

Vitamin E and Pituitary Hormone. I. Failure of Vitamin E Preparations to Induce Precocious Sexual Development.

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Verzár and his collaborators^{1, 2} observed that the extracts of wheat-germs containing vitamin E, when applied intraperitoneally or subcutaneously, bring about the same biological reaction as the hormone from the anterior lobe of pituitary gland, *i. e.*, oestrus and hypertrophy of the uterus (based on precocious activation of ovaries).

The purpose of our experiments was to reproduce Verzár's results and thus to use this phenomenon as a convenient means of standardization of vitamin E preparations,* and further to compare the activity of vitamin E with that of pituitary hormone and prolactin A. Three active vitamin E preparations were used, the potency of which was proved by the Evans-Burr method.

For testing vitamin E preparations (I and II) 3 groups (6 in each) of infantile female rats (30-35 days) were used. The first and second groups received daily intraperitoneally, for 14 days, 0.3 cc. of vitamin E preparations Nos. I and II, respectively. The third group serving as control received the same amount of olive oil. Experimental and control animals gained in body weight and seemed healthy. No external signs of stimulation of sex development such as hypertrophy and hyperemia of labiae vaginalis and opening of vagina were observed. On dissection also we found no signs of maturity, *i. e.*, neither ripening of follicles nor hypertrophy and hyperemia of uterus and tubes.

Similar tests were made with vitamin E preparations No. IIIa and IIIb. Three animals of the first group, and 2 of the second died after receiving 5 doses (0.3 cc.) while the other animals survived as many as 12 doses each. On the fifth day the animals were examined, killed and dissected. The experimental animals lost much weight, the skin of abdominal regions was wet, and the ab-

¹ Szarka, A., *Pflüger's Arch.*, 1930, **223**, 657.

² Verzár, F., *Pflüger's Arch.*, 1931, **227**, 499.

* The preparations were made for us (details not published by the Company) by the Pharmaceutical Department of the Chemical Manufacturing Co., Kolin, Czechoslovakia.

domen was distended showing that, when given intraperitoneally, these preparations were toxic. No signs of hastened maturity of sexual organs were observed, but rather a tendency of the uterus and tubes to atrophy.

Parallel with vitamin E experiments prolan A (from pregnancy urine) and hormone prepared from anterior lobe of hypophysis were tested. The preparations were administered subcutaneously as well as *per os*. In all cases enhanced maturity was observed, *i. e.*, ripening of follicles, opening of vagina and great hyperemia and hypertrophy of labiae vaginalis, uterus and tubes. In case of subcutaneous administration the reaction followed within 80-100 hours and the prolan preparations were active in very small doses, while in cases of peroral administration the reaction followed in 160-180 hours and was not so noticeable and larger doses were required.

We were unable to repeat Verzár's findings, and conclude that vitamin E does not induce sexual maturity as does anterior pituitary hormone and prolan A; this method therefore can not be used for standardization of vitamin E preparations.

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Vitamin E and Pituitary Hormone. II. Failure of Ant. Pituitary Hormone and Prolan A to Substitute Completely Vitamin E.

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In disagreement with reports of Verzár and his collaborators, results obtained by us¹ on young rats indicate that vitamin E has a biological action different from that of gonadotropic anterior pituitary hormone and prolan A. In a different type of test we have used mature female rats which were raised on vitamin E-free diet and have tested the capacity of gonadotropic pituitary hormone and prolan A to induce fertility in them as does vitamin E.

These rats, raised on vitamin E-free diet and all more than 3 months old, were divided (May 30) into 2 groups (I and II); both groups being left on vitamin E-free diet. Group I received twice a week 0.5 cc. of wheat-germ extracts as a source of vitamin

¹ *Proc. Soc. Exp. Biol. and Med.*, 1933, **31**, 58.