INHIBITION OF HAIR GROWTH IN DOGS RECEIVING ESTROGENS*

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Leukopenia and anemia, accompanied by a myeloid aplasia, developed in dogs receiving large amounts of estrogens.[1] Equally marked changes of the myeloid tissues have not been reported in other species similarly treated. A second consequence of the injections of massive doses of estrogen into dogs, and possibly limited to this species in its extreme condition though apparent to some extent in monkeys, has been a cessation or inhibition of growth of hair.

Ten dogs, 5 females and 5 males, were used in the present experiments. All animals were pure bred fox-terriers from 2½ to 3 months of age at the time the experiment was started. One female and one male were reserved as controls and injected subcutaneously with 0.35 cc. of sesame oil, the solvent for the estradiol benzoate and testosterone propionate‡ used. The other 8 dogs received biweekly subcutaneous injections of estrogen and androgen as shown in the table. All dogs were fed a prepared food (K.F.S.) and evaporated milk. In addition, fresh beef and cod-liver oil were fed daily during the first six months. Adequate precaution was taken to prevent distemper. Significant irregularities in food consumption were not noted in any of the animals. The increment of growth during the experimental period varied, but all animals remained in excellent health throughout the periods considered.

The experiments with the female dogs were started approximately 9 months before those with the males and were primarily intended for the study of problems other than the growth of hair. Laparotomies were performed to expose the uterus before the injections were started and at intervals of from 5 weeks to 3 months during the course of the experiment.

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SUMMARY OF TREATMENT OF DOGS RECEIVING SEX HORMONE

Dog No.	*Period treated*	*Amount injected per week*		*Increase of weight during experiment*
		Estrogen micrograms	*Testosterone propionate mg.*	
1 ♀	577	333.3		1229
2 ♀	509	133.3		1215
3 ♀	580	.....		3281
4 ♀	472	333.3		1185
5 ♀	628	133.3 (21)*		1185
		533.3 (57)		
		7 mg. (7)		
11 ♂	733	166.6		1585
12 ♂	733	166.6	5	1337
13 ♂	690	166.6 (5½)		
		333.3		2755
14 ♂	733	166.6 (5½)	5	
		333.3	10	1540
15 ♂	733	.....		1985

* The figures in parentheses refer to duration of treatment in weeks.

At the time of the second laparotomy, 5 to 8 weeks after the experiment was started, the hair over the abdomen of the test animals which had been shaved at the time of the previous operation had not been replaced. The abdominal hair of the control dog had grown out so that the shaved area could not be identified. Four other laparotomies were performed on this control dog, each time the abdomen was shaved and each time the hair grew to its original condition. The abdominal hair of the four estrogen-treated animals was not replaced in the period of over one year during which they were observed. The hair follicles persisted, at least in part, and stubs of the shaved hairs were apparent.

The abdominal hair of these dogs was relatively thin, so observations were made on other sites. Four months after the experiment was started an area on the shoulder of each dog was clipped. The hair in these areas of the estrogen-treated dogs failed to grow during the following year. A second area posterior to the one mentioned was clipped 6 months after the experiment started. These areas likewise persisted during the following ten months. The clipped areas in the control dog could be identified only by close inspection 3 weeks later and could not be detected after one month.

The male dogs in the second series had figures cut in their coats

at the time the experiment was started. These figures persisted for over 22 months in three test animals. In one animal (Dog 13) the hair had largely regrown in 40 days, at which time the dose of estrogen was increased. A second clipped area persisted for over 20 months, at which time the experiment terminated. Areas of hair were clipped 3 times in the control dog and each time the hair was replaced.

Not only did the hair fail to grow over the shaved or clipped areas but the usual shedding of hair was greatly inhibited or largely prevented. Rubbing a moist hand over the coats of the control dogs regularly removed many loose hairs. Similar procedures with the injected animals, on the other hand, removed few or no hairs. However, with progressive treatment the hair of the experimental animals became thinner. Those areas in which the hair wears, such as the flanks, the anterior surface of the hind legs, and over the joints, were denuded though many hair follicles still contained the stubby hairs.

A thinning of the hair has been noted in some dogs showing hyperplastic endometritis and other changes clinically associated with this uterine condition,[2] changes which experiments have proved to be due to hyper-estrogenic stimulation.

Summary

Eight dogs (fox-terriers) injected subcutaneously with massive doses of estradiol benzoate or estradiol benzoate and testosterone propionate simultaneously failed to replace the hair of clipped or shaved areas for periods of up to 22 months during which the experiments were continued. Two control dogs, litter-mates to some of the experimental animals, regrew hair over clipped or shaved areas in one month or less.

References

1 Tislowitz, R.: Acta Brevia Neerl., 1938, *8*, 183; 1939, *9*, 17.
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2 DeVita, J.: J. Am. Vet. Med. Asso., 1939, *95*, 50.