

## Original Article

### **SERUM PROLACTIN LEVELS IN WOMEN HAVING HIRSUTISM**

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#### **ABSTRACT**

**Objective:** To determine the relationship between serum prolactin levels and the severity of hirsutism.

**Methods:** A sample of sixty female subjects, aged 18-35 years, having hirsutism was selected, while ten normal healthy females were randomly included as controls at IMBB, the University of Lahore in 2014. All subjects underwent an assessment of excess terminal hair growth using the modification of the method originally described by Ferriman and Gallwey (FG). Hirsutism was classified as mild (score 8-15), moderate (score 16-25), and severe (score >25). Serum prolactin levels were assayed by ELISA technique. The significance of the difference between the groups was analyzed by independent samples Student's t-test and Pearson's correlation coefficient.

**Results:** Serum prolactin was significantly ( $p=0.000$ ) higher in mild hirsute and non significantly ( $p=0.062$ ) higher in moderate hirsute subjects as compared to the control subjects. The prolactin levels were non significantly correlated to mild hirsutism ( $r=0.072$ ,  $p=0.615$ ) and to moderate hirsutism ( $r=0.076$ ,  $p=0.846$ ).

**Conclusion:** Serum prolactin is raised in hirsute women, however, the relationship between serum prolactin and severity of hirsutism is not statistically significant.

**Key Words:** Hirsutism, Androgens, Prolactin.

## **INTRODUCTION**

Hirsutism refers to the presence of excessive coarse hair in androgen-dependent areas of the female body. Although hirsutism is commonly considered as an aesthetic problem, there is a high prevalence of androgen excess disorders among hirsute women. Although not all women suffering from an androgen-excess disorder have hirsutism, however depending on age, race, and ethnicity, 80–90% of hirsute patients will have a demonstrable androgen-excess disorder.<sup>1,2</sup>

Many scoring methods based on visual assessment of hair type and growth have been proposed. The modified Ferriman Gallwey score (mFG) proposed by Hatch et al. has now become the gold standard for the evaluation of hirsutism.

This method scores 9 of the 11 body areas (upper lip, chin, chest, upper and lower back, upper and lower abdomen, arm, forearm, thigh and lower leg) originally proposed by Ferriman and Gallwey (1961), excluding the lower legs and forearms, which are the areas sensitive to very low androgen concentrations even in healthy women.<sup>3</sup>

The main causes of hirsutism include excessive production of androgens by female adrenal glands and ovaries. Uncommonly, increased prolactin levels can also result in hirsutism. This study was carried out to investigate the relationship of prolactin with hirsutism in the local female population of Lahore.

## **METHODS**

This case-control study was conducted at the Institute of Molecular Biology & Biotechnology, University of Lahore, on 60 hirsute female subjects and 10 normal healthy females aged 18-35 years.

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Inclusion criteria comprised patients of hirsutism with a modified Ferriman-Gallwey (mF-G) score of eight or more, patients presenting with oligo/amenorrhea, ovulatory dysfunction, excess hair growth, virilization, alopecia, or acne.

Exclusion criteria included pregnant or lactating women, those who received oral contraceptive pills or/and other anti-androgen drugs in the previous three months, those who received drugs known to cause hirsutism or interfere with the hormonal studies. Patients with a modified Ferriman-Gallwey (mF-G) score of less than 8 were also excluded.

The study was approved by the Ethical Review Committee of the Institute of Molecular Biology & Biotechnology, University of Lahore.

All the subjects completed a standardized history and clinical proforma, including questions about age, family history of hirsutism, onset and duration of the disorder, marital status, menstrual cycle length and regularity, other illnesses, and medications.

The subjects also underwent an assessment of excess terminal hair growth using the previously described modification of the method originally described by Ferriman-Gallwey (i.e. mF-G), scoring the presence of terminal hairs over nine body areas (upper lip, chin, chest, upper and lower abdomen, thighs, upper and lower back, and upper arms). Hirsutism was classified as mild (score 8-15), moderate (score 16-25), and severe (score >25).

The blood samples for prolactin assay were obtained, after informed consent, by standard venepuncture technique; Three to four ml of venous blood was drawn from the cubital vein. The blood samples were centrifuged at 4,000 rpm and the serum samples were aliquoted and stored at -20°C until used. The hormone assay was done by ELISA technique.

The demographic variables were presented as simple descriptive statistics calculating mean and SD of numerical data like age, duration of the disorder, and modified

Ferriman-Gallwey (mFG) scores of hirsutism.

The significance of the difference between the groups was analyzed by independent samples Student's t-test and Pearson's correlation coefficient was determined to find out correlation. A p-value < 0.05 was considered statistically significant. All statistical analyses were carried out with SPSS version 17.

## RESULTS

Sixty hirsute female subjects enrolled in this study, had their ages ranged from 18-35 years with a mean± SD age of 24.58± 0.57 years. The control group had a mean± SD age of 25.6 ± 1.76 years. The statistical difference regarding the parameter of age between the two groups was non-significant (p = 0.13). About 72% of the subjects had the hirsute symptoms for shorter duration i.e up to maximum of 5 years and less. The rest had the disorder for more than 5 up to 14 years. The duration of the disease ranged from 1-14 years. A family history of hirsutism was positive in 12 (20%) patients. There was history of regular menstrual cycle in 47 patients (78.33%) and irregular menstruation in 13 patients (21.66%). Table 1.

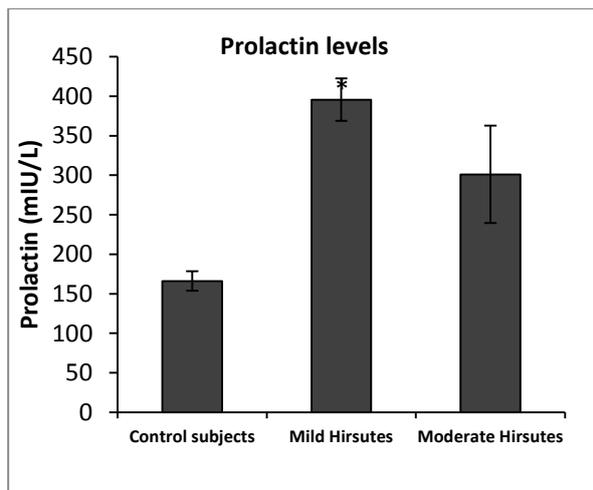
**Table 1.** General features of the hirsute subjects

Parameter	n	%	
Duration in years	1-5	43	72
	6-14	17	28
Menstrual cycle	Regular	47	78
	Irregular	13	22
Family history	Yes	12	48
	No	20	80

Serum prolactin levels were significantly (p< 0.05) higher in hirsute women as compared to that in controls. The level of the hormone was 58% (p=0.000) higher in mild hirsute and 44% (p=0.062) higher in moderate hirsute subjects as compared to the control subjects. Table 2 & Figure 1.

**Table 2.** Serum prolactin levels in the control group and hirsute group with mild and moderate hirsutism.

Group	No	Mean±SD Serum prolactin (mIU/L)	% Change to controls
Control	10	166.09±12.37	
Hirsute	Mild	395.68±26.91	58*
	Moderate	301.06±61.66	44

**Fig.1.** Serum prolactin levels in control subjects and hirsute subjects with mild and moderate hirsutism.

Serum prolactin levels were positively related to mild hirsutism ( $r=0.072$ ,  $p=0.615$ ) and to moderate hirsutism ( $r=0.072$ ,  $p=0.846$ ). However, the correlations were not statistically significant. Table 3.

**Table 3.** Correlation of serum prolactin levels with mild and moderate hirsutism

Prolactin	Correlation Coefficient (r)	p-Value
Mild Hirsutism	0.072	0.615
Moderate Hirsutism	0.076	0.846

(\* $p \leq 0.05$ . Statistically Significant)

## DISCUSSION

Perception of hirsutism is highly subjective, and hirsute women present with a wide variation in severity. Hirsutism is no longer a cosmetically disfiguring condition, but it can serve as a pointer to underlying hormonal and other systemic conditions. The rational differential diagnosis of this condition is therefore of much importance. Increased prolactin levels are amongst the rarer causes of hirsutism.

The direct action of prolactin on adrenal steroidogenesis has been reported.<sup>4</sup> Prolactin has receptors in all three layers of the adrenal cortex. Stimulation by prolactin is reported to increase adrenal androgens, dehydroepiandrosterone and dihydroepitestosterone sulfate as well as cortisol and aldosterone.<sup>5</sup>

In the present study, serum prolactin levels were found higher in the hirsute subjects. The comparison of mean values of mFG scores in patients with mild and moderate hirsutism and the control groups revealed significant differences. These results are comparable with the results of a study about the levels of prolactin with hirsutism in Bangladesh which showed increased prolactin levels in hirsute subjects.<sup>6</sup>

Similarly, another study in India found increased prolactin levels in hirsute women.<sup>7</sup> However, in a study in 1007 women with polycystic ovary syndrome, prolactin levels were found lower in patients as compared to controls.<sup>8</sup>

In our study, the prolactin levels were related to mild and moderate hirsutism. However, the differences among the groups were not statistically significant. Similar results were observed in a study carried out by Hertweck<sup>9</sup> et al in which no evidence of a statistical relationship was found between hirsutism score and prolactin. In another study by Zadehmodarres et al, statistical differences were found not significant regarding hirsutism and prolactin.<sup>10</sup>

Being a rarer cause and also because of a dearth of work, hyperprolactinemia needs to be probed further in the causation of hirsutism, especially in our local population.

## CONCLUSION

Serum prolactin is raised in hirsute women, however, its relationship with the severity of hirsutism is not statistically significant.

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