The cycles of adjacent sphincters are out of phase at all times so that the uterine musculature frequently gets a *little* blood through each, even during the detachment of the foetus and placenta. In so small an animal the loss of a little blood is serious. This mechanism conserves blood so well that free blood is hardly ever seen in the uterine lumen. The *localized* interruption of the blood supply of the uterus at a placental site may be one link in the chain of events initiating delivery.

7619 C

Anterior Pituitaries of Infantile Female Rats Receiving Injections of Pregnancy Urine Extract.*

J. M. WOLFE.

From the Department of Anatomy, Vanderbilt University School of Medicine, Nashville, Tenn.

Many investigators have demonstrated that injections of pregnancy urine or human placental extracts into immature (21-day or above) female rats result in an increase in the size of the ovaries due to follicular maturation and corpus luteum formation. However, subsequent studies of Selye and Collip[1] have revealed that injection of such extracts into infantile female rats (6 to 8 days) fails to cause follicular maturation and development of corpora lutea, but does result in a marked increase in the size of the thecal cells giving rise to thecal corpora lutea.

Collip and associates[2] have found that injection of placental extracts increases the size of the pituitaries of immature female rats (21 days or above) as well as the ovaries. We have confirmed these results, using both extracts of human placentae and pregnancy urine.†[3-5] Histologically, the pituitaries of these rats exhibited a

* These studies were aided by grants from the Committee for Scientific Research of the American Medical Association and from the Division of Medical Sciences of the Rockefeller Foundation.

[1] Selye, H., and Collip, J. B., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 647.

[2] Collip, J. B., Selye, H., Thomson, D. L., and Williamson, J. E., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 590.

† Pregnancy urine extract, Follutein, was furnished by E. R. Squibb & Sons through the courtesy of Dr. J. J. Durrett.

[3] Wolfe, J. M., Phelps, D., and Cleveland, R., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1092.

[4] Wolfe, J. M., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 812.

[5] Wolfe, J. M., *Am. J. Physiol.*, in press.

marked granular loss from the basophiles and a less evident loss of granules from the eosinophiles. Cell counts revealed that the percentages of the basophiles and eosinophiles were decreased, while that of the chromophobes was increased. Since it has been found that injection of pregnancy urine extract brings about a markedly different ovarian effect in infantile rats (6 to 8 days) it seemed of interest to study the anterior pituitaries of such rats.

Litters of female rats 6 days old were used, 2 or 3 animals of each litter serving as experimental animals, the rest as controls. The experimental rats received 25 units of pregnancy urine extract daily. Twenty-four hours after the 10th daily injection one experimental and one control animal were autopsied. The remaining experimental rats received 10 more daily injections and, together with their controls, were sacrificed on the 27th day of life, 24 hours after the 20th injection. Due to the small size of some of the litters, all the controls of this group were not littermates. A total of 64 rats was used. At autopsy, body, ovary and pituitary weights were obtained. The ovaries and accessory reproductive organs were fixed in Bouin's fluid and prepared for study, while the pituitaries were fixed in Regaud's fluid and stained by methods previously described.

The various weights are recorded in Table I. After 10 daily injections the ovaries of the experimental rats were increased to a mean weight of 13.4 mg., while that of the controls was only 6.1 mg. After 20 daily injections the ovaries of the experimental animals were increased to a mean weight of 62.4 mg., while the mean weight of the ovaries of the controls was 17.2 mg. These injections failed to increase the weight of the pituitaries of the experimental rats over those of the controls (Table I). This is in direct contrast to the findings when such injections are carried out in 21-day rats. Histologic examination of the ovaries of the experimental rats revealed that follicular maturation and corpus luteum formation had not occurred, but there was a marked hypertrophy of the thecal cells resulting in thecal luteinization. This process was usually well under way in the rats killed after 10 injections and was marked in the rats killed after 20 days.

Serial sections of all pituitaries were prepared for study and cell counts made. Comparison of the anterior pituitaries of the experimental rats, killed after 10 injections, with those of their controls, revealed that the level of the eosinophiles was practically the same in the 2 groups (Table I). In the controls the level of the basophiles was high and a great majority of the cells were well filled with

TABLE I.

The quantitative data pertaining to the percentages of the various cell types are given in a frequency distribution table. Class intervals are given in percentage. Mean rat, ovary and pituitary weights, as well as number of rats used, are given below.

Class Intervals %	25 U. Follutein daily—10 days		25 U. Follutein daily—20 days	
	Control	Exp.	Control	Exp.
Eosinophiles:				
30.-34.9	1	3	9	
35.-39.9	11	8	7	
40.-44.9	3	2	5	8
45.-49.9		3		4
Basophiles—Granular:				
0.-1.9		16		12
2.-3.9			1	
4.-5.9	2		2	
6.-7.9	6		8	
8.-9.9	7		10	
Basophiles—Non-granular:				
0.-1.9	12	5	9	5
2.-3.9	3	6	12	7
4.0-5.9		5		
Chromophobes:				
45.-49.9		1	3	
50.-54.9	6	4	7	
55.-59.9	9	3	11	4
60.-64.9		8		8
Total Rats per Group	15	16	21	12
Mean Rat Wt. (gm.)	29.1	28.6	50.2	54.2
Mean Ovary Wt. (mg.)	6.1	13.4	17.2	62.4
Mean Pituitary Wt. (mg.)	1.96	1.96	2.4	2.6

granules, while in the experimental rats the percentage of the basophiles was markedly decreased and those present were regressive and contained few if any granules. The chromophobes were slightly more abundant in the experimental rats. The quantitative data are given in Table I.

Comparison of the anterior pituitaries of the experimental rats, killed after 20 injections, with those of their controls shows that in the experimental animals the level of the basophiles was still very low and those present were practically devoid of granules. On the other hand, the level of these cells in the controls was much higher and a majority were well filled with granules. However, of greater interest was the high level of the eosinophiles in the injected animals of this group, which in every instance was above 40%. This was a moderate but a well defined increase over the level usually found in the controls (Table I). The eosinophiles in the anterior pituitaries of the controls and experimentals were morphologically similar, although in some of the experimental rats they were slightly larger and the negative image of the Golgi apparatus was more prominent.