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IN VITRO BINDING OF PROGESTERONE BY THE HUMAN ENDOMETRIUM DURING THE MENSTRUAL CYCLE AND BY HYPERPLASTIC, ATROPHIC AND CARCINOMATOUS ENDOMETRIUM*

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THIRTY-four specimens of human endometrium obtained in connection with hysterectomies (and some by diagnostic curettage) were examined for their progesterone-binding capacity by equilibrium dialysis against human albumin. From each specimen a representative piece was subjected to histological examination. Nine specimens represented the proliferative phase of the menstrual cycle, five the secretory phase, five atrophic endometrium and seven varying degrees of simple endometrial hyperplasia. Adenomatous hyperplasia was present in two cases. Six specimens represented endometrial carcinoma of varying degrees of differentiation.

The equilibrium dialysis system consisted of 1·0 ml of tissue homogenate (protein concentration 1 mg/ml or less) as inner phase and 10·0 ml of 0·025M Tris buffer in 0·45% NaCl as outer phase. [1,2-^{3}H]-Progesterone as a tracer and increasing amounts (0, 2, 5, 10, 30 ng) of cold progesterone were added to the outer phase at the beginning of the experiments. Dialysis was performed at 7°C in a horizontal shaker for 19 h, after which samples were taken and the percentage of progesterone bound in the inner phase was determined. Human albumin was then added to the outer phase in a concentration of 1 mg/ml and dialysis was allowed to continue for another 19 h, after which the percentage of progesterone bound was again determined. The albumin, the function of which was to remove any unspecifically bound progesterone, invariably lowered the progesterone binding. This lowering, i.e. unspecific binding, was most marked with early proliferative, atrophic, hyperplastic and carcinomatous endometria, and least in homogenates from the late proliferative and luteal phases of normal menstrual cycle endometrium. The specific progesterone-binding capacity of human plasma determined by this method was high as compared to that of the average endometrial samples. The proliferative phase samples showed considerable variation in binding capacity, the highest binding rates being from the late proliferative phase. The endometrial samples in the secretory phase had binding rates of the same order as the late proliferative samples and the variation was not marked. The atrophic endometrium showed no specific binding of progesterone. Hyperplastic endometrium showed marked variation in progesterone-binding capacity, but there was no correlation between the degree of hyperplasia and the progesterone-binding capacity. Carcinomatous endometrium also showed considerable variation in binding rates, and there appeared to be no correlation between the degree of differentiation and the uptake of progesterone.

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