13145 P

Augmentative Effects of Estrogens and Chorionic Gonadotropin.*

C. F. FLUHMANN.

From the Department of Obstetrics and Gynecology, Stanford University School of Medicine.

It has been shown[1, 2, 3] that stilboestrol and estradiol dipropionate are able to stimulate increases in the ovarian weights of hypophysectomized rats, and that the concomitant administration of these substances with chorionic or equine hormone greatly enhances the gonadotropic effect. The present study demonstrates that a similar result may be obtained when estrogen is given to normal immature female rats prior to the injection of the chorionic gonadotropin.

A total of 93 immature female rats, 21 to 23 days of age, were used in this study. In each case the estrogen employed was dissolved in sesame oil and given subcutaneously in 0.1 cc dosages 3 times daily for 2 days, while the controls received the same amount of the plain oil. On the 3rd and 4th days the animals were given 3 daily subcutaneous injections of chorionic hormone in the amounts indicated in Table I. In one experiment A.P.L. (Ayerst, McKenna and Harrison) was used, and in the others an estrogen-free preparation (P.B.E.) made from blood of pregnant women as previously described.[4] The rats were autopsied on the 7th day. One group of 15 animals was given estrogen for 2 days in the manner described above, and was sacrificed on the 5th day without receiving the chorionic hormone.

The results are given in Table I. The injection of stilboestrol or alpha-estradiol dipropionate alone caused a slight increase in the weight of the ovaries, but this effect was not obtained with 6000 I.U. of a preparation of estrone (Theelin—Parke, Davis & Co.). A significant increase in the ovarian weights also was found when stilboestrol or estradiol dipropionate was given in high dosages previous to the administration of the chorionic hormone. This effect

* Supported in part by the Rockefeller Fluid Research Fund of Stanford University School of Medicine.

1 Williams, P. C., *Nature*, 1940, **145**, 388.

2 Pencharz, R. I., *Science*, 1940, **91**, 554.

3 Simpson, M. E., Evans, H. M., Fraenkel-Conrat, H. L., and Choh Hao Li, *Endocrinol.*, 1941, **28**, 37.

4 Fluhmann, C. F., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 1193.

TABLE I.

Estrogen or control substance	Chorionic hormone	No. of rats	Avg body wt	Uterus	Ovaries
Sesame oil 0.6 cc	A.P.L. 750 I.U.	6	41	.150	.034
Di-ovocylin* 0.12 mg	"	6	39	.115	.048
" 1.5 "	"	6	39	.121	.067
Amniotin† 1200 I.U.	"	6	45	.144	.040
Sesame oil 0.6 cc	P.B.E. 1.5 cc	5	50	.083	.016
Stilboestrol 1.5 mg	"	5	50	.080	.034
" 3.0 "	"	5	43	.084	.049
Sesame oil 0.6 cc	P.B.E. 1.5 cc	6	38	.067	.016
Stilboestrol 3.0 mg	"	6	42	.084	.044
" 6.0 "	"	6	43	.096	.057
" 9.0 "	"	6	38	.090	.045
Sesame oil 0.6 cc	P.B.E. 1.5 cc	5	51	.078	.021
Theelin‡ 1200 I.U.	"	5	48	.073	.027
" 6000 "	"	5	49	.087	.023
Di-ovocylin 1.5 mg	none	5	44	.119	.022
Theelin 6000 I.U.	"	5	38	.086	.013
Stilboestrol 9.0 mg	"	5	40	.117	.021
Uninjected controls		6	40	.037	.013

*Alpha-estradiol dipropionate (Ciba).
†Amniotin (Squibb); estrogenic substances.
‡Theelin (Parke, Davis); estrone.
I.U. refers to international unit of estrone.

is similar to that obtained with testosterone propionate,[5] and may point to an important difference between various estrogens since the increases with amniotin and theelin were comparatively slight.

Summary. The preliminary administration to immature rats of high dosages of stilboestrol or alpha-estradiol dipropionate produces a significant increase in the effect of chorionic hormone on the resultant ovarian weight.

[5] Fluhmann, C. F., *Endocrinol.*, 1941, **28**, 214.