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Ovaries of Immature Female Rats Receiving Pregnancy Urine Extract and Combinations of Pregnancy Urine Extract and Oestrin.*

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We have previously reported[1] that injections of large amounts of oestrin into mature female rats produced corpora lutea in the ovaries of these animals equal in size to those of pregnant rats. Similar results have been reported by Hohlweg[2] and Selye, Collip and Thomson.[3] Other experiments[3, 4, 5] have demonstrated that injection of oestrin simultaneously with A.P.L. (anterior pituitary-like substance) enhances the luteinizing capacity of A.P.L. and its capacity to increase the ovarian weights of immature rats. Hisaw and associates[6] and Lane[7] have demonstrated that injection of oestrin stimulated the production on the luteinizing hormone in the anterior hypophysis. The data presented below support the view that combined injection of oestrin and A.P.L. exerts a much greater effect on the ovaries of immature female rats than do injections of the A.P.L. factor alone.

In the first series of experiments a group of immature female rats received a single injection of 25 units of A.P.L.† They were killed 10 days later after no further treatment. A second group, littermate sisters to those above, received a single injection of A.P.L. and beginning on the fourth day following the administration of A.P.L. daily injections of 200 units of oestrin,‡ until the tenth day

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† Extracts of pregnancy urine, Follutein, were furnished by E. R. Squibb and Sons through the courtesy of Dr. J. J. Durrett.

‡ Progynon-B, the benzoic acid ester of dihyroestrin, was used. A portion of this material was furnished gratuitously by Dr. Erwin Schwenk of the Schering Corporation.

following the injection of A.P.L., at which time the rats were sacrificed. As controls for these experimental groups a group of untreated littermate sisters were used. In a second series of experiments a group of 31 immature female rats received daily injection of 25 units of A.P.L. for 10 days while a second group received the same amount of A.P.L. for the same length of time and in addition 200 units of oestrin daily for the last 6 days of the total experimental period of 10 days. At autopsy the body, ovary, and pituitary weights of all animals were obtained. After fixation and embedding serial sections of the ovaries and representative sections of the uteri and vaginae were cut and stained. The ovaries of all 4 experimental groups contained corpora lutea; none were found in the ovaries of the control rats. The relative size of the corpora lutea was determined by measuring the largest diameters of the corpora lutea in millimeters with a micrometer eye piece. The product of the 2 great diameters was calculated and the average of these products for the corpora lutea in the ovary was considered the size for the corpora in that ovary. The ovarian weights of the rats of the various groups and the products of the 2 greatest diameters of the corpora lutea are given in the frequency-distribution tables I and II. The mean weights of the ovaries and the mean

TABLE I.
Frequency Distribution Table Giving Range and Mean of Ovarian Weights in Experimental and Control Groups.

Frequency Intervals mg.	Controls	Single inj. 25 u. A.P.L. A.P.L.	Single inj. 25 u. A.P.L. A.P.L.-Oestrin	Daily inj. 25 u. A.P.L. A.P.L.	Daily inj. 25 u. A.P.L. A.P.L.-Oestrin
10- 14.9	1	2	—	—	—
15- 19.9	6	8	—	—	—
20- 24.9	3	5	1	—	—
25- 29.9	—	2	4	—	—
30- 39.9	—	2	4	1	—
40- 49.9	—	—	—	6	—
50- 59.9	—	—	1	6	—
60- 69.9	—	—	—	8	—
70- 79.9	—	—	—	7	1
80- 89.9	—	—	—	2	2
90- 99.9	—	—	—	1	3
100-109.9	—	—	—	—	3
110-119.9	—	—	—	—	6
120-129.9	—	—	—	—	4
130-139.9	—	—	—	—	3
140-149.9	—	—	—	—	3
150-159.9	—	—	—	—	2
160-169.9	—	—	—	—	1
170-179.9	—	—	—	—	—
Mean Wt., Mg.	18.5	21.8	32.7	72.8	119.6
Rats in group	10	19	10	41	28

measurements of the corpora lutea in the various groups are also given.

Table I shows that a single injection of 25 units of A.P.L. only slightly increased the weight of the ovaries. The ovaries of this group usually contained from 1 to 5 corpora which, with 2 exceptions, were very small. In most rats the products of the 2 diameters of the corpora were below 0.4 mm., while the mean for the whole group was 0.5 mm. (Table II.) In the animals in which daily injection of oestrin was given in addition to the single injection of 25 units of A.P.L. the ovaries were considerably increased in weight (Table I). While the corpora lutea were not increased in number they were greatly increased in size. For the whole group the mean product of the 2 diameters of the corpora lutea was 1.2 mm. (Table II), a mean increase in size of 140% when compared with the corpora in the previous group.

TABLE II.

Frequency Distribution Table Giving Range and Mean of the Relative Size (mean product of the greatest diameter) of Corpora Lutea in the Various Groups.

Frequency Intervals mm.	Single inj. 25 u. A.P.L.		Daily inj. 25 u. A.P.L.	
	A.P.L.	A.P.L.-Oestrin	A.P.L.	A.P.L.-Oestrin
.0- .4	10	—	2	—
.5- .9	7	2	29	—
1.0-1.4	2	5	2	28
1.5-1.9	—	3	—	4
2.0-2.4	—	—	—	—
Mean—mm.	.5	1.2	.7	1.3

The ovaries of the rats receiving daily injection of A.P.L. for 10 days were rather markedly increased in weight; the mean weight was 72.8 mg. and the range from 40 to 109 mg. (Table I). Although these ovaries contained many corpora lutea it is a point of considerable interest that their individual size was relatively small; the mean product of the 2 greatest diameters for the whole group was 0.7 mm. and in only 2 rats was this figure above 1 mm. (Table II). The ovaries of the rats which received 10 daily injections of A.P.L. plus daily injection of oestrin for the last 6 days of the experimental period were greatly increased in weight; the mean was 119.6 mg., the range from 70 to 169 mg. (Table I). The corpora lutea in these ovaries were markedly increased in size. The mean product of the 2 diameters for the entire group was 1.3 mm.; the range of variation is given in Table II.

Our studies would indicate that injection of oestrin simultaneously with A.P.L. augments the capacity of A.P.L. to increase the weight of the ovaries of test rats. This weight increase we believe

is due to the increased size of the individual corpora lutea in the ovaries of rats which received oestrin.

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Effect of a Previous Distention of the Intestine on Reflex Inhibition of Gastric Motility.*

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In studying the nerve pathways involved in the reflex inhibition of hunger contractions by distention of a Thiry fistula loop in the dog,[1] it was noticed that a previous long-continued distention of the loop brought about a lower threshold for the reflex.

In the experiments here reported, five animals were prepared with Thiry fistulae in the usual manner, the loops being 15-20 cm. long and taken from the upper ileum. After complete recovery the dogs were trained to swallow a stomach tube and to lie quietly on the table without any restraint. Gastric movements were recorded by the customary balloon-tambour method. The intestinal loops were distended by air inflation of a thin-walled balloon which was over-size relative to the lumen of the gut. The balloon was tied over a glass rod so that the expansion would be entirely lateral and the pressure readings would closely approximate the pressure actually applied to the intestinal wall. All records were made after a fasting period of 18-24 hours. In testing for inhibition of gastric motility the intestinal loops were inflated for a short period, usually 10-30 seconds. In sensitizing or reinforcing the reflex, the loops were subjected to a continuous pressure of 75 mm. Hg. for 24 hours, following which tests were again made.

The essential results may be seen in Table I and Fig. 1. In the control experiments pressures in the loops of 75 to 120 mm. Hg. produced inhibition of gastric movement in 25 out of 55 tests. Each dog responded about half the time, the percentage of responses increasing somewhat with the higher pressures. It was noted that hunger contractions of type 2 were most easily affected. Often there was a marked lowering of tonus with the presence of smaller contractions at this lower level. When pressures below

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