

**Original article****Epidemiology of hirsutism in Qassim region, KSA****S.R. Ahmed^{a,*}, A.A. Alzolibani^b, A.A. Al Robaee^b, H.O. Hamed^a, A. Settin^c**^a*Department of Obstetrics & Gynecology, Qassim College of Medicine, Saudia Arabia.*^b*Department of Dermatology, Qassim College of Medicine, Saudia Arabia.*^c*Department of Pediatrics & Genetics, Qassim College of Medicine, Saudia Arabia.*

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ABSTRACT

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Hirsutism is a common clinical condition that usually has a benign course. A genetic abnormality causing hirsutism is supported by the observation that different members of the same family are often affected. The goal of this study is to evaluate the genetic aspect of inheritance and consanguinity patterns of hirsute cases in Qassim region, Saudia Arabia. A total 83 hirsute patients were studied during one year duration. All patients underwent detailed history and thorough clinical evaluation. Ultrasonography and hormonal profiles were performed. The most common cause of hirsutism in this study was due to polycystic ovary (PCO) that was present in 52 patients (62.65%) followed by idiopathic hirsutism (IH) in 30 patients (36.14%) in addition to one case of late onset congenital adrenal hyperplasia. Acne was encountered in 34 (65.38%) of cases of PCO and in 13(43.33%) of cases of IH. Positive family history and consanguinity were encountered in 48(57.83%) and 49 (59.03%) cases respectively. Our study suggested that hirsutism is a familial disorder. Inheritance pattern appeared to be possible particular from the maternal followed by the paternal side of the family.

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1. Introduction

Hirsutism is a medical condition defined as excessive terminal (coarse) hair growth in females in a male-like pattern 1. Patients may show clinical signs of virilization such as male-pattern alopecia, acne, amenorrhea, and sometimes masculinization of the muscle mass, hypertrophy of vocal cords, or clitoromegaly 2, 3. Hirsutism may be associated with obesity, insulin resistance, diabetes, polycystic ovary syndrome (PCOS), hypertension, infertility, and menstrual irregularities 4, 5. Studies suggested that it affects between 5 percent and 15 percent of women, varying according to characteristics and at least 5 percent of women of reproductive age suffer from this problem. Hirsutism is usually a manifestation of an underlying endocrine disorder that results in androgen over activity. There are non-androgenic causes as well, though they are rare. The degree of hirsutism in different parts of the body is assessed by the Ferriman and Gallwey (F-G) score in which was established in 1961. Initially the scoring system was based on hair growth in 11 body parts but later it took into account nine areas(modified F-G score). Most experts opined that a modified F-G count of eight or above indicates hirsutism. Based on this score; it can be diagnosed as mild, moderate or severe 6-7. Hirsutism is a frequent reason for cosmetic embarrassment and perhaps a poor self-esteem all over the world. A disorder that results in significant psychological stress is often marked by a strong familial factor. A genetic abnormality causing hirsutism is supported by observation that different members of the same family are often affected.

The aim of this study is to evaluate the genetic aspects of the inheritance and consanguinity patterns of hirsute cases in Qassim region, Saudi Arabia.

2. Materials and methods

This study is a cross-sectional study in which all hirsute women aged between 18 and 40 years attending Outpatients Clinic of Maternity and Children Hospital, Burydah (Tertiary hospital) and Dermatology Clinics of College of Medicine, Qassim University were recruited. Between March 1, 2011, and February 29, 2012 a total 83 hirsute cases were evaluated. Exclusion criteria included all cases suffering from any chronic or acute diseases, women who were pregnant or breastfeeding, those who were on oral contraceptive pills or other drugs that could interfere with the hormonal and metabolic studies, and postmenopausal women. The Scientific and Ethical Committees of University and Ministry of Health approved the study protocol. In addition, an informed consent was obtained from each patient before the start of the work.

Detailed medical history was obtained from each patient using a questionnaire including age, age at onset of the disease, marital status, parity, history of diabetes mellitus, hypertension and any kind of medications. Menstrual history included age at menarche and the presence of menstrual irregularities. A careful family history of hirsutism was registered. Body mass index (BMI; weight/height²) was also measured.

A dermatologist examined the patients for clinical evidence of acne, androgenic alopecia, acanthosis nigricans (AN), and Seborrhea. The degree of hirsute was assessed using a modified Ferriman and Gallwey score 6 in which 9 body areas : face (upper lip ,chin and neck, chest, upper back, lower back, upper abdomen, lower abdomen, thighs, and upper arms) were scored from 0(no terminal hair growth observed) to 4(comparable to a hairy man). Hirsutism was classified as mild (score 8 – 16), moderate (score 17 – 24), and severe (score >24)7. Polycystic ovary (PCO) was defined according to the Rotterdam ASRM/ESHRE consensus, 2003, 8.

Hormonal profiles were assessed in all patients with hirsutism. Blood sampling was taken from cases during the early follicular phase of spontaneous or induced cycle. After overnight fasting for 10 – 12 hours, blood samples were collected around 8 – 9 AM to measure serum levels of follicular stimulating hormone (FSH), luteinizing hormone (LH), prolactin (PRL), total testosterone (Test), dehydroepiandrosterone sulfate (DHEA-S), 17- alpha-hydroxyprogesterone (17-OH-P), and fasting Plasma glucose (FPS).

Transvaginal ultrasonography (TVS) was performed to diagnose PCO or other ovarian pathology. However (TAS) was used to evaluate unmarried patients and to exclude or confirm other causes of hirsutism. PCO appearance, is the presence of 12 or more follicles measuring 2-9 mm in diameter, or increased ovarian volume(>10 mL) on ultrasound 9. The diagnosis of idiopathic hirsutism (IH) is applied only to hirsute patients with normal ovulatory function and circulating androgen levels 10.

Statistical analyses were performed by using SPSS version 19. The χ^2 test will be used for comparison between category variables and the Student's t-test for comparison of means between two continuous variables.

3. Results

During a one year study period, 83 hirsute cases were selected. The most common cause of hirsutism in this study was PCO in 52 patients (62.65%) followed by IH in 30 patients (36.14%) and one case of late onset congenital adrenal hyperplasia. Obesity (BMI ≥ 30 kg/m²) was found in 37 patients (44.57%). Table 1 showed the clinical characteristics of the two main etiological types of hirsutism. Thirty-four (65.35%) patients of PCO had menstrual irregularity and 21% had type 2 diabetes mellitus. Table 2 showed the mean \pm standard deviation of hormonal profiles. Mild modified F-G score was diagnosed in 65 patients (65.9% and 41.5% in both PCO and IH respectively). However moderate score was found in 15 (83.3%) cases of PCO. None of the patients had signs and symptoms of severe virilism.

Acne was encountered in 34 (65.38%) and 13(43.33%) cases of PCO and IH. A positive family history and consanguinity were encountered in 48(57.83%) and 49 (59.03%) respectively. Of all 83 hirsute patients 48(57.83%), 46(55.42%) and 30 (36.14%) reported a positive hirsutism in their sisters, mothers and third degree relatives respectively (Table 3, 4, 5).

Table 1

Clinical characteristics of patients with hirsutism.

	PCO (No=52)	Idiopathic (No=30)
Age (mean \pm SD)	31.634 \pm 6.184	32.4 \pm 8.698
BMI (mean \pm SD)	30.98 \pm 3.758	29.4 \pm 4.129
Menstrual irregularities N(%)	34(65.38%)	2(6.66%)
Primary infertility N(%)	17(32.69%)	7(23.33%)
Secondary infertility N(%)	10(19.23%)	2(6.66%)
Parity (mean)	3.125	4.52
Diabetes N(%)	11(21.15%)	4(13.33%)
Hypertension N(%)	4(7.69%)	1(3.33%)

Table 2

Hormonal assay of studied group.

	Mean \pm SD	Range
FSH	5.53 \pm 1.55	8.12
LH	8.90 \pm 3.91	14.85
LH/FSH ratio	1.72 \pm 0.78	2.80
Serum testosterone	1.89 \pm 1.62	6.45
DHEAS	4.750976 \pm 1.9531306	17.79100
Prolactin	676.92 \pm 368.99	2911.40
Cortisol	3.36 \pm 2.07	11.33
17 Hydroxy progesterone	3.36 \pm 2.07	11.33
Fasting blood sugar	6.096 \pm 1.45	6.60

4. Discussion

Hirsutism is not just a cosmetic condition, besides, the cases where a definitive cause is found; there are many for which a cause is unknown. These cases were often placed under the heading of idiopathic hirsutism, however researchers believed that genetic and receptor level functioning might play a part in many of these women 11. The threshold level for acceptable amount of excessive hair varies in different cultures. Some women with minimal degrees of hirsutism may be psychologically devastated, while others accept more severe forms without much concern 8. The prevalence of hirsutism is higher in Mediterranean and South Americans than Indians and Mongoloids 7-9. Some families were affected more than the others. The prevalence of hirsutism has been reported in 8% in the United States³ and in 10.5% in Kashmir, India 12.

Table 3

Modified F-G score and etiology of hirsutism.

		Diagnosis			
		PCO	Idiopathic	CAH	Total
Mild	Count	37	27	1	65
	% within modified F.G	56.9%	41.5%	1.5%	100.0%
	% within Diagnosis	71.2%	90.0%	100.0%	78.3%
	% of Total	44.6%	32.5%	1.2%	78.3%
Moderate	Count	15	3	0	18
	% within modified F.G	83.3%	16.7%	0.0%	100.0%
	% within Diagnosis	28.8%	10.0%	0.0%	21.7%
	% of Total	18.1%	3.6%	0.0%	21.7%
Total	Count	52	30	1	83
	% within modified F.G	62.7%	36.1%	1.2%	100.0%
	% within Diagnosis	100.0%	100.0%	100.0%	100.0%
	% of Total	62.7%	36.1%	1.2%	100.0%

Chi-square tests

	Value	Difference	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.259a	2	0.119
Likelihood Ratio	4.819	2	0.090
Linear-by-Linear Association	4.168	1	0.041
N of Valid Cases	83		

Table 4

Manifestations of hyperandrogenism and etiology of hirsutism.

	PCO(53)	Idiopathic (30)
Acne	34 (65.38%)	13 (43.33%)
Seborrhea	17 (32.69%)	7 (23.33%)
Male balding	9 (17.3%)	4 (13.33%)
Acanthosis nigricans	5 (9.61%)	2 (6.66%)

One of the most common causes of hirsutism is PCO, which was diagnosed in 62.65% of this study sample. This finding is in accordance with the figure of 62.5% in Iran 13, 60% in England 14, 75% in India 15, 53% in Mexico 16, and 70-78% in USA 5. However Gatee et al 17 reported a higher figure of the presence of PCO in 91% of 102 hirsute patients in the United Arab of Emirate and Atallah et al 18 of 82% in Saudi Arabia. A lower figure was reported by Erkkola and Ruutiainen who studied 229 patients in Finland and found evidence of PCO in 33%¹⁹. The discrepancy between these studies might be due to different races and sample size.

Idiopathic hirsutism (IH) was diagnosed in 36.14 % of our patients. The corresponding figure has been 35.2 % in Iran 13, 25 % in Mexico 16, 17% in India 15, 15% in USA 5, 11 % in Saudi Arabia 18, 5% in the United Arab of Emirate 17 and 38% in England 14 and in Finland 19. The difference between these figures reflects the variable extent of hormonal and metabolic studies 13. The prevalence of obesity in patients with hirsutism is different in various populations. Obesity was found in 37 patients (44.57%) of our sample cases. This is similar to reported figure of 51% in Saudi Arabia¹⁸. In a population studies 10% to 38% of women with PCO were found obese 20. Thus, the high prevalence of obesity in our patients may reflect an overall pattern of obesity in Saudi female population 18.

Table 5

Frequency of positive consanguinity and family history among studied hirsute cases.

	Total	PCO	Idiopathic hirsutism	P
Consanguinity				
+ve	49(59.03%)	26	23	0.043*
-ve	33(39.75%)	26	7	
Family history				
+ve	48(57.83%)	31	17	0.680
-ve	34(40.96%)	21	13	
Mother	46(55.42%)	35	11	0.014*
Sister	48(57.83%)	34	14	0.127
Maternal Aunts	16(19.27%)	11	5	0.784
Paternal Aunts	23(27.71%)	18	5	0.178
3rd degree relative	30(36.14%)	21	9	0.481

*p significant <0.05.

A positive family history and consanguinity were encountered in 48(57.83%) & 49 (59.03%) respectively. This finding is in accordance with the report of Habib et al 13, who found a positive family history in 56.2% of Iranian patient. Therefore, obtaining a family history might be speculated to be useful in finding the etiology of hirsutism 13. It was found that 48(57.83%), 46(55.42%) and 30 (36.14%) had hirsutism in their sisters, mothers & third degree relatives in our study respectively. There is a statistically significant difference between PCO & IH as regards positive family history of hirsutism among sisters and also with positive consanguinity. These findings are similar to that found by Habib et al 13, and Carey et al 21. Melissa 22 has also reported that approximately 50 % of mothers & sisters, 25% of maternal & paternal aunts, and 20% maternal & paternal grandmothers had hirsutism. These data were highly suggestive of an autosomal mode of inheritance. It was also hypothesized that hirsutism occurred in a familial basis 5 due to the familial clustering of some of its underlying etiologic factors as PCO and congenital adrenal hyperplasia 13. As seen in the literature and in our study many of the endocrine disorders resulting in hirsutism have strong genetic and familial predominance which may account for the variability among different populations 13. Heritability may also alter the factors regulating the development of hirsutism (e.g. androgen receptor activity, 5 α -reductase activity)21.

5. Conclusion

We might come to a conclusion that our study suggested that hirsutism is a familial disorder with an inheritance patterns that appeared to be possible from the maternal as well as from paternal side of cases. However, a large study might still be needed to confirm this issue.

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Competing interests

None of the authors had any potential conflict of interest relevant to this article was reported.

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