

TESTICULAR DEFICIENCY DUE TO HYPOTHYROIDISM

Report of a Case

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The following case is presented to show the relationship of excreted androgens to various symptoms, including impotence, and because it appears to illustrate a relationship between hypothyroidism and the excretion of androgenic materials. The urinary androgens in all probability reflect fairly accurately the degree of hypogonadism which is present.

History: A white man, 50 years of age, was examined first in June, 1936. He complained of gradually increasing impotence and loss of sexual libido over a period of 18 months. There had been no infections of the genito-urinary tract in the immediate past or previously, no orchitis, and no severe general infections. His symptoms apparently could not be ascribed to exhaustion, since they had not improved following vacations and adequate rest. For six months impotence had been almost complete and no ejaculations had occurred under any circumstances. Energy and endurance were fairly good. He tended to be rather irritable, but otherwise there were no nervous symptoms and none suggestive of hypothyroidism.

The physical examination revealed an alert, healthy-looking man whose height was 73 inches and weight 166 pounds. His temperature was normal. The pulse rate ranged between 65 and 80 beats per minute. His skin was very slightly dry, although the color of the skin and the mucous membranes was good. He had a slight gingivitis. The blood pressure was 115 systolic and 80 diastolic. The prostatic secretion contained from 10 to 20 white blood cells per high power field and appeared normal. The prostate and the genitalia were apparently entirely normal. No other findings that seemed to have a bearing on the symptoms were noted.

Laboratory Tests: Urinalysis showed an occasional white blood cell and a faint trace of albumin. The red blood cells numbered 4,950,000, the level of hemoglobin was 97 per cent (Haden-Hauser), and the white blood cells numbered 8,900 with 75 per cent neutrophils, and 25 per cent lymphocytes. The level of the blood urea was 24 mg. per 100 cc. The level of the blood sugar was 98 mg. and of the blood creatinine 0.9 mg. per 100 cc. five hours postprandial. The blood Wassermann and Kahn tests gave negative reactions. A modified Friedman test which was done in May, 1936, showed a frankly positive test with four plus fresh corpora lutea in the test animals. A second Friedman test in October, 1936, gave entirely negative findings. An assay for

urinary androgens was made on April 28, 1936, by the chloroform extraction method.¹ This showed no comb growth in two birds tested. This test was repeated on May 15 and August 3, 1936; on each of these occasions the two birds tested showed 4, 2, 3, and 4 mm. comb growth respectively. By this method the normal average is about 10 mm. of comb growth. Roentgen examination of the sella turcica revealed no abnormalities.

Diagnosis: It appeared to us at that time that we were dealing with a case of functional hypogonadism since there were distinctly low androgen assays by the method used and these were associated on one occasion with an excess of urinary prolan. This was considered evidence of pituitary hyperfunction and was in keeping with the belief that hypogonadism was present.

Treatment and Progress: In June, 1936, treatment was begun with the administration of testosterone in oil*, each 1 cc. of oil containing 2.5 mg. of active material. Injections of 1 cc. were continued at the rate of about three times per week between June 10 and November 6. On this dose a little improvement was noted, although it was not striking—on July 21 erections appeared during the night for the first time in three or four months but no other change was noted. In August no further improvement had occurred. The patient complained somewhat of tiredness, but no other symptoms suggestive of hypometabolism were detected. In August, 1936, basal metabolic rates were found to average minus 32 per cent. One month later urinary androgens measured by a slight modification of the method of Koch^{2,3}, utilizing benzol extraction and five white leghorn capons as test objects, showed 3 international units of androgenic substance. This was at the time 2.5 mg. of testosterone were being given three times per week. This assay was repeated twice in October and showed 5.0 and 1.0 international units in the 24 hour specimens. Twenty-four hour specimens of urine from normal young men contain between 20 and 100 units by this method. In November, 1936, a modified Friedman test was again found to give a positive reaction, urinary androgens had risen to 39 units, and there was a slight decrease in symptoms.

On December 17, 1936, the basal metabolic rate was minus 25 per cent and on December 19 treatment was changed to testosterone propionate, 5 mg. being given three times per week. Within a few days there was a distinct increase in potency. This treatment was continued until February 3, 1937, with the exception of two weeks ending November 22. A specimen of semen was examined on February 2, 1937. The volume was 1.2 cc.; the total number of spermatozoa present was

* The androgens used in the treatment of this patient were Schering's Oreton made available through the courtesy of Dr. Erwin Schwenk, Dr. Max Gilbert, and the Schering Corporation.

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1,920,000; the motility of sperms was very slight. Study of stained smears indicated that about 20 per cent were morphologically abnormal. A single dose of 25 mg. of testosterone propionate was given on February 3 and 24 hour specimens of urine collected on February 3, 4, 5, 6, and 8 showed 65, 35, 20, 9, and 26 international units respectively. On February 9, the dosage of testosterone propionate was increased to 10 mg. three times per week and the impotence almost completely disappeared. This treatment was continued until June, 1937. The patient was seen again on May 27, 1937, at which time the basal metabolic rate was found to be minus 15 per cent. Injections were omitted for six weeks and it was found that 10 international units of androgens were being excreted. Within the month following discontinuance of androgen therapy he had noticed considerable exhaustion, he was somewhat dull mentally, the nails were rather brittle, and there was some paresthesia of the hands and feet. He had had relatively little impotence for nearly six weeks after discontinuing the injections, after which this symptom had returned. On May 27, 1937, desiccated thyroid was prescribed in a dose of 1 grain per day. The fatigue, mental dullness, and paresthesia disappeared promptly. The impotence disappeared almost completely and as much following the use of thyroid alone as it did on the injections of testosterone propionate.

In September, 1937, the basal metabolic rate was minus 23 per cent, androgen excretion had increased to 45 international units, the dose of desiccated thyroid was increased to 3 grains per day and in October, 1937, the basal metabolic rates averaged minus 5 per cent. The patient was almost entirely free from symptoms.

COMMENT

In this case the presenting symptom was sexual impotence. At first, a diagnosis of testicular deficiency was made on the basis of repeatedly low assays for urinary androgens associated with an excess of urinary prolan. Although the basal metabolic rate was decidedly depressed, there were no clinical symptoms which were highly suggestive of hypothyroidism and this diagnosis was postponed. Injections of testosterone propionate relieved the impotence when the dosage was adequate to raise urinary androgens to a range within normal. Discontinuance of treatment was followed by a fall in urinary androgens to low levels and recurrent impotence. Subsequently, distinct clinical evidence of hypothyroidism appeared and following treatment with desiccated thyroid alone, more marked clinical improvement was obtained with thyroid therapy only than was seen following treatment with androgens. This improvement was associated with a significant

rise in the level of the urinary androgens and a disappearance of impotence.

In the course of treatment the rate of excretion of androgens following the injection of testosterone propionate was tested. It appears from repeated assays that 25 mg. of testosterone propionate was excreted in three days. This provides a suggestion as to the frequency with which such injections should be made. The rise in androgen excretion on the fifth day following this injection suggests that the androgen production was depressed temporarily by this injection since normal individuals have been shown to respond in a similar manner following such treatment.

In conclusion it appears that in this case hypothyroidism caused impotence by the production of a secondary testicular deficiency.

REFERENCES

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