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## Sexual infantilism related to adrenogenital syndrome in conjunction with a chromosomal defect

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CONGENITAL ADRENAL hyperplasia secondary to a deficiency of the enzyme  $17\alpha$ -hydroxylase (Biglieri syndrome) is an unusual cause of primary amenorrhea and incomplete sexual development accompanied by hypertension.<sup>1</sup> No chromosomal anomaly has been previously described with this condition. We wish to report a case of  $17\alpha$ -hydroxylase deficiency associated with the deletion of the long arms of the X or an Xq- constitution.

D. B., 18-year-old white woman, had absent secondary sexual characteristics, primary amenorrhea, eunuchoidism (height, 68 inches; arm span, 71 inches), and significant hypertension (180/130 mm. Hg). She weighed 150 pounds. There was an S<sub>4</sub> gallop at the apex, but otherwise the physical examination was normal.

Results of laboratory testing included hematocrit, 42; total leukocytes, 6,500 per cubic millimeter with 41 per cent lymphocytes and mild eosinophilia (450 per cubic millimeter); electrolytes, normal. The cortisol level at 8 A.M. was 2.9  $\mu$ g per cent while the value at 4 P.M. was 2.3  $\mu$ g per cent. Serum luteinizing hormone and follicle-stimulating hormone were 47 and 50.5 mI.U. per milliliter (postmenopausal range, above 35 and 40, respectively).

Serum corticosterone was 64.8 ng. per milliliter (normal = 1 to 7.4 ng. per milliliter) and serum aldosterone was 50.4 ng. per 100 ml. (normal = 3 to 16 ng. per 100 ml.) on a 5 Gm. sodium diet. Plasma adrenocorticotrophic hormone was 150 pg. per milliliter (0 to 80 pg. per milliliter). Urinary  $17\alpha$ -hydroxycorticosteroids and  $17\alpha$ -ketosteroids were 1.5 and 2.8 mg. per gram of creatinine, while the pregnanediol and pregnanetriol levels were 7.5 and 0.5 mg. per 24 hours of urine, respectively (normal: pregnanediol, luteal phase, 2 to 5 mg; pregnanetriol, up to 1.3 mg. per 24 hours). Bilateral adrenal arteriography and venography were normal with approximately equal right (273.8 ng. per 100 ml.) and left (288.2 per 100 ml.) adrenal vein aldosterone levels. The electrocardiogram showed left ventricular hypertrophy and the skull x-ray showed a sella turcica with top normal volume. The chromosomal pattern is presented in Fig. 1 and demonstrates

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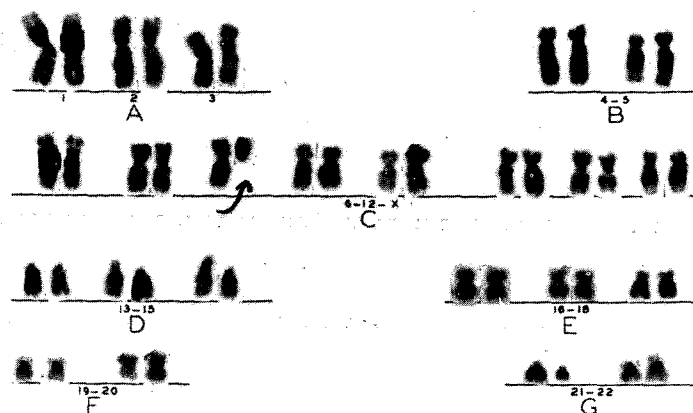


Fig. 1. Chromosomal pattern demonstrating Xq- constitution.

an Xq- sex chromosome constitution. Vaginal hormonal cytology revealed marked estrogen deficiency.

The amenorrhea, incomplete sexual maturation, and eunuchoidism may be secondary to dysgenetic gonads in view of the Xq- sex chromosome constitution or to a 17 $\alpha$ -hydroxylase deficiency with the inability to synthesize sex steroids. Diagnosis of this rare type of adrenogenital syndrome was determined, however, by the demonstration of low cortisol and 17-hydroxycorticosteroid levels while the urinary pregnanediol and the serum corticosterone values were elevated. In contrast to previous reported cases, the serum aldosterone was elevated; however, this would be expected from our knowledge of the steroidal pathways, and thus the cases with low aldosterone levels may have had a second defect in 18-oxidase enzymes necessary for conversion of corticosterone to aldosterone.

The association of a chromosomal defect has not been previously demonstrated in patients with the 17-hydroxylase deficiency. Possibly the gene for the 17-hydroxylase enzyme is located on the long arm of the X chromosome. The 18-oxidase enzyme gene(s) must be located elsewhere. The previous report of two siblings with this disorder, suggesting autosomal recessive inheritance, supports the contention that this chromosomal deletion is unique in this case.<sup>2</sup> Both the 17 $\alpha$ -hydroxylase deficiency and the Xq- chromosomal constitution are extremely rare and their chance association would be very unlikely.

#### REFERENCES

1. Biglieri, E. G., Herron, M. D., and Brust, N.: 17-Hydroxylation deficiency in man, *J. Clin. Invest.* **45**: 1946, 1966.
2. Mallin, S. R.: Congenital adrenal hyperplasia secondary to

17 hydroxylase deficiency—two sisters with amenorrhea, hypokalemia, hypertension, and cystic ovaries, *Ann. Intern. Med.* **70**: 69, 1969.