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Gonadotropic Substance from Teratoma of the Testis.

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The demonstration of an increased excretion of gonadotropic hormone in the urine of patients with teratoma testis was made by Zondek.[1] He found that this hormone stimulated chiefly the follicles in the ovaries of rats and mice, although slight luteinization did occur at high dosages. He, therefore, concluded that it was identical with "Prolan A" in contradistinction to "Prolan B", the luteinizing hormone of pregnancy urine. Ferguson[2] recently reported 117 cases of teratoma testis with positive Ascheim-Zondek tests due to "Prolan A". On the other hand, Fluhman[3] and Hamburger[4] both found that in their cases of teratoma testis the hormone was similar to that occurring in pregnancy urine. Fluhman substantiated this conclusion on evidence of its ineffectiveness in hypophysectomized rats and on the results of his 5-10-day test.

Evans'[5] findings on a case of teratoma testis resembled those obtained with pregnancy urine in that his tests showed synergism with a pituitary extract. His material, however, resembled pituitary hormone in its *unlimited* effect on ovarian growth, confined to follicular stimulation. In a case studied by Main and Leonard[6] the pure follicular response was also obtained, but the hormone resembled that of pregnancy urine in its *limited* effect on ovarian weight with unlimited dosage.

We have had occasion to examine the urine of a case of teratoma testis with metastases. The presence of chorionepitheliomatous tissue was not mentioned in the biopsy report. The Ascheim-Zondek test assayed 10,000 rat units per liter. The ovaries of animals autopsied 96 hours after starting injections showed an apparent "Prolan A" reaction. The ovaries were white with several

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1 Zondek, B., Die Hormone des ovariums und des Hypophysenvorderlappens, Springer, Berlin, 1931.

2 Ferguson, R. S., *J. A. M. A.*, 1933, **101**, 1933.

3 Fluhman, C. F., *Am. J. Obs. and Gyn.*, 1934, **28**, 668.

4 Hamburger, C., Studies on Gonadotropic Hormones, Copenhagen, 1933, Levin and Munksgaard.

5 Evans, H. M., *et al.*, PROC. SOC. EXP. BIOL. AND MED., 1933, **31**, 21.

6 Main, R. J., and Leonard, S. L., *Endo.*, 1934, **18**, 629.

large clear follicles presenting themselves. On the microscopic examination of these ovaries, however, we were surprised to find only a slight difference from those treated with pregnancy urine, a "Prolan B" reaction. The structures which upon gross examination appeared to be follicles were, in reality, lutein cysts. There were also medium sized corpora lutea and thecal luteinization about the smaller follicles. We were impressed also with the tendency of our teratoma urine to form even more numerous lutein cysts than are found after the administration of pregnancy urine. A closer examination disclosed that the corpora were practically avascular, the cells were tightly packed with very few intervening capillaries, in contrast with the corpora formed by pregnancy urine where almost every cell is in contact with a capillary. This poor blood supply explained the white appearance of the ovary and the lack of the pink or reddish corpora one finds on gross examination of the ovaries after pregnancy urine injections in rats.

When this same urine was tested on guinea pigs, a massive thecal luteinization resulted, which was similar in all respects to that obtained with pregnancy urine.[7, 8]

In addition to its modified luteinizing effect in rats, our material resembled pregnancy urine in that it gave a limited ovarian response with increasing dosage, 150 units having no greater effect than 30 units. Furthermore, with the simultaneous injection of a pituitary extract rich in the synergist, we were able to demonstrate a marked augmentation in ovarian weight.

The urine from our case differed from pregnancy urine in that the uteri of the test rats were pale, heavy-walled with small lumina, in contrast to the hyperemic, fluid-distended uteri of rats injected with pregnancy urine.

Summary. The investigation of the urine obtained from a case of teratoma testis has yielded results similar to those obtained with pregnancy urine, except for the avascular corpora lutea, more numerous lutein cysts in the ovary, and a distinctly different uterine appearance. These differences from the typical pregnancy urine effect produce a gross appearance which may be mistaken for a "Prolan A" reaction. Consistent recourse to histologic examination may reveal more cases similar to our own, than is indicated by a perusal of the literature.

Granting the above possibility of error, it still seems necessary to explain the divergence of the results of various workers on the basis

[7] Loeb, L., *Endo.*, 1932, **16**, 129.

[8] King, A. G., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1182.

of the occurrence of more than one kind of hormone elaborated by the teratoma testis.

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Effects on Vascular-Renal System of Posterior Pituitary Extract Administered During Pregnancy.

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The parenteral or intranasal administration of extracts of the posterior lobe and pars intermedia of the pituitary body produces a decrease in the volume of the urine, an increase in the concentration of the urinary chloride, and a slight, if any, rise in the blood pressure.[1] The duration of these changes varies with the amount of the extract, but the magnitude of the response seems to bear no relation to the size of the dose.

Kamm and his coworkers[2, 3] have obtained two fractions from an extract of the posterior lobe of the pituitary gland—pitressin and pitocin. Pitressin contains the pressor and antidiuretic components, and its action is similar to the whole extract. Pitocin contains the oxytocic principle.

Shortly after the isolation of pitressin and pitocin, Ward, Lyon and Bemis[4] compared the action of these substances with pituitrin on pregnant women. They stated that pitressin and pituitrin produced an increase in the systolic blood pressure of 17 and 10 mm., respectively, which lasted for fifteen minutes. Pitocin caused an increase of only 5 mm., returning to normal in 5 minutes. Unfortunately, no attention was devoted to the water balance and the study of the blood pressure changes was inadequate.

Chipman,[5] Dieckmann, and undoubtedly other obstetricians have stated that the use of pituitrin to induce labor in pre-eclamptic patients has occasionally seemed to initiate the onset of convulsions. Convulsions and coma, of course, occur most frequently during

1 Stehle, R., *Am. J. Physiol.*, 1927, **79**, 289.

2 Kamm, O., Aldrich, T., Grote, I., Rowe, L., and Bugbee, E., *J. Am. Chem. Soc.*, 1928, **50**, 573.

3 Bugbee, E., and Simond, A., *Am. J. Physiol.*, 1928, **86**, 171.

4 Ward, G., Lyon, E., and Bemis, G., *Am. J. Obst. and Gynec.*, 1928, **16**, 655.

5 Chipman, cited by Ward *et al.*