CASE REPORT

A Success Story in Congenital Adrenal Hyperplasia

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Received: 10 February 2011 / Accepted: 19 June 2012 / Published online: 14 March 2013
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Abstract Congenital adrenal hyperplasia (CAH) is a group of autosomal recessive disorders characterized by enzyme defects in adrenal steroidogenic pathways. CAH due to 21-hydroxylase deficiency accounts for 95 % of cases. This case was diagnosed to have simple virilizing type of CAH and started on dexamethasone, and underwent genitoplasty and clitoroplasty at 25 years of age, then was married 3 years after surgery and conceived spontaneously 2 years after marriage, to deliver a healthy male baby. Thus, proper diagnosis and treatment with steroids and genitoplasty can give females with CAH a normal sexual, normal menstrual, and reproductive function.

Introduction

Congenital adrenal hyperplasia (CAH) refers to a group of monogenic-inherited autosomal recessive disorders characterized by enzyme defects in adrenal steroidogenic pathways. Incidence varies according to the race, but is around 1 in 10–15 thousand live births [1]. It is the most common cause of sexual ambiguity at birth. CAH is clinically divided into classic CAH that includes salt wasting (SW), simple virilizing (SV), and non-classic (NC) disease. All three types are highly correlated with the spectrum of 21-hydroxylase mutations and to the severity of the disease. Fertility is reduced by various factors in patients with CAH. This case highlights that proper treatment of these females with steroids and surgery if required can give them normal sexual, menstrual, and reproductive function.

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Case Report

A 24-year-old unmarried female presented with clitoromegaly since birth, oligomenorrhea, and excessive hair on face and thigh since she was 16 years of age. There was no history of any hormonal intake, no history of abdominal mass, or no history suggestive of any salt-wasting crisis. There was no history of any medical or surgical illness. She had attained menarche at 16 years of age and had irregular scanty menses since then, with menses lasting for 2 days recurring every 2–4 months, with no dysmenorrhea. On an

average, she had four menstrual cycles per year. In her family history, she had three sisters (2 elder and 1 younger) and one brother. One of her elder sisters had similar illness and had undergone genitoplasty and vaginoplasty which had failed, and therefore later her younger sister who was normal was married to the elder sister's husband. No other family member is affected by similar illness. She was born of non-consanguineous parentage. She was educated till the tenth standard and was working as a security guard.

On examination, her height was 144 cm, weight 49 kg (BMI 23.6), and she had masculine built. She had breast—tanner II, pubic hair—tanner V. Her Ferriman Gallway score for hirsutism was 16. On local examination, she had clitoromegaly with clitoral length of 5 cm, clitoral index 750 mm [2]. Her labia were underdeveloped, and the labial fusion was more like the scrotal skin. Labial fusion with single common opening of urethra and vagina—Prader stage IV (Fig. 1).

On ultrasound pelvis, she had normal uterus with bilateral polycystic ovaries. Her karyotype was 46XX. On hormonal profile, her 17-OHP was markedly raised (>20 ng/ml), both free testosterone and DHEAS were raised into the male range. Basal cortisol was low, while other hormonal parameters were normal. On MRI of abdomen and pelvis, her bilateral adrenal glands were hypertrophied, with normal uterus and normal bilateral adnexa, clitoromegaly, and no ectopic testicular tissue. Thus, a diagnosis of congenital adrenal hyperplasia of simple virilizing type was made. Patient was started on dexamethasone 0.25 mg once daily and was planned for genitoplasty and clitoroplasty surgery. She was operated on Jan 15, 2005, an inverted U-shaped incision was given, and labia were reconstructed; nerve sparing clitoroplasty was also done to give her normal looking female genitalia (Fig. 2). She started having normal menses after starting treatment. She married 3 years later and had normal sexual life. She conceived spontaneously 2 years after marriage.

Fig. 1 Photograph showing the external genitalia of the patient

Fig. 2 Photograph showing the genitalia of the patient 3 months post surgery

She followed up regularly in the high-risk antenatal clinic and continued with dexamethasone 0.5 mg alternate day throughout pregnancy. She was diagnosed with impaired glucose tolerance and placenta previa type Ia at 32 weeks and was admitted. She underwent emergency LSCS at 35 weeks for preterm premature rupture of membranes with transverse lie. In the peri-LSCS period she was given hydrocortisone 100 mg intravenously 8 hourly. She delivered a 1.9 kg male baby with an apgar score of 9/9 at 1 and 5 min. Her postoperative course was uneventful. Baby had no gross anomalies and had normal 17-OHP level at day 3 of life. She had normal lactation.

Discussion

CAH has a wide spectrum of clinical severity depending upon the enzyme deficiency and the residual enzyme activity. Females with classic CAH, whether SV or SW type presents as ambiguous genitalia at birth, while the NC type presents later in life with primary amenorrhea, menstrual irregularities, hirsutism, and virilization. Diagnosis of CAH can be done prenatally by villous sampling or amniocentesis for mutational study or by amniotic fluid levels of 17-OHP. Prenatal diagnosis is especially important if both parents had carrier; previous affected child has limited role if the mother herself is affected and in steroid treatment. Diagnosis at birth is done by 17-OHP levels at day 3 of birth. In children and adults, the diagnosis is based on hormonal levels of 17-OHP, testosterone, DHEAS, androstenedione, cortisol, and plasma rennin activity. Treatment of SW type of CAH consists of glucocorticoids, mineralocorticoid (fludrocortisone) and genitoplasty, while the treatment of SV type of CAH consists of glucocorticoids and genitoplasty. Fertility is reduced in females of CAH because of various reasons like psychosexual

problems, decreased heterosexual activity, inadequate vaginal introitus, coital difficulties, chronic oligo-anovulation, secondary PCOS, and luteal phase defect. Fertility is also reduced in males with CAH because of testicular adrenal rest tumors causing oligospermia and leydig cell failure. Various studies have shown a fertility rate of 10–15 % in SW type, 35–60 % in SV type, and 65–90 % in the NC type of CAH patients [2]. This case also shows that late initiation of steroid therapy does not affect fertility as has been seen in other studies [3, 4]. Studies have shown that proper treatment results in spontaneous conception in patients with CAH. It has also been seen that females with CAH give birth to more girls (altered sex ratio seen)—66 females:34 boys—the exact reasons for this is not known [3, 4].

Conclusion

In utero and lifetime hormonal imbalances lead to multiple clinical challenges of CAH which requires a

multidisciplinary approach, but proper diagnosis and treatment can enable these females to have a normal sexual, normal menstrual, and reproductive life.

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