



PREVALENCE, CLINICAL PATTERN AND MAJOR CAUSES OF MALE INFERTILITY IN INFERTILE COUPLES ATTENDING REGIONAL INSTITUTE OF MEDICAL SCIENCES (RIMS), UROLOGY OPD

Urology

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ABSTRACT

Background: Infertility, defined as the inability to conceive after 12 months of unprotected intercourse, affects 15–20% of couples globally, with male factors contributing to 40–50% of cases. Despite its prevalence, male infertility remains under diagnosed, particularly in regions with limited healthcare access. **Objective:** This study aimed to determine the prevalence, clinical patterns, and etiological factors of male infertility among couples attending a tertiary care centre in Arunachal Pradesh, India. **Methods:** A hospital-based cross-sectional study was conducted from November 2019 to December 2022, involving 223 infertile couples. Male partners underwent detailed history-taking, physical examination, semen analysis (per WHO 1999 criteria), endocrine profiling (testosterone, FSH, LH), scrotal ultrasound, and testicular biopsy (for azoospermic cases). Female partners were evaluated concurrently. **Results:** The prevalence of infertility was 5.9%. Primary infertility accounted for 66.8% of cases. Semen abnormalities were detected in 52.9% of males, with motility dysfunction (33.3%) being the most common. Male factor alone contributed to 40% of infertility cases, while 48% were attributed to female factors. Idiopathic causes (48.3%) and varicocele (29.7%) dominated male infertility aetiologies. Obstructive azoospermia (11.9%) and testicular failure (2.5%) were less frequent. **Conclusion:** Male infertility is a significant yet often overlooked contributor to couple infertility. Idiopathic causes and varicocele were predominant, highlighting the need for standardised diagnostic protocols and public awareness to address gender disparities in infertility evaluation.

KEYWORDS

Male infertility, prevalence, semen analysis, varicocele, idiopathic infertility, tertiary care.

INTRODUCTION

Infertility, defined as the failure to conceive after 12 months of regular unprotected intercourse (or 24 months per World Health Organization [WHO] recommendations), affects 15–20% of couples globally, with male factors contributing to 50% of cases (WHO). Despite its prevalence, male infertility remains underdiagnosed, as societal biases often attribute infertility solely to female factors. Approximately 30–45% of male infertility cases are idiopathic, presenting as oligoasthenoteratozoospermia (OAT) syndrome, while identifiable causes include varicocele (15–30%), obstructive pathologies, endocrine disorders, and genetic abnormalities.¹

Infertility remains both prevalent and problematic among couples worldwide. An estimated 4–17% of couples seek medical treatment in order to rectify their infertility and it is reasonable to assume that there are many more cases of infertility that are unreported.²

The prevalence of infertility is debated. A recent study by Johansson M, Hellstrom AL, Marie B reported that 9% of fertile-age couples suffer either primary or secondary infertility.³ Geographically diverse population-based studies have reported a remarkably consistent 15% to 20% incidence of infertility.¹

Current guidelines by American Society for Reproductive Medicine (ASRM/American Urological Association [AUA]) emphasize early male evaluation, particularly with risk factors like cryptorchidism or advanced female age.⁴ Diagnostic protocols include semen analysis (WHO standards), hormonal profiling, and imaging, yet standardized pathways for male infertility workups remain inconsistent. In regions with limited healthcare access, disparities in diagnosis and treatment persist.¹

This study evaluates the prevalence, etiological patterns, and clinical management of male infertility at a tertiary care centre in North East part of India, aiming to highlight the male factor's role in couple infertility and advocate for systematic, interdisciplinary diagnostic approaches to improve outcomes.

Aims And Objects

1. To determine the prevalence and clinical pattern of infertility in infertile couples attending RIMS, Urology OPD.
2. To determine the major causes of male infertility.

MATERIALS AND METHODS

Study Design

A Cross-sectional study conducted in the Department of Urology at RIMS, Imphal, Manipur, from November 2019 to December 2022.

Ethical Considerations

Approval taken from Institutional Ethics Committee.

Study Population

The study included 223 couples presenting with infertility. Sample size was calculated as 196 using the standard formula for cross-sectional studies ($Z=1.96$, $p=15\%$, margin of error=5%).

Data Collection And Evaluation

Both Partners Underwent Comprehensive Assessment:

1. Clinical Evaluation:

- Detailed medical history (reproductive, surgical, lifestyle factors)
- Physical examination focusing on endocrine signs and genital abnormalities

2. Male Partner Workup:

- Semen analysis (WHO 1999 criteria) with repeat testing if abnormal
- Hormonal profiling (testosterone, Follicular stimulating hormone (FSH), LH (Leutinizing Hormone) for oligozoospermic men (<20 million/mL)
- Scrotal ultrasound for all participants
- Testicular biopsy for azoospermic men with normal-sized testes and FSH

3. Female Partner Evaluation:

- Gynecological complete assessment advice

Study Variables

Primary Outcomes:

- Prevalence of infertility
- Pattern (primary/secondary)
- Etiological factors of male infertility

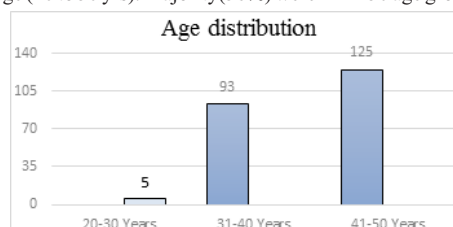
Statistical Analysis

Descriptive statistics were used to analyze demographic data, prevalence rates, and etiological patterns.

RESULTS AND OBSERVATIONS

In our study, 223 Infertile couples were included. Mean age 40.87±5.4

SD, range (20 to 50 yrs). Majority (56%) were in 41-50 age group.



District wise distribution shows majority of infertile couples were from urban areas. Out of total studied population, semen parameter was normal in 105 patients (47.1%) and 118 (52.9%) patients had some abnormalities in their semen parameter. Sperm motility dysfunction being the most common abnormality seen amongst all the abnormal semen parameters, found in 40 patients (33.3%) and followed by asthenospermia, oligospermia and Azospermia as shown below. (Table 1)

We found primary Infertility in 149 couples (66.8%) and Secondary Infertility in 74 patients (33.2%). In our study it was found that female factor accounts for 48% of infertility while male factor was found in 89 patients (40%) and both male and female factor was found in 29 patients.

Idiopathic infertility was the most common etiology of male Infertility in our study, followed by varicocele, obstruction and other causes as highlighted in the table.

The estimated prevalence of infertility in patients attending Urology OPD according to our study is 5.9%. Table 1.

Parameters		Frequency	Percent age(%)
Age	20-30	5	
	31-40	93	
	41-50	125	
District wise distribution			
	Imphal West	57	
	Imphal East	45	
	Bishnupur	32	
	Churachandpur	15	
	Chandel	10	
	Senapati	19	
	Thoubal	34	
	Tamenglong	5	
	Ukhrul	6	
Semen Parameters	Normal	105	
	Abnormal	118	
	Motility	40	33.3
	Asthenospermia	32	27.1
	Oligospermia	25	21.2
	Azoospermia	17	14.4
	Volume	4	3.4
Infertility pattern	Primary Infertility	149	66.8%
	Secondary Infertility	74	33.2%
Factors of Infertility	Male factor alone	89	40%
	Female factors alone	105	48%
	Both factors	29	12%
Etiology of Infertility		No. Of cases	%
	Idiopathic	57	48.3
	Varicocele	35	29.7
	Obstruction	14	11.9
	Immunologic	2	1.7
	Cryptorchidism	1	0.84
	Endocrinology	1	0.84
	Genetic	2	1.69
	Testicular failure	3	2.54
	Torsion	1	0.84
	Drug	2	1.69

DISCUSSION

Infertility remains a significant global health concern, affecting a

substantial proportion of couples in their reproductive years. Our study aligns with existing literature, reinforcing the widespread prevalence of infertility while providing region-specific insights from Manipur, India. The findings highlight key demographic, etiological, and diagnostic patterns that contribute to the understanding of male infertility in this population.

Prevalence And Demographic Variations

Our study recorded a 5.9% prevalence of infertility among couples attending the urology clinic, which is lower than reports from other Indian regions (8.97%–14.6%) (5,6) and global estimates (15%–20%) (1). This discrepancy may stem from underreporting, cultural stigma, or differences in healthcare-seeking behaviour. Notably, most patients were from Manipur's valley districts (Imphal East, Imphal West, Thoubal, and Bishnupur), likely due to better healthcare access, higher socioeconomic status, and greater awareness compared to hill districts. This geographic disparity underscores the role of socioeconomic and infrastructural factors in infertility diagnosis and management.

Male Factor Infertility And Semen Abnormalities

Consistent with global trends⁷, male factor infertility contributed to 40% of cases, with an additional 12% involving combined male and female factors. Semen analysis revealed abnormalities in 52.9% of male partners, with sperm motility dysfunction (33.3%) being the most common, followed by asthenospermia, oligospermia, and azoospermia. These findings mirror studies reporting idiopathic male infertility (48.3%) as the leading cause, followed by varicocele (29.7%) and obstructive pathologies (11.9%)^{7,8}. The high rate of idiopathic cases emphasizes the need for advanced diagnostic tools to uncover subtle genetic or molecular abnormalities.

Primary Vs. Secondary Infertility

Our data showed 66.8% primary infertility and 33.2% secondary infertility, aligning with studies from Iraq by Razzak and Wall⁽⁹⁾ and India⁽¹⁰⁾ but contrasting with Hassan Sayed K.E study to know the prevalence of Infertility in Egyptian population⁽¹¹⁾ and Iranian study by Mohammad M et al.⁽¹²⁾ reports where secondary infertility predominated. This variation may reflect differences in underlying etiologies, such as infections, lifestyle factors, or post-reproductive complications.

Endocrine And Histopathological Findings

Endocrine evaluation in 64 patients identified secondary testicular failure (3 cases) and primary testicular failure (1 case), suggesting that hormonal imbalances, though not the leading cause, remain relevant in infertility workups. Testicular biopsy in azoospermic men confirmed obstructive causes (14 cases) over non-obstructive (3 cases), reinforcing the need for surgical sperm retrieval techniques in obstructive azoospermia.

Comparative Insights And Unexplained Infertility

Our findings corroborate global studies where female factors (48%) slightly outweighed male factors (40%), similar to Nigerian study by Nwajiaku L.A et al.⁽¹³⁾ but differing from Iranian⁽¹²⁾ reports attributing 50% of infertility to male causes. Notably, 12% of cases had combined male-female factors, highlighting the necessity for simultaneous evaluation of both partners. The 10–15% rate of unexplained infertility⁽⁴⁾ in our cohort aligns with ASRM data, suggesting limitations in routine diagnostic methods and the potential role of genetic/epigenetic factors.

Limitations

- Single-center design may limit generalizability.
- Underrepresentation of hill districts due to healthcare access disparities.
- Lack of advanced genetic testing for idiopathic cases.

Summary

This study highlights the significant role of male infertility in couples struggling with conception, identifying idiopathic causes (48.3%) and varicocele (29.7%) as the most common factors. Key findings reveal that sperm motility dysfunction (33.3%) is the leading semen abnormality, followed by oligospermia and azoospermia. Geographic disparities, particularly between Manipur's valley and hill districts, suggest that socioeconomic status, healthcare access, and awareness influence infertility diagnosis rates.

Endocrine evaluations revealed secondary testicular failure in some

cases, while testicular biopsies confirmed obstructive azoospermia as a treatable cause. Despite thorough assessments, 12% of cases remained unexplained, underscoring the limitations of conventional diagnostics. The study emphasizes the need for advanced genomic and proteomic research to uncover hidden causes of idiopathic infertility, paving the way for precision-based treatments. These insights call for integrated couple-centered evaluations and targeted interventions to improve fertility outcomes in diverse populations.

CONCLUSION

This study reinforces that male infertility is a major contributor to couple infertility, with idiopathic causes and varicocele being predominant. Geographic and socioeconomic factors influence diagnosis rates, while endocrine and obstructive pathologies require targeted interventions. Future research should integrate genomic and proteomic analyses to elucidate idiopathic cases, improving diagnostic precision and treatment outcomes.

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