

## **Case study**

### **A Clinico-etiological evaluation of Hirsutism patients: A Case Series**

#### **Abstract**

**Background:** Hirsutism is a condition of excess hair growth in females in male-like distribution. It is seen in almost 5-10% of women. Women having hirsutism have a negative impact on quality of life.

**Aim:** All patients were subjected to ultrasound imaging (Sonography) and hormonal evaluation to establish possible causative factors.

**Method:** A prospective and retrospective study of hirsutism patients, who were evaluated at Samarpan medical research organization, Modasa, Gujarat from 2016 to 2019. The study protocol was approved by the Sarvajanic Clinical Research Ethics Committee at Mehsana (Ref. SCREC/2019-20/07).

**Results:** In this case series age and clinical presentation were studied in five female patients diagnosed with hirsutism. The patients age ranged from 16 to 22 years with a mean of 19.60 years. All these patients showed localized hair growth on the upper lip, chin, and cheek on the face. Ultrasound study revealed that one of the five patients had a right bulky ovary and four patients showed both ovaries with multiple follicles. In hormonal evaluation, in one of the three patients the LH: FSH ratio was found to be more than 3. Three out of the five patients showed elevated levels of 17-OHP and serum testosterone. Two out of the three patients showed an elevated level of serum insulin. The level of DHEAS, serum prolactin, serum cortisol, and serum TSH were found to be in a normal range.

**Conclusion:** Ultrasonographic (USG) study revealed a positive correlation between PCOS and Hirsutism patients. Hirsutism patients were found to have higher levels of 17-OHP, serum testosterone, serum insulin, and a higher ratio of LH: FSH, one or more at a time suggesting a strong correlation between elevated levels of these hormones and hirsutism. The present study could not establish any meaningful correlation between the level of DHEAS, serum prolactin, serum cortisol, and serum TSH.

**Key words:** Hirsutism, Ultrasound, hormonal evaluation

## **Introduction**

Hirsutism is defined as the presence of terminal coarse hairs in females in a male-like distribution.<sup>1</sup> It is seen in almost 5-10% of women and may be related to significant underlying endocrine disorders like PCOS, CAH, hypothyroidism and Cushing's syndrome.<sup>2</sup> Women having hirsutism have a negative impact on quality of life.<sup>3</sup>

Hirsutism can be androgen induced or non-androgen induced. Hyperandrogenism with hirsutism can be associated with various signs and symptoms such as Acanthosis Nigricans (AN), obesity, acne, virilization, Female Pattern Hair Loss (FPHL) and pelvic mass. Hirsutism is as male-pattern growth of terminal body hair in women in androgen-stimulated locations such as face, chest, and areolae. Hirsutism can be classified broadly into 2 groups viz. androgen induced, and non-androgen induced.<sup>3,4</sup>

Hirsutism can be idiopathic, meaning that the hair follicles are more receptive to normal circulating levels of androgens, or it can be caused by an excess of androgens and other hormones. The ovaries, adrenals, or greater peripheral conversion of weak androgenic hormones to more strong ones could all be sources of excess androgens.<sup>5</sup> Such as testosterone (T) and dihydrotestosterone (DHT), IH shows normal levels of androgens.<sup>6</sup> The most common reason for the excess androgen levels is PCOS and 60–80% of PCOS women suffer from hirsutism.<sup>7</sup>

Hence, it is important to evaluate every patient who complains of unwanted facial or body hair. In this study attempt has been made to analyze the underlying causes for hirsutism along with the associated clinical manifestations.

## **Methods:**

The study protocol was reviewed and approved by the Sarvajanic Clinical Research Ethics Committee at Mehsana (Ref. SCREC/2019-20/07). A retrospective study of 88 patients was conducted with various dermatological conditions at one dermatological clinic, Modasa, from

2015 to 2019. Clinical data was collected that included age at the onset of cutaneous symptoms leading to the diagnosis of various dermatological disorders.

In this case series age, locations, clinical presentation of hirsutism and pattern of extra hair growth and distribution was followed.

All the five patients were subjected to ultrasound imaging (Sonography) to examine the body's internal organs such as liver, ovaries, pancreas, gall bladder, spleen, kidney, bowel, uterus, and urinary bladder.

All the patients were subjected to estimation of different hormonal tests viz (Dehydroepiandrosterone (DHEAS), Serum prolactin, Serum cortisol, 17 $\alpha$ -hydroxyprogesterone (17- OHP), serum testosterone, Follicle stimulating hormones (FSH), Serum Insulin, Thyroid stimulating hormones (TSH) and luteinizing hormone (LH) to find out the possible correlation with hirsutism.

### **Results and discussion:**

Five female patients with hirsutism were identified from **monitoring** 88 patients with Dermatological disorders. The patients age ranged from 16 to 22 year with a mean of 19.60 years. *Neerja Puri at al.*, found a similar age distribution in her research of thirty hirsutism patients, with the majority (50%) being between the ages of 21 to 30 years.<sup>8</sup>

In these patients, neither any systemic disease nor any clinical symptoms were found except for hair on different parts of the body. All these patients showed localized hair growth on the upper lip, chin, and cheek on the face which is the characteristic of hirsutism. there were no epidermal changes in hirsutism area [Figure 1]. This compares well with study by *Navakumar at al.*, where majority of patients had mixed lip, chin, and body hair involvement and some had both lip and chin involvement.<sup>9</sup>

In current study, all five patients had mild to moderate hirsutism. These observations were similar *Ansarin H et al.*, (mild hirsutism in 65%, moderate in 32.5%, and severe in 2.5%).<sup>10</sup>

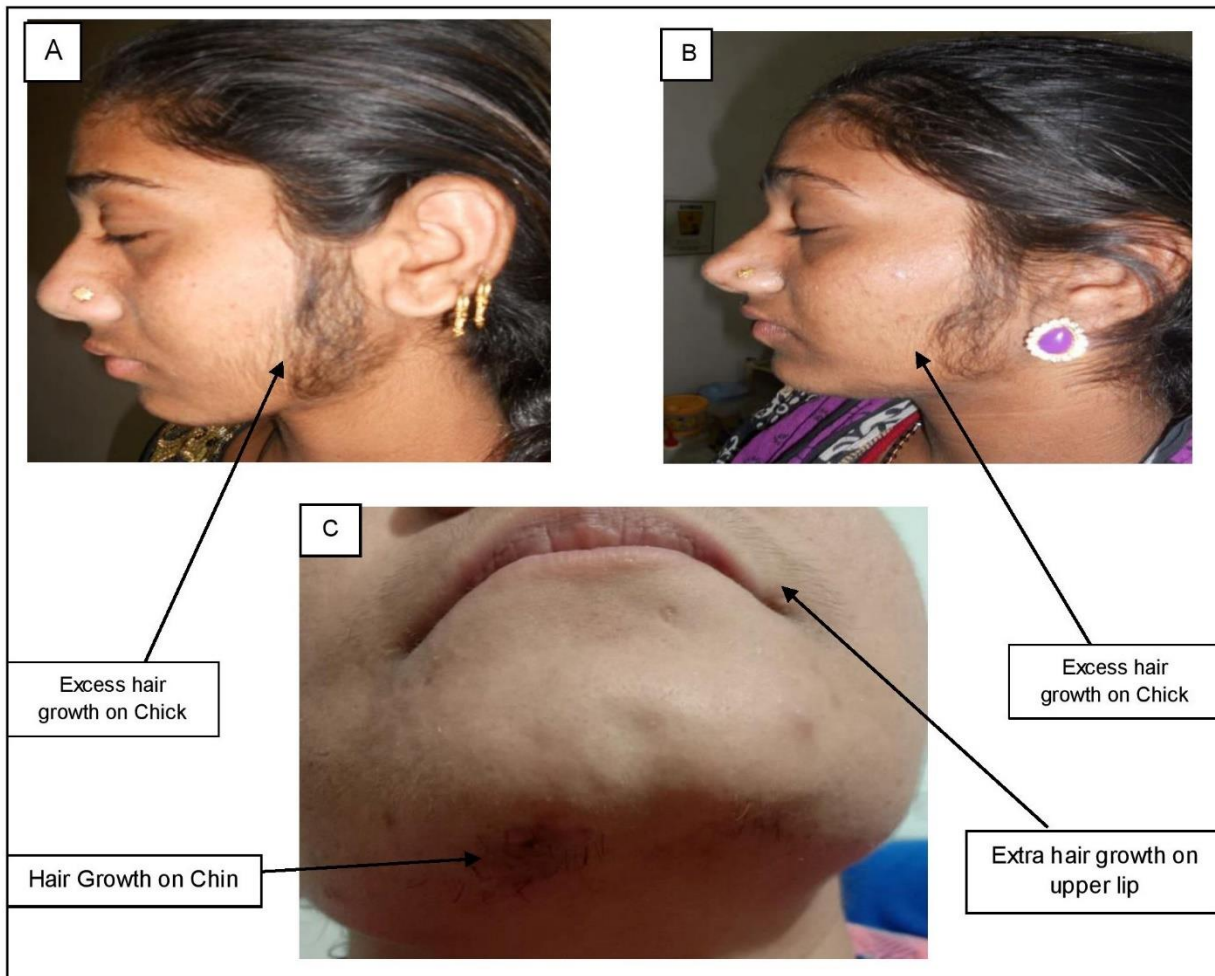
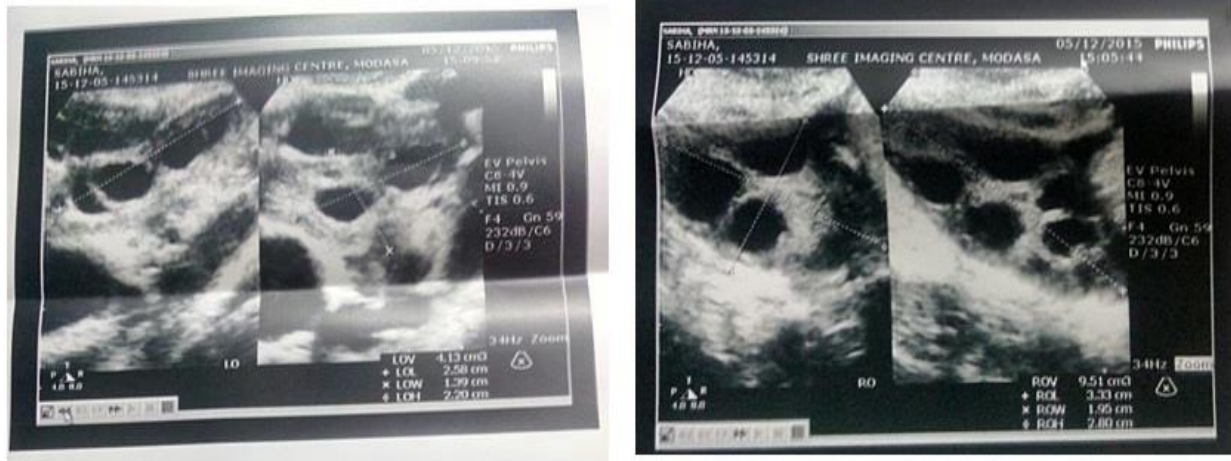


Figure 1 : Physical evaluation of Hirsutism patients on A. **cheek**, B. chin and upper lip

Ultrasonographic (USG) study revealed, One of the five patients showed right bulky ovary and four patients showed both ovary with multiple follicles. This study corroborated with observations reported by *Hassa H et al.*,<sup>11</sup>



**Figure: 2** Ultrasound sonographic evaluation of ovaries

### **Hormonal evaluation**

**Serum prolactin** level was found normal within range in all patients studied and hence the reported effect of serum prolactin on increasing level of free testosterone could not be determined. There is no direct correlation between prolactin and hirsutism. Hyperprolactinemia was seen in 12.5 % patients by *Soudabeh Tirgar-Tabari et al.*,<sup>12</sup>

**Pituitary hormones:** Elevated level of LH along with low or normal FSH is reported to increase the level of androgen presenting in hirsutism. The ratio of LH:FSH of more than 2 is indicating PCOS and suggestive of Hirsutism. In present study, in one out of three patients the ratio was found to be more than 3. However, all five hirsutism patients were found suffering from PCOS in sonographic study confirming strong relation between PCOS and Hirsutism. The findings correlate well with study of *Chhabra S at al.* where LH/FSH ratio was found to be raised in 78.57% hirsute patients with PCOS whereas LH/FSH ratio was raised in only 16.67% patients without PCOS.<sup>13</sup>

**Androgen:** Three out of the five patients showed elevated levels of 17-OHP and serum testosterone conforming their association with hirsutism. One out of five patients showed elevated levels of DHEAS, but level of 17-OHP and serum testosterone were within limit. This study partially tallied with the published literature. *H Hassa at al.*, who found that blood levels of DHEAS and 17-OHP were higher in Hirsutism patients when compared with control group<sup>14</sup>

and *Nand Lal Sharma at al.*, Polycystic ovaries were detected in 30% patients and 22% patients had elevated serum free testosterone levels.<sup>15</sup>

**Serum cortisol:** The level of cortisol found to be normal in all the five patients and no correlation was found between serum cortisol level and hirsutism. The finding did not conform to report of *Maroulis GB at al who found* elevated level of serum cortisol in 32 hirsutism patients.<sup>16</sup>

**Serum insulin:** Two out of the three patients showed elevated level of serum insulin that is known to present in PCOS with or without hirsutism. *Lumezi BG at al.*, study found, Insulin resistance in 14.8% women and diabetes in 1.4% women in hirsutism patients.<sup>17</sup>

**Serum TSH:** All five patients of hirsutism showed normal level of TSH, and no correlation was found between serum TSH and Hirsutism. The finding tallied with report of *Krishnendra Varma at al.*, in 30 patients thirty patients where TSH level was raised in 2(6.7%) and normal in 28(93.3%) patients.<sup>18</sup>

All data of patients are given in Table 1.

**Table 1: Different Hormonal parameters of hirsutism patients**

ID	S. Prolactin	LH	FSH	LH/FSH ratio	17-OHP	DHEAS	S. Cortisol	S- testosterone	S. Insulin	TSH
1	6.08	---	---	--	0.76	168.5	9.06	0.20	---	3.25
2	9.24	5.46	7.37	0.74	<b>1.36</b>	130.3	10.71	<b>0.87</b>	<b>54.47</b>	2.05
3	7.84	<b>22.46</b>	6.76	<b>3.32</b>	<b>1.83</b>	62.3	13.71	<b>1.92</b>	11.76	1.46
4	--	---	---	--	---	<b>385.7</b>	10.97	0.57	---	0.96

5	14.48	<b>0.72</b>	2.33	0.33	<b>1.87</b>	57.9	10.91	<b>0.69</b>	<b>213.49</b>	0.58
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LH (1.24 – 7.8 IU/L), FSH (4.7 – 21.5 mIU/ml), LH/FSH ratio (1 – 2 for normal and more than 2 increase), 17-OHP (0.20 – 1.03 ng/ml), DHEAS (51 – 321 µg/ml), Serum Cortisol (5 – 23 µg/ml), Serum Testosterone for adult (0.15 – 70 ng/ml), Serum Testosterone for age 11.8 – 18.6 yrs (0.15 – 40 ng/ml), Serum Insulin (2.6 – 37.6 µU/l), Serum TSH (0.5 – 5.0 mIU/ml)

### Conclusion:

Ultrasonographic (USG) study revealed positive correlation between PCOS and Hirsutism patients. Hirsutism patients were found to have higher level of 17-OHP, serum testosterone, serum insulin and higher ratio of LH:FSH, one or more at a time suggesting **strong** correlation between elevated levels of these hormones and hirsutism. Present study could not establish any meaningful correlation between the level of DHEAS, serum prolactin, serum cortisol, and serum TSH.

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