH surge. The LH surge and ovulation can be prevented by the inhibition of adrenaline (A) synthesis at the time of the CP (Coen & MacKinnon, 1981). Therefore 'turnover' of A was measured in hypothalamic areas to which axons of adrenergic neurones situated in the brain stem project. Groups of rats (lights on 0600-2000h) were killed at different times over the proestrous CP and similar times of estrus. Further groups were injected at similar times with an inhibitor (SKF 64139; 50mg/kg) of the synthesizing enzyme for A, and killed 2h later. After decapitation, brains were mounted on chucks in dry ice and sectioned (250 μ m) in a cryostat at -12°C. Samples were punched (0.85mm i.d.) from the preoptic area (POA), perifornical area (PFA) and the arcuate nucleus-median eminence (AN-ME). Concentrations of A were measured by radioenzymic assay (Saller & Zigmund, 1978). 'Turnover' of A was significantly higher in the AN-ME (but not the POA or the PFA) at 2.30-4.30pm on pro-oestrus than at other times of the CP or on estrus. Oestrogen replacement (10 μ g OB) in rats ovariectomized on dioestrus resulted in levels of A 'turnover' in the AN-ME at projected proestrus and estrus which were similar to those of control proestrus and oestrous animals, but significantly different from levels in oil-injected ovariectomized rats. These results suggest that an acute increase in A 'turnover' in the AN-ME may subserve the proestrous CP neural signal.