CIII. THE INFLUENCE OF TESTICULAR HORMONE ON CRYPTORCHID RATS.

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(Received May 1st, 1933.)

In previous papers [see references Korenchevsky, Dennison and Kohn-Speyer, 1933] the influence of a testicular hormone preparation (isolated from human urine and highly purified) was studied on castrated and young normal rats. In the present investigation the same preparation was injected into cryptorchid rats, in whose testes all seminiferous tissue, except the Sertoli cells, is degenerate, while the Leydig cells appear to remain normal. Thus, the aim of the present experiments was to ascertain the effect of testicular hormone, when injected for a short period, on the weight of organs of animals, whose testes do not contain any normal seminiferous tissue except Sertoli's cells.

Technique.

13 rats belonging to 3 litters were made cryptorchid in the usual way [Korenchevsky, 1930]. Each litter was divided into a group of control rats (total 7 rats) and a group of injected rats (total 6 rats). The same technique was used, and the same preparation of Messrs Schering, Ltd.¹, was injected as in previous experiments [Korenchevsky, Dennison and Kohn-Speyer, 1933], the batch of extract being the same as that designated "II" and employed for litters 9 to 12 of normal rats and litters 1 to 4 of castrated rats. A large daily dose of 5 c.u. (as standardised by Messrs Schering, Ltd.) was injected for 10 days, in half doses twice a day. Such a dose produces quite definite changes both in castrated and normal animals. The final age of the rats, the age at which they were operated, and the final weights of the rats are given in Table I.

Table I. *Age and average weight of the cryptorchid rats in each group of each litter.*

No. of litter	No. of rats in litter	Age in days			No. of days after operation at beginning of injections	Final weight	
		At operation	When injections started	Final		Control rats g.	Injected rats g.
1	4	33	122	132	89	321	336
2	4	47	110	120	63	351	381
3	5	27	90	100	63	343	351

Influence on testes.

Without histological investigation it is difficult to estimate quite definitely the significance of changes in weight of cryptorchid testes, since these are usually more or less oedematous, and the weight of the testes varies according to the

¹ We wish to express our thanks to Messrs Schering, Ltd., for kindly supplying the preparation.

degree of oedema found. We always noted the condition of the testes. If the weights of those which were unusually oedematous were excluded from our calculations, we found that the testes of most of the injected rats were slightly smaller than those of the controls. The average percentage change in weight is shown in Table II.

Table II. *Influence on testes, prostate with seminal vesicles, penis and thymus.*

The average weights, actual and calculated per 200 g. of body weight, of the organs of the rats in each group of each litter and their percentage change after the injection of testicular hormone as compared with those of the control rats.

No. of litter	Actual weights			Weights per 200 g. of body weight		
	Control rats	Injected rats		Control rats	Injected rats	
	g.	g.	% change	g.	g.	% change
<i>Testes</i>						
1	0.734	0.800	+ 9.0	0.460	0.488	+ 6.1
2	1.334	0.755	- 43.4	0.762	0.397	- 47.9
3	0.978	0.612	- 37.4	0.565	0.346	- 38.8
Average	1.015	0.722	- 23.9	0.596	0.410	- 26.9
<i>Prostate with seminal vesicles</i>						
1	1.651	1.305	- 20.9	1.028	0.783	- 23.8
2	1.622	1.384	- 14.7	0.924	0.728	- 21.2
3	1.309	1.076	- 17.8	0.763	0.614	- 19.5
Average	1.527	1.255	- 17.8	0.905	0.708	- 21.5
<i>Penis</i>						
1	0.334	0.365	+ 8.7	0.209	0.219	+ 4.8
2	0.368	0.354	- 3.8	0.210	0.186	- 11.4
3	0.319	0.342	+ 7.2	0.186	0.195	+ 4.8
Average	0.340	0.354	+ 4.0	0.202	0.200	- 0.6
<i>Thymus</i>						
1	0.368	0.248	- 32.6	0.229	0.145	- 36.7
2	0.355	0.303	- 14.6	0.203	0.160	- 21.2
3	0.466	0.408	- 12.4	0.269	0.231	- 14.1
Average	0.396	0.320	- 19.9	0.234	0.179	- 24.0

Influence on prostate with seminal vesicles.

In all the injected rats, without exception, these glands were smaller than those of the control uninjected rats (Table II). Therefore, in spite of the smallness of the decrease in the weight, it may be concluded that the injections depressed the development of the prostate and seminal vesicles.

Influence on other organs, fat deposition and appetite.

Whilst the involution of the thymus (Table II) was slightly accelerated, no significant or constant changes were observed in the penis (Table II), adrenals, thyroid, hypophysis, liver, kidneys, spleen, heart or fat deposition; nor was any considerable effect noted in the rate of growth and appetite of the rats. The latter data, therefore, were not included in the tables.

DISCUSSION.

On the basis of the definite results obtained there is no doubt that a testicular extract, isolated from urine, which had a stimulating action on the sexual organs of castrated rats, had no stimulating effect on the sexual organs of

cryptorchids. On the contrary, a depressing effect, although slight, was noted on the prostate with seminal vesicles, and probably also on the testes.

On the average, the weight of the prostate with seminal vesicles of cryptorchid rats is usually slightly smaller than that of normal rats of a similar age [Korenchevsky, 1930]. For instance, in normal rats, whose age was similar to that of the rats of the present experiments, the weight of the prostate with seminal vesicles varied between 1.25 g. and 1.94 g. per 200 g. of body weight [Korenchevsky, 1930, Table IV, p. 629 and Table IX, p. 634]. In the present experiments these organs in the control uninjected rats weighed from 0.763 to 1.028 g. and in the injected rats from 0.614 to 0.783 g., *i.e.* considerably less than in the normal rats. It was, therefore, contrary to expectation to observe no stimulating effect of the testicular hormone in cryptorchid rats, as such a stimulating effect was always noted in castrated rats. The effect obtained was similar to that found with some doses of the hormone on the testes and on the prostate with seminal vesicles of young normal rats [Korenchevsky *et al.*, 1933, pp. 569, 570]. These results indicate the presence in the testicular extract isolated from urine of some property or substance inhibiting the development of sexual organs in animals. Such an inhibitory effect became evident when certain doses of extract were injected into animals possessing testes. The experiments performed do not indicate whether this inhibiting effect was due to the direct influence of the extract or to indirect influence of the extract through some endocrine organs.

SUMMARY.

1. In the experiments performed on 13 cryptorchid rats, a testicular hormone preparation, isolated from urine and injected subcutaneously, did not stimulate their sexual organs, but as judged by changes in weight of these organs had a slight inhibitory effect on the development of the prostate with seminal vesicles and probably also of the testes.

2. Under the influence of the injections the involution of the thymus was slightly accelerated.

A grant from the Medical Research Council and the hospitality of the Lister Institute have enabled us to carry out this work and to them our thanks are due.

REFERENCES.

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