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Morphologic and Quantitative Reaction of Ant. Pituitaries of Castrated Female Rats to Oestrin Injections.*

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It is well established in the literature that castration in the female rat results in an increase in the basophiles and their development into castration cells. However, there is considerable disagreement concerning changes in the eosinophiles. In recent quantitative studies Ellison and Wolfe¹ reported that castration in the mature female rat resulted in an early increase in the size and the relative percentages of the basophiles in the anterior hypophysis which reached an apex approximately 30 days after castration (Table I). At this time a few signet-ring castration cells appeared. From the 30th day of castration there was an increase in the relative level of the castration cells, while the percentages of the basophiles decreased. There was also a moderate increase in the percentage of the eosinophiles in 30- and 60-day castrates (Table I).

It is equally well established that the injection of oestrin prevents the changes which ordinarily occur in the basophilic elements after castration. The experiments recorded below were carried out in order to obtain statistical data on the action of oestrin on the anterior lobes of female rats castrated for periods of 30 and 60 days.

Seventy-one mature female rats castrated for 30 days and 30 rats castrated for 60 days were used. Twenty-eight of the 30-day castrates received 25 units of oestrin†‡ daily throughout the castration period while 12 of the 60-day castrates received similar injections for the last 30 days of the 60-day castration period. Vaginal smears were made throughout the injection period. Serial sections of the pituitaries were cut and cell counts made; their relative per-

* These studies were aided by a grant from the Division of Medical Sciences of the Rockefeller Foundation.

¹ Ellison, E. T., and Wolfe, J. M., *Endocrinology*, 1934, **18**, 555.

† The oestrus-inducing extract, Amniotin, was furnished by E. R. Squibb & Sons through the courtesy of Dr. J. J. Durrett.

‡ A group of 4 rats (30-day castrates) received 200 rat units daily of Progynon B for this period. The pituitaries of this group of rats were greatly increased in weight; the range was from 19 to 24 mg. The pituitary weights of the rats receiving smaller amounts of oestrin (Amniotin) were within the limits for normal female rats.

centages were calculated and are presented statistically in Table I. For non-castrate control material previous studies on the pituitaries of 143 normal female rats were utilized.

Analysis of table I shows that oestrin injections throughout the 30-day castration period either completely or incompletely prevented the increase in the number and the size of the basophiles. No castration cells were found (Table I). The degree of this prevention of castration changes was proportional to the degree to which the vagina was kept cornified. In many rats the relative percentage of the basophiles was even lower than that found in normal females (Table I). Most of the basophiles were small, regressive and devoid of granules. Oestrin injections also prevented the moderate increase in the percentage of the eosinophiles which ordinarily occurs following castration. Moreover, many of these cells were swollen and exhibited loss of granules. In such cells the negative image of the Golgi apparatus was often enlarged. The relative percentages of the chromophobes were increased (Table I). Many were greatly increased in size; in these large chromophobes as well as in many of the smaller the negative image of the Golgi apparatus was enlarged.

In the 60-day castrate rats receiving oestrin for the last 30 days of this period, the pituitary findings were similar to those in the injected 30-day castrates. Both basophiles and castration cells were found but at a much lower level than in the controls (Table I). The basophiles and, in some instances, the castration cells were small and regressive. The relative percentage of the eosinophiles was much lower than that found in the 60-day castrate controls and the mean level of these cells was slightly lower than that found in the non-castrate controls (Table I). Many of the eosinophiles exhibited loss of granules.

These studies indicate that oestrin injections prevent the differentiation of new basophiles which normally follows castration in the female rat. They fail to indicate the exact action of oestrin on the basophiles known to be present at the beginning of the injections. The moderate increase in the level of the eosinophiles which ordinarily occurs following castration is prevented and many of these cells show loss of granules.