e-ISSN: 0975-9506, p-ISSN:2961-6093

Available online on www.ijpqa.com

International Journal of Pharmaceutical Quality Assurance 2025; 16(8); 247-250

Original Research Article

Association of Undiagnosed Hyperprolactinemia in Polycystic Ovary Syndrome: A Descriptive Cross-Sectional Case Study from a Tertiary Care Center in India

Piyali Das[1], Saikat Kumar Sarkar[2]

[1]Senior Resident, MBBS, MS (Obstetrics & Gynaecology), DNB (Obstetrics & Gynaecology), Obstetrics & Gynaecology, Rampurhat, West Bengal 731224

[2]Senior Resident, MBBS, MS (Obstetrics & Gynaecology), DNB (Obstetrics & Gynaecology), Department of Obstetrics & Gynaecology, Malda Medical College & Hospital, Malda, West Bengal 732101

Received: 25-06-2024 / Revised: 23-07-2025 / Accepted: 18-08-2025

Corresponding Author: Dr. Saikat Kumar Sarkar

Conflict of interest: Nil

Abstract:

Background: Polycystic Ovary Syndrome (PCOS) and hyperprolactinemia (HPRL) are two common endocrine disorders in reproductive-age women. The potential overlap between PCOS and HPRL can affect clinical presentation and management. This study aimed to investigate the association of undiagnosed hyperprolactinemia in women diagnosed with PCOS.

Methods: A descriptive cross-sectional study was conducted on 120 women diagnosed with PCOS as per Rotterdam criteria at Medical College Hospital, Kolkata. Serum prolactin, LH, FSH levels, and sociodemographic, clinical, and reproductive parameters were analyzed

Results: Hyperprolactinemia was detected in 45% of PCOS patients. A high LH:FSH ratio (≥3) and a positive family history of endocrine disorders were significantly associated with hyperprolactinemia (Adjusted Odds Ratio [AOR] = 6.27 and 21.90, respectively). No significant associations were observed between HPRL and BMI or specific clinical features such as hirsutism, acne, or menstrual irregularities.

Conclusions: A substantial proportion of PCOS patients had undiagnosed hyperprolactinemia. Routine prolactin screening is recommended for PCOS patients to optimize diagnosis and treatment pathways.

Keywords: Polycystic Ovary Syndrome; Hyperprolactinemia; LH/FSH Ratio; Infertility; Endocrine Disorders; Cross-Sectional Study.

Introduction

Polycystic Ovary Syndrome (PCOS) is the most common endocrine disorder affecting women of reproductive age, with a global prevalence of 5-10%. It is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology.

Hyperprolactinemia (HPRL), defined as an elevated serum prolactin level, can present with overlapping clinical features such as menstrual irregularities, infertility, and galactorrhea. The association between PCOS and HPRL has been reported since the 1950s, but the underlying pathophysiological link remains controversial. Some hypothesize a common hypothalamic-pituitary abnormality, while others consider this co-occurrence a chance finding due to the high prevalence of both disorders. This study aimed to explore the prevalence of undiagnosed hyperprolactinemia among women diagnosed with PCOS at a tertiary care hospital in India and to evaluate associated clinical and biochemical factors.

Materials and Methods

Study Design and Setting: A descriptive cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Medical College Hospital, Kolkata, India, between May 2021 and May 2022.

Participants: A total of 120 women aged 18-45 years diagnosed with PCOS based on Rotterdam criteria were enrolled after obtaining informed consent. Exclusion criteria included known adrenal or pituitary disorders, current treatment for hyperprolactinemia, and drug-induced hyperprolactinemia.

Study Variables

- Age
- Religion
- Marital Status
- BMI
- Clinical Feature
- Biochemical Parameter

Data Collection: Participants underwent detailed clinical evaluation, including sociodemographic data, menstrual history, BMI, and physical signs of hyperandrogenism (hirsutism, acne, alopecia).

Laboratory investigations included

- Serum Prolactin
- LH and FSH
- TSH and free T4
- Androgen levels

Transvaginal or transabdominal ultrasonography was used to assess ovarian morphology.

Statistical Analysis: Data were analyzed using appropriate statistical tests. Logistic regression was used to identify factors associated with hyperprolactinemia.

Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were calculated.

Results

Table 1: Demographic Characteristics of Study Participants (n = 120)

Study Participants	Characteristic	Number (%)	P-value
Age (years)	18–25	40 (33.3%)	0.08
	26–30	70 (58.3%)	
	31–35	10 (8.3%)	
Religion	Hindu	61 (50.8%)	0.72
	Muslim	59 (49.2%)	
Marital Status	Married	50 (41.7%)	0.41
	Unmarried	70 (58.3%)	
BMI	Overweight (25–29.9 kg/m²)	54 (45%)	0.35
	Obese (≥30 kg/m²)	56 (46.7%)	
	Normal (<25 kg/m²)	10 (8.3%)	

Table 2: Clinical Features of Study Participants

Clinical Feature	Number (%)	P-value (HPRL vs. No HPRL)
Oligomenorrhea	66 (55%)	0.28
Infertility	65 (54.2%)	0.35
Hirsutism	3 (2.5%)	0.88
Acne & Acanthosis Nigricans	28 (23.3%)	0.41
Abnormal Body Hair	36 (30%)	0.33
Hair Fall	43 (35.8%)	0.29

Table 3: Biochemical Findings

Biochemical Parameter	Number (%)	P-value
Hyperprolactinemia (HPRL)	54 (45%)	—
High LH:FSH ratio (>2)	83 (69.2%)	0.001
Positive Family History (PCOS/HPRL)	28 (23.3%)	0.001

Table 4: Factors Associated with Hyperprolactinemia (Multivariate Analysis)

Factor	Adjusted Odds Ratio (AOR)	95% Confidence Interval	P-value
High LH:FSH ratio	6.27	2.02 – 19.43	0.001
Positive Family History	21.9	4.56 – 105.12	0.001

Table 5: Association of Hyperprolactinemia with Clinical Parameters

Clinical Parameter	HPRL Present (%)	HPRL Absent (%)	P-value
BMI (Overweight/Obese)	48 (47.1%)	62 (52.9%)	0.35
Oligomenorrhea	30 (45.5%)	36 (54.5%)	0.28
Infertility	28 (43.1%)	37 (56.9%)	0.35
Hirsutism	1 (33.3%)	2 (66.7%)	0.88
Acne & Acanthosis Nigricans	12 (42.9%)	16 (57.1%)	0.41
Hair Fall	20 (46.5%)	23 (53.5%)	0.29

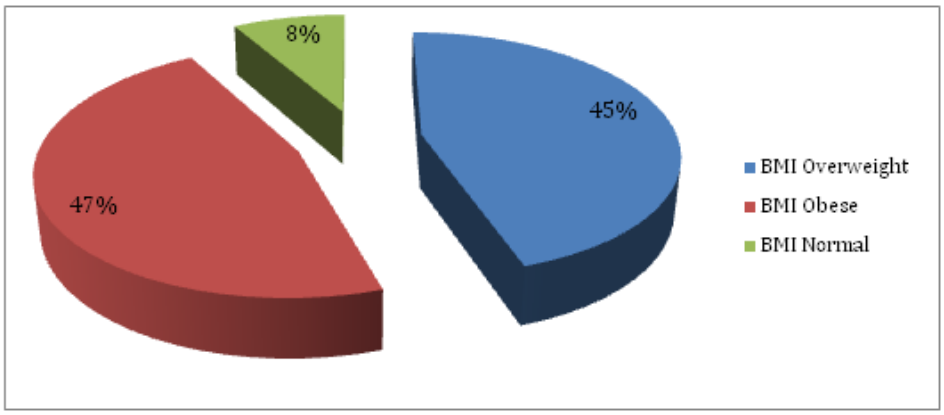

Figure 1: Distribution of Body Mass Index (BMI) Categories among Study Participants

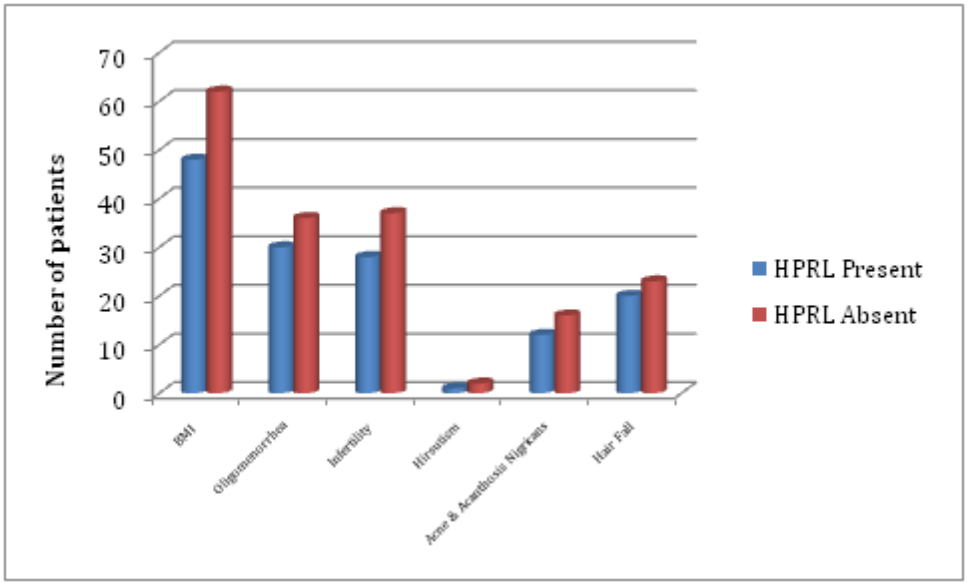

Figure 2: Association of Hyperprolactinemia with Clinical Parameters

A total of 120 participants were included in the study. The majority of participants were aged 26–30 years (58.3%), followed by 18–25 years (33.3%), and 31–35 years (8.3%), with no statistically significant difference across age groups ($p = 0.08$). Regarding religion, 50.8% were Hindu and 49.2% were Muslim, showing no significant variation ($p = 0.72$). In terms of marital status, 41.7% of participants were married while 58.3% were unmarried ($p = 0.41$). Analysis of body mass index (BMI) revealed that 45% of participants were overweight (BMI 25–29.9 kg/m²), 46.7% were obese (BMI ≥30 kg/m²), and 8.3% had a normal BMI (<25 kg/m²), with no significant differences observed among the BMI categories ($p = 0.35$).

Among the study participants, the most common clinical features observed were oligomenorrhea in 66 participants (55%) and infertility in 65 participants (54.2%). Other features included hair fall in 43 participants (35.8%), abnormal body hair in 36 participants (30%), acne and acanthosisnigricans in 28 participants (23.3%), and hirsutism in 3 participants (2.5%). When comparing participants with hyperprolactinemia (HPRL) to those without, none of these clinical features showed a statistically significant difference ($p > 0.05$ for all comparisons).

Among the participants, 54 (45%) were found to have hyperprolactinemia (HPRL). A high LH:FSH ratio (>2) was observed in 83 participants (69.2%), and a positive family history of PCOS or HPRL was reported in 28 participants (23.3%). Both the high LH:FSH ratio and positive family history were significantly associated ($p = 0.001$) with the studied conditions, whereas HPRL prevalence was reported descriptively.

Multivariate analysis revealed that a high LH:FSH ratio (>2) was significantly associated with the outcome, with an adjusted odds ratio (AOR) of 6.27 (95% CI: 2.02–19.43, $p = 0.001$). Similarly, a positive family history of PCOS or hyperprolactinemia was strongly associated, showing an AOR of 21.9 (95% CI: 4.56–105.12, $p = 0.001$).

When comparing participants with and without hyperprolactinemia (HPRL), 48 (47.1%) of those with HPRL were overweight or obese compared to

62 (52.9%) without HPRL (p = 0.35). Oligomenorrhea was observed in 30 participants with HPRL (45.5%) versus 36 without HPRL (54.5%, p = 0.28), and infertility was present in 28 participants with HPRL (43.1%) compared to 37 without HPRL (56.9%, p = 0.35). Other features, including hirsutism (33.3% vs 66.7%, p = 0.88), acne and acanthosisnigricans (42.9% vs 57.1%, p = 0.41), and hair fall (46.5% vs 53.5%, p = 0.29), also did not show statistically significant differences between the two groups.

Discussion

In this cross-sectional study of PCOS patients, 45% exhibited hyperprolactinemia, a prevalence consistent with prior literature. The high LH:FSH ratio and positive family history emerged as significant predictors of HPRL. While some studies suggest a shared hypothalamic-pituitary dysfunction may underlie this association, evidence remains inconclusive. The finding that BMI and overt hyperandrogenic symptoms were not linked to HPRL suggests that prolactin screening should be universally recommended in PCOS patients, regardless of clinical phenotype.

Limitations include the cross-sectional design, single-center setting, and lack of longitudinal follow-up. Additionally, macroprolactin was not systematically ruled out.

Conclusion

Undiagnosed hyperprolactinemia is prevalent in nearly half of women with PCOS in this cohort. Routine prolactin testing should be incorporated into the diagnostic workup of PCOS to ensure comprehensive management and improve fertility outcomes.

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