

A Retrospective Study on 212 Cases of PCOS in a Semi-Urban Subdivisional Hospital to Evaluate the Predictive Value of Prognostic Diagnostic Marker and Its Efficacy in Management

¹Anasuya Bhattacharyya, ²Sudarsan Saha, ³Biswajit Chakraborty, ⁴Prajna Saha, ⁵Abhijit Pahari

¹M.Sc. MLT in Biochemistry (2023 - 2024), Haldia Institute of Health Sciences, Haldia, Purba Midnapore

²Professor (Gynae and Obstetrics), IIMSAR, HALDIA, IIMSAR & BCRHH, Haldia, Purba Midnapore

³Associate Professor, HOD (Dept. MLT), Haldia Institute of Health Sciences, Haldia, Purba Midnapore

⁴PGT (Gynae and Obstetrics), IIMSAR & BCRHH, Haldia, Purba Midnapore

⁵Assistant Professor (Gynae and Obstetrics) IIMSAR & BCRHH, Haldia, Purba Midnapore

Corresponding Author

Anasuya Bhattacharyya

M.Sc. MLT in Biochemistry (2023 - 2024), Haldia Institute of Health Sciences, Haldia, Purba Midnapore

Article Received:10-03-2025

Article Accepted:28-04-2025

©2025 Biomedical and Biopharmaceutical Research. This is an open access article under the terms of the Creative Commons Attribution 4.0 International License.

ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS) is a multifactorial endocrine disorder with significant reproductive, metabolic, and psychological implications. The study aims to assess the predictive value of common diagnostic markers and their therapeutic efficacy.

Methods: A retrospective review of 212 PCOS cases diagnosed between January 2024 and December 2024 at a semi-urban subdivisional hospital was performed. LH/FSH ratio, serum testosterone, fasting insulin, HOMA-IR, BMI, and ultrasound findings were analyzed.

Results: Elevated LH/FSH ratio ($>2:1$) was seen in 62.2% of patients. Insulin resistance ($\text{HOMA-IR} > 2.5$) was found in 48.5%. Statistically significant correlations were observed between elevated LH/FSH and oligo/anovulation ($p < 0.01$). Combination of lifestyle modification and Metformin showed highest clinical improvement rate (72%).

Conclusion: LH/FSH ratio and HOMA-IR are strong prognostic markers. Early identification improves therapeutic response and long-term outcomes.

Keywords: PCOS, LH/FSH ratio, HOMA-IR, Metformin, Diagnostic markers, Retrospective study.

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a prevalent endocrinological disorder affecting 8-13% of women of reproductive age. Its presentation is heterogeneous, ranging from menstrual irregularities and hyperandrogenism to metabolic abnormalities. The Rotterdam Criteria (2003) continue to be widely adopted for diagnosis. However, the variability in clinical expression calls for evaluation of prognostic markers that can predict disease severity and therapeutic outcomes, especially in semi-urban populations with unique lifestyle and healthcare access patterns.

This retrospective study aims to evaluate the predictive value of common diagnostic markers and assess their management efficacy in a cohort of 212 patients from a semi-urban subdivisional hospital.

METHODS

Study Design and Setting:

Retrospective observational study conducted in the Department of Obstetrics and Gynecology at a semi-urban subdivisional hospital from January 1, 2024 to December 31, 2024.

Sample Population:

212 female patients aged 13-35 years diagnosed with PCOS using Rotterdam Criteria.

Inclusion Criteria:

- Clinical signs of hyperandrogenism
- Oligo/anovulation
- Polycystic ovarian morphology on ultrasound

Exclusion Criteria:

- Thyroid dysfunction
- Hyperprolactinemia
- Congenital adrenal hyperplasia

Data Collection:

Collected data from hospital records included demographic data, BMI, clinical features, hormonal assay (LH, FSH, testosterone), fasting insulin, glucose, HOMA-IR, ultrasound findings, and treatment response.

Statistical Analysis:

Descriptive statistics, Chi-square test, and Pearson correlation were used. SPSS v26 was utilized. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Demographic and Clinical Features (n=212)

Parameter	Mean ± SD / Percentage
Age (years)	23.4 plus/minus 4.2
BMI (kg / (m ^ 2))	27.1 plus/minus 3.5
Oligomenorrhea	71.2%
Clinical hyperandrogenism	56.6%

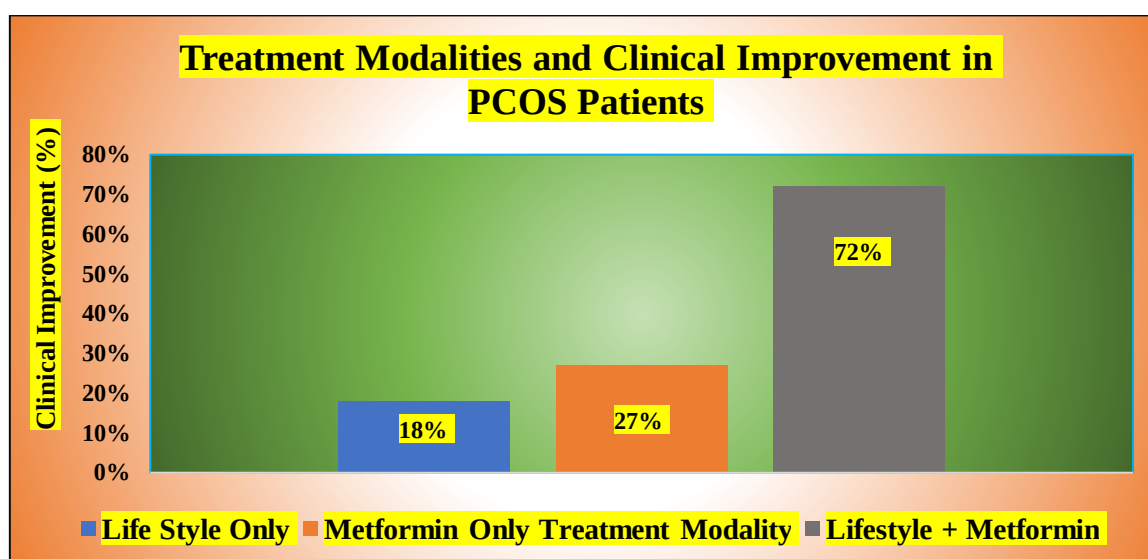
Table 2: Hormonal and Metabolic Parameters

Marker	Mean ± SD	Abnormal (%)
LH/FSH Ratio	2.3 ± 0.9	62.2%
Serum Testosterone (ng / mL)	78 ± 14	48.1%
Fasting Insulin (μIU / mL)	16.5 ± 6.2	44.3%
HOMA-IR	2.7 ± 1.1	48.5%

Table 3: Ultrasound Findings (n = 212)

Finding	Frequency (%)
Bilateral polycystic ovaries	62.7%
Unilateral polycystic ovary	19.8%
Normal appearing ovaries	17.5%

Chart 1: Treatment Modalities and Response Rates



DISCUSSION

Our findings reaffirm LH/FSH ratio and HOMA-IR as reliable prognostic markers in PCOS. While 62.2% had elevated LH/FSH, nearly half exhibited insulin resistance. This emphasizes the dual reproductive-metabolic axis in PCOS pathogenesis.

The high clinical improvement (72%) in the group managed with both lifestyle changes and Metformin supports the integrative approach in semi-urban settings where patient compliance is variable. Ultrasound findings, though supportive, showed limited standalone predictive value in treatment response.

Limitations include retrospective design and lack of long-term follow-up data.

CONCLUSION

This study underscores the predictive utility of LH/FSH ratio and HOMA-IR in PCOS management. Early stratification based on these markers can streamline interventions and improve prognosis, especially in resource-limited semi-urban hospitals.

REFERENCES

1. Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to PCOS. *Hum Reprod.* 2004;19(1):41-7.
2. Azziz R, et al. The prevalence and features of the PCOS in an unselected population. *J Clin Endocrinol Metab.* 2004;89(6):2745-2749.
3. Diamanti-Kandarakis E, et al. Insulin resistance and polycystic ovary syndrome. *Endocrine.* 2006;30(1):13-17.
4. Legro RS, et al. Diagnosis and treatment of PCOS: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* 2013;98(12):4565-4592.
5. Teede HJ, et al. Recommendations from the international evidence-based guideline for the assessment and management of PCOS. *Hum Reprod.* 2018;33(9):1602-1618.