



## REVIEW ARTICLE

### EPIDEMIOLOGICAL ANALYSIS OF FEMALE INFERTILITY: CLINICAL PATTERNS, RISK FACTORS, AND HORMONAL IMBALANCES

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#### ABSTRACT

Infertility is a significant global health concern, affecting nearly 8-12% of couples worldwide. In India, infertility is a growing issue, with an increasing number of couples seeking medical intervention. This study analyzes the epidemiological trends, clinical patterns, and risk factors associated with female infertility among women attending a tertiary care center in Himachal Pradesh, India. A hospital-based observational study was conducted on 100 infertile women in the reproductive age group between May 2023 and August 2023. The study found that 71% of cases were primary infertility, while 29% were secondary infertility. Among these cases, 54% were attributed to female factors, while 21% were linked to male factors. The most common female factor was polycystic ovarian disease (PCOD), affecting 44% of women, followed by tubal blockage (13%) and hormonal imbalances such as thyroid dysfunction and elevated follicle-stimulating hormone (FSH). The study highlights the need for comprehensive infertility evaluations and early intervention strategies to optimize treatment outcomes.

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## INTRODUCTION

Infertility, characterized by the inability to achieve pregnancy after a year of regular unprotected intercourse, is a growing concern worldwide, with significant physical, emotional, and social implications. The World Health Organization (WHO) recognizes infertility as a global health issue, affecting millions of individuals and couples. In developing countries like India, the impact of infertility is further exacerbated by societal expectations and limited access to reproductive health services. Recent demographic changes, such as delayed marriages, changing lifestyle patterns, rising prevalence of obesity, and increased stress levels, have all contributed to a noticeable increase in infertility rates. Moreover, environmental pollutants, poor nutrition, and lack of physical activity may also impair reproductive function. Female infertility, which accounts for nearly half of all infertility cases, is commonly associated with conditions like polycystic ovarian syndrome (PCOS), tubal occlusion, endometriosis, and hormonal imbalances. Despite advances in diagnostic and therapeutic techniques, many women remain undiagnosed or misdiagnosed due to lack of awareness, cultural taboos, and inadequate healthcare infrastructure. This study was conducted at a tertiary care center in Himachal Pradesh with the aim of systematically evaluating the clinical patterns and underlying

causes of female infertility. By identifying common risk factors and clinical trends, the study seeks to guide early interventions and improve fertility outcomes in affected women. Infertility is defined by the World Health Organization (WHO) as the inability to conceive after 12 months of regular unprotected sexual intercourse. It is a major public health issue with significant medical, psychological, and social consequences. In India, infertility rates are rising due to lifestyle factors, environmental pollution, increasing age at marriage, and various medical conditions. Primary infertility is more common than secondary infertility. Studies suggest that nearly 40-50% of infertility cases are due to female factors, with conditions such as PCOD, tubal blockage, endometriosis, and hormonal imbalances playing crucial roles.

## MATERIALS AND METHODS

- **Study Design:** Hospital-based observational study
- **Duration:** May 2023 - August 2023
- **Sample Size:** 100 women
- **Inclusion Criteria:** Women diagnosed with infertility after a complete clinical and laboratory evaluation
- **Exclusion Criteria:** Cases without complete diagnostic workup
- **Data Collection:** Demographic details

- Menstrual history
- Medical history
- Hormonal assays (TSH, prolactin, FSH)
- Ultrasound findings
- Hysterosalpingography for tubal assessment

## RESULTS

**Demographics:** Mean age of women was 28.15 years (95% CI: 27.7-28.7).

**Residence:** 64% of women belonged to rural areas. Types of Infertility: Primary infertility was more prevalent (71%) than secondary infertility (29%).

**Menstrual Patterns:** 48% had irregular or infrequent cycles. Ultrasound Findings: 44% had PCOD, while 41% had normal imaging.

**Tubal Blockage:** 8% had both tubes blocked, while 5% had unilateral blockage.

**Table 1. Prevalence of Hormonal Disorders in Infertile Women**

Parameter	Normal (%)	Abnormal (%)
TSH (>4.5 IU/L)	84	16
Prolactin (>25 ng/mL)	95	5
FSH (>10 IU/L)	88	12

## DISCUSSION

The findings of this study provide valuable insights into the epidemiological and clinical landscape of female infertility in a tertiary care setting. A predominant number of cases were attributed to primary infertility, emphasizing the necessity for early screening and intervention strategies. Polycystic ovarian disease (PCOD) emerged as the most frequent cause, which is consistent with global and national data. This highlights the growing burden of lifestyle-related reproductive disorders, potentially exacerbated by sedentary habits, poor dietary patterns, and stress, especially in urbanizing rural regions. Hormonal imbalances such as thyroid dysfunction and hyperprolactinemia, although less frequent, were significant contributors to infertility. These findings underline the critical importance of including a thorough endocrine evaluation as a part of the standard infertility workup. Moreover, a noteworthy proportion of patients presented with tubal pathologies, indicating possible past pelvic infections or undiagnosed sexually transmitted diseases, which are preventable causes of infertility. The rural predominance of the studied population also reflects disparities in healthcare access and awareness. Women from such backgrounds may delay seeking medical assistance, leading to advanced disease stages by the time they present for evaluation.

Public health initiatives focused on reproductive education, early diagnosis, and destigmatizing infertility are essential for better outcomes. Overall, this study corroborates the multifactorial etiology of infertility and advocates for a comprehensive, multidisciplinary approach. It also stresses the need for health policy reforms aimed at improving infertility services in resource-constrained settings. This study confirms that female factor infertility is a leading cause, with PCOD and tubal blockage being the most common contributors. Similar studies have reported that PCOD affects nearly 40-50% of women seeking infertility treatment. Hormonal imbalances, such as hypothyroidism and elevated prolactin levels, further contribute to infertility, reinforcing the need for routine endocrine assessments.

## CONCLUSION

This study underscores the complexity and multifactorial nature of female infertility in a tertiary care setting. The predominance of primary infertility, particularly due to polycystic ovarian disease (PCOD) and tubal pathologies, highlights the pressing need for comprehensive reproductive health services that prioritize early screening, accurate diagnosis, and multidisciplinary management strategies. Hormonal disturbances, although observed in fewer cases, play a significant role and should be routinely assessed in all infertility evaluations. The high proportion of affected women from rural areas further emphasizes disparities in healthcare access and awareness. Addressing these gaps through targeted community outreach programs, reproductive health education, and enhanced training of frontline healthcare providers can significantly improve infertility outcomes in underserved populations.

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