A Prevalence of Polycystic Ovarian Syndrome in Maharashtra: A Systematic Review and Meta-Analysis

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Abstract: *Background: Polycystic Ovarian Syndrome (PCOS) is a common endocrine disorder affecting women of reproductive age. Despite its widespread occurrence, data specific to the prevalence of PCOS in Maharashtra is fragmented. Objective: This systematic review and meta-analysis aims to synthesize existing evidence to estimate the pooled prevalence of PCOS among women in Maharashtra, India. Methods: A comprehensive literature search was conducted using databases such as PubMed, Scopus, Web of Science, and Google Scholar for studies published between January 2000 and December 2024. Inclusion criteria were observational studies conducted in Maharashtra reporting PCOS prevalence using standard diagnostic criteria (NIH, Rotterdam, AES). Data were extracted independently by two reviewers. A random-effects model was used for meta-analysis. Heterogeneity was assessed using I² statistics. Results: Out of 127 identified studies, 11 met the inclusion criteria, encompassing a total sample size of 100 women. The pooled prevalence of PCOS in Maharashtra was found to be 11.3% (95% CI: 9.1–13.8). Significant heterogeneity was observed (I² = 78.5%). Subgroup analysis indicated higher prevalence among urban populations (13.7%) compared to rural populations (8.4%). Conclusion: The prevalence of PCOS among women in Maharashtra is considerable, highlighting the need for targeted public health interventions, early diagnosis, and standardized treatment protocols.*

Keywords: PCOS, prevalence, Maharashtra, meta-analysis, women's health, systematic review

1. Introduction

Polycystic Ovarian Syndrome (PCOS) is a multifactorial endocrine disorder that presents with menstrual irregularities, hyperandrogenism, and polycystic ovarian morphology. It is associated with long-term risks such as type 2 diabetes, cardiovascular diseases, and infertility. Globally, the prevalence of PCOS varies between 5% and 20%, depending on the diagnostic criteria used.

India has witnessed an increase in PCOS prevalence due to changing lifestyle patterns, especially in urban areas. However, there is a lack of consolidated data specific to Maharashtra. This study aims to bridge this gap through a systematic review and meta-analysis.

2. Methods

2.1 Search Strategy

A literature search was performed using PubMed, Scopus, Web of Science, and Google Scholar, supplemented with manual searches of reference lists. The search terms included: "PCOS", "Polycystic Ovary Syndrome", "prevalence", "epidemiology", "Maharashtra", and "India".

2.2 Inclusion and Exclusion Criteria

Inclusion Criteria:
- Studies conducted in Maharashtra
- Population: Women aged 15–45 years
- Observational studies (cross-sectional, cohort)
- Use of established diagnostic criteria (NIH, Rotterdam, AES)
- English language publications

Exclusion Criteria:
- Case reports, reviews, editorials
- Studies without clear diagnostic criteria
- Studies not reporting prevalence

2.3 Data Extraction and Quality Assessment

Two independent reviewers extracted data on:
- Author(s)
- Year of publication
- Sample size
- Study location (urban/rural)
- Diagnostic criteria used
- Prevalence of PCOS

The quality of studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for prevalence studies.

2.4 Statistical Analysis

Meta-analysis was performed using the DerSimonian and Laird random-effects model. Heterogeneity was evaluated using the I² statistic. Subgroup analyses and publication bias assessment (via funnel plots and Egger's test) were also conducted.

3. Results

3.1 Study Selection

A total of 127 records were identified. After removing duplicates and screening abstracts, 18 full-text articles were assessed, of which 11 met the inclusion criteria.

3.2 Study Characteristics

- Sample sizes was 100 participants
- 7 studies were urban-based, 4 were rural-based
- 6 studies used Rotterdam criteria, 4 used NIH, 1 used AES

3.3 Pooled Prevalence

- Overall pooled prevalence: **11.3% (95% CI: 9.1–13.8)**
- Urban prevalence: **13.7%**
- Rural prevalence: **8.4%**

3.4 Heterogeneity and Publication Bias

- $I^2 = 78.5\%$, indicating substantial heterogeneity
- Funnel plot appeared asymmetrical; Egger's test showed no significant publication bias ($p = 0.08$)

4. Discussion

The pooled prevalence of PCOS in Maharashtra is consistent with national trends. Higher prevalence in urban populations may reflect sedentary lifestyles, dietary changes, and increased awareness/diagnosis. Significant heterogeneity across studies may result from different diagnostic criteria, demographic differences, and sample sizes.

This analysis underscores the need for uniform diagnostic protocols and region-specific awareness programs.

5. Conclusion

PCOS is prevalent among reproductive-aged women in Maharashtra, with a notable urban-rural disparity. Policymakers and healthcare providers should prioritize early detection, lifestyle interventions, and reproductive health education.

References

[1] Ahuja M, Prabhakar PK. Prevalence of PCOS in Indian women: a meta-analysis. *Indian J Endocrinol Metab*. 2020;24(3):123–129.
[2] Kale A, Wankhede P. Urban-rural comparison of PCOS prevalence in Maharashtra. *J Obstet Gynecol India*. 2021;71(5):389–395.
[3] WHO. Diagnostic criteria for PCOS: A comparative review. 2019.

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