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Prevalence of Pelvic Pathology in Patients of Female Infertility Using Diagnostic Laparohysteroscopy in a Tertiary Care Hospital of North India

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KEYWORDS

Female infertility; Diagnostic hysterolaparoscopy; Laparoscopy; Hysteroscopy; Pelvic pathology; Uterine cavity abnormalities; Endometriosis; Tubal factors

ABSTRACT:

Background: Female infertility is a multifactorial condition, and accurate detection of pelvic and intrauterine pathology is essential for effective management. Diagnostic hysterolaparoscopy provides direct visualization of reproductive organs and may identify abnormalities missed by conventional imaging.

Objectives: To determine the prevalence and pattern of pelvic and intrauterine pathologies in women with infertility using diagnostic hysterolaparoscopy and to compare its diagnostic yield with ultrasonography.

Materials and Methods: This hospital-based cross-sectional study was conducted in the Department of Obstetrics and Gynecology at a tertiary care hospital in North India over 18 months. Sixty-four women with primary or secondary infertility underwent diagnostic hysterolaparoscopy. Clinical data, ultrasonographic findings, and endoscopic findings were recorded and analyzed using SPSS. Results were expressed as frequencies, percentages, and mean ± SD, with $p < 0.05$ considered statistically significant.

Results: The mean age of patients was 30.1 ± 7.5 years, with primary infertility seen in 75% of cases. Diagnostic hysterolaparoscopy detected abnormalities in 73.4% of patients, compared to 65.6% detected by ultrasonography. Common laparoscopic findings included pelvic endometriosis (17.2%) and pelvic adhesions (17.2%), while hysteroscopy most frequently revealed abnormal endometrium (29.7%) and uterine polyps (18.8%). Many pathologies were identified despite normal ultrasonographic findings.

Conclusion: Diagnostic hysterolaparoscopy has a high diagnostic yield in the evaluation of female infertility and is superior to ultrasonography in detecting pelvic and intrauterine pathologies. Its early use allows comprehensive assessment and facilitates timely therapeutic intervention.

INTRODUCTION

Infertility is a global reproductive health concern with significant medical, psychological, and social implications. The World Health Organization (WHO) defines infertility as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse [1]. It affects approximately 10–15% of couples worldwide, with a substantial burden in developing countries, including India, where infertility often carries profound social stigma and emotional distress [2].

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Female factors contribute to nearly 40–50% of infertility cases, either independently or in combination with male factors [3]. Common female causes include tubal pathology, ovulatory dysfunction, endometriosis, uterine anomalies, pelvic adhesions, and intrauterine lesions such as polyps and fibroids [4]. Many of these conditions are subtle or occult and may not be accurately detected by routine clinical examination or non-invasive imaging modalities alone.

Ultrasonography is frequently used as the first-line investigation in the evaluation of female infertility; however, it has limitations in detecting peritoneal endometriosis, pelvic adhesions, early tubal disease, and certain intrauterine abnormalities [5]. Hysterosalpingography (HSG), although useful for assessing tubal patency, may yield false-positive or false-negative results and does not provide information about peritoneal or ovarian pathology [6].

Diagnostic hysterolaparoscopy has emerged as the gold standard for comprehensive evaluation of female infertility, as it allows direct visualization of the uterine cavity, fallopian tubes, ovaries, and peritoneal surfaces in a single procedure [7]. Hysteroscopy enables accurate assessment of intrauterine pathologies such as endometrial polyps, submucous fibroids, uterine septa, and intrauterine adhesions, while laparoscopy facilitates evaluation of tubal patency, pelvic adhesions, endometriosis, and adnexal pathology [8]. Additionally, minor corrective procedures can be performed simultaneously, thereby reducing the need for multiple interventions [9].

Several studies have reported a high prevalence of pelvic and intrauterine abnormalities detected by diagnostic hysterolaparoscopy even in patients with normal clinical examination and ultrasonography findings [10,11]. The prevalence and pattern of these pathologies vary according to age, duration, and type of infertility, as well as geographic and socioeconomic factors [12]. Data from North India, particularly from tertiary care teaching hospitals, remain limited despite the growing burden of infertility.

Therefore, the present study was undertaken to determine the prevalence and spectrum of pelvic and intrauterine pathologies in women presenting with primary and secondary infertility using diagnostic hysterolaparoscopy in a tertiary care hospital of North India. The study also aimed to correlate these findings with age, duration, and type of infertility and to compare the diagnostic yield of hysterolaparoscopy with ultrasonography.

MATERIALS AND METHODS

Study Design and Setting

This hospital-based cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Integral Institute of Medical Sciences and Research (IIMSR), Lucknow.

Study Period

The study was carried out over a period of 18 months, from January 2024 to June 2025, after obtaining approval from the Institutional Ethics Committee of IIMSR.

Study Population

The study population comprised women attending the outpatient department of Obstetrics and Gynecology at IIMSR, Lucknow, with complaints of primary or secondary infertility.

Sample Size

The sample size was calculated using the formula:

$$n=\frac{z^2\times p(1-p)}{d^2}$$

Where:

- n = sample size
- p = expected prevalence (60% or 0.6)
- z = Z-score at 95% confidence level (1.96)
- d = allowable error (20% or 0.2)

Based on the above calculation, a total sample size of **64 patients** was obtained.

Inclusion Criteria

1. Women diagnosed with primary or secondary infertility.
2. Patients who provided written informed consent for diagnostic hysterolaparoscopy and participation in the study.

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Exclusion Criteria

1. Patients with proven male factor infertility.
2. Patients unwilling to provide consent for hysterolaparoscopy.

Data Collection

Eligible participants were counseled regarding the objectives, procedures, benefits, and potential risks of the study in their preferred language (local language or English). Written informed consent was obtained prior to enrollment.

A detailed clinical history was recorded, including duration and type of infertility, menstrual history, obstetric history, past medical and surgical history, and relevant personal and family history. Relevant treatment history of both partners was documented.

Clinical Examination and Investigations

All participants underwent:

- **Clinical examination:** General physical, systemic, and gynecological examination.
- **Investigations:** Routine blood investigations (complete blood count, coagulation profile), pelvic ultrasonography (transvaginal or transabdominal as indicated), and semen analysis of the male partner to exclude male factor infertility.

Patients were advised to report during the next menstrual cycle. Those planned for hysterolaparoscopy were admitted during the pre-ovulatory phase (day 6–10 of the menstrual cycle) to ensure optimal visualization and minimize procedural risks.

Methodology: Diagnostic Hysterolaparoscopy

Diagnostic hysterolaparoscopy was performed to evaluate pelvic and intrauterine pathologies contributing to female infertility. The procedure included hysteroscopy for assessment of the uterine cavity and laparoscopy for evaluation of pelvic structures.

The pathologies assessed were categorized as:

- **Tubal pathologies:** Tubal occlusion, hydrosalpinx, peritubal adhesions, and tubal scarring.
- **Adnexal pathologies:** Ovarian cysts (functional cysts, endometriomas), polycystic ovaries, and adnexal adhesions.
- **Peritoneal pathologies:** Endometriosis, pelvic adhesions, and inflammatory changes.
- **Intrauterine pathologies:** Endometrial polyps, uterine septum, submucous fibroids, and intrauterine adhesions.

Hysterolaparoscopy Procedure

Pre-procedure

All patients were evaluated preoperatively by an anesthesiologist to assess fitness for general anesthesia. Standard preoperative protocols, including 6–8 hours of fasting and baseline investigations, were followed. Patients were counseled regarding the procedure and possible complications such as bleeding and infection.

Operative Procedure

All procedures were performed by experienced gynecologists under general anesthesia using standardized equipment.

- **Hysteroscopy:**
  A hysteroscope was introduced trans-cervically, and the uterine cavity was distended using sterile saline or glycine. The endometrial cavity, uterine walls, and tubal ostia were examined for abnormalities such as polyps, septa, fibroids, and adhesions. Findings were classified using standard criteria, including the American Society for Reproductive Medicine (ASRM) classification. Minor therapeutic procedures, such as polypectomy, were performed when indicated.
- **Laparoscopy:**
  Pneumoperitoneum was created using carbon dioxide at a pressure of 12–15 mmHg through a 5–10 mm umbilical port. Additional 5-mm accessory ports were placed as required. The uterus, fallopian tubes, ovaries, and peritoneal surfaces were systematically inspected. Tubal patency was assessed using chromopertubation with methylene blue dye. Pathologies such as endometriosis and adhesions were graded using the revised ASRM classification. Minor

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operative procedures, including adhesiolysis, were performed when necessary.

Post-procedure

Patients were monitored in the recovery room for 2–4 hours for any immediate complications. Most patients were discharged within 24 hours with appropriate medications and follow-up instructions. Any adverse events were documented and managed according to institutional protocols.

Data Recording and Management

Data collected included clinical details, examination findings, investigation results, hysterolaparoscopy findings, and details of any therapeutic interventions performed. All findings were recorded using a standardized proforma. Quality control measures included cross-verification of data by a second investigator and periodic audits to ensure completeness and accuracy. Patient confidentiality was maintained through coded identifiers. Data were entered into Microsoft Excel and analyzed using SPSS (trial version).

Statistical Analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) trial version. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as mean ± standard deviation (SD). Associations between variables were assessed using appropriate statistical tests, including the chi-square test for categorical data. A p value of <0.05 was considered statistically significant.

Ethical Considerations

The study was conducted in accordance with ethical principles approved by the Institutional Ethics Committee of IIMSR. Written informed consent was obtained from all participants. Participants were assured of confidentiality and their right to withdraw from the study at any time without affecting their medical care.

RESULTS AND OBSERVATIONS;

The largest proportion, 28 patients (43.8%), were within the 26–30-year age group, followed by 18 patients (28.1%) aged 25 years or younger. Twelve patients (18.8%) were aged 31–35 years, while the smallest group, comprising 6 patients (9.4%), was older than 35 years. The mean age of the patients was 30.1±7.5 years.

Table 1: Distribution of the studied patients based on age (n = 64)

Age Group (years)	Number of Patients	Percentage (%)
≤ 25	18	28.1
26–30	28	43.8
31–35	12	18.8
> 35	6	9.4
Total	**64**	**100.0**
Mean ± SD	**30.1 ± 7.5**	

Table:2 Demographic, Anthropometric, and Clinical Characteristics of the Studied Patients (n = 64)

Variable	Category / Parameter	Number (%) / Mean ± SD	Range / p-value
Age distribution (years)	≤ 25	18 (28.1%)	—
	26–30	28 (43.8%)	—

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	31–35	12 (18.8%)	—
	> 35	6 (9.4%)	—
	Mean age (years)	**30.1 ± 7.5**	—
Anthropometry (overall)	Height (cm)	164.0 ± 6.0	149–173
	Weight (kg)	66.5 ± 10.2	41–86
	BMI (kg/m²)	28.4 ± 4.2	16.0–33.6
Anthropometry by infertility type	Age (years) – Primary (n=48)	28.06 ± 4.6	p = 0.375
	Age (years) – Secondary (n=16)	29.38 ± 6.3	—
	Weight (kg) – Primary	66.54 ± 10.5	p = 0.077
	Weight (kg) – Secondary	66.31 ± 9.8	—
	BMI (kg/m²) – Primary	24.98 ± 4.3	p = 0.579
	BMI (kg/m²) – Secondary	24.25 ± 3.7	—
Residence	Rural	29 (45.3%)	—
	Urban	35 (54.7%)	—

Table: 3 Distribution of the Studied Patients Based on Duration and Type of Infertility (n = 64)

Variable	Category	Number of Patients	Percentage (%)
Duration of infertility	< 2 years	4	6.3
	2–5 years	46	71.9
	> 5 years	14	21.9
	Mean ± SD (years)	**3.98 ± 1.7**	—
Type of infertility	Primary infertility	48	75.0
	Secondary infertility	16	25.0
	Total	**64**	**100.0**

Table 4: Baseline Hormonal and Biochemical Profile of the Studied Patients (n = 64)

Investigation	Mean ± SD	Range
Fasting Blood Sugar (mg/dL)	84.2 ± 10.4	70 – 115
Postprandial Blood Sugar (mg/dL)	98.2 ± 14.6	74 – 135
T3 (ng/mL)	1.25 ± 0.31	0.80 – 1.80
T4 (ng/dL)	8.55 ± 2.0	5.80 – 13.50
TSH (µIU/L)	2.30 ± 0.75	0.88 – 4.25

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FSH (IU/mL)	5.8 ± 1.7	3.40 – 9.24
LH (IU/mL)	4.7 ± 2.0	1.10 – 8.16
Prolactin (ng/mL)	17.8 ± 5.3	3.56 – 28.19

Table:5 Semen Analysis of Husbands and Prevalence of Imaging and Endoscopic Findings in the Studied Patients (n = 64)

Parameter	Category	Primary Infertility (n = 48)	Secondary Infertility (n = 16)	Total / Percentage
Husband semen analysis	Sperm concentration >15 million/mL	—	—	64 (100.0%)
	Total sperm count >39 million	—	—	64 (100.0%)
	Sperm morphology >4%	—	—	64 (100.0%)
	Total motility >40%	—	—	64 (100.0%)
	Progressive motility >32%	—	—	64 (100.0%)
Ultrasonography (USG)	Normal	18 (37.5%)	4 (25.0%)	—
	Abnormal	30 (62.5%)	12 (75.0%)	—
Laparoscopy	Normal	14 (29.2%)	3 (18.8%)	—
	Abnormal	34 (70.8%)	13 (81.2%)	—
Hysteroscopy	Normal	11 (22.9%)	6 (37.5%)	—
	Abnormal	37 (77.1%)	10 (62.5%)	—

Table 6: Distribution of Patients Based on Ultrasonographic (USG) Findings (n = 64)

USG Finding	Primary Infertility (n = 48)	Secondary Infertility (n = 16)	Total (n = 64)
Normal	18 (37.5%)	4 (25.0%)	22 (34.4%)
Fibroid	4 (8.3%)	1 (6.2%)	5 (7.8%)
Endometrial polyp	2 (4.2%)	0 (0.0%)	2 (3.1%)
Tubo-ovarian mass	2 (4.2%)	1 (6.2%)	3 (4.7%)
Complex ovarian cyst	4 (8.3%)	1 (6.2%)	5 (7.8%)
Increased endometrial thickness	10 (20.8%)	5 (31.2%)	15 (23.4%)
Free fluid in pouch of Douglas	6 (12.5%)	4 (25.0%)	10 (15.6%)
Hydrosalpinx	2 (4.2%)	0 (0.0%)	2 (3.1%)

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Table:7 Distribution of Laparoscopic and Hysteroscopic Findings among Infertility Patients (n = 64)

Investigation	Finding	Primary Infertility (n = 48)	Secondary Infertility (n = 16)	Total (n = 64)
Laparoscopy with chromopertubation	Normal	14 (29.2%)	3 (18.8%)	17 (26.6%)
	Pelvic adhesions	7 (14.6%)	4 (25.0%)	11 (17.2%)
	Tubo-ovarian mass	5 (10.4%)	1 (6.2%)	6 (9.4%)
	Hydrosalpinx	2 (4.2%)	0 (0.0%)	2 (3.1%)
	Tubal blockage	2 (4.2%)	1 (6.2%)	3 (4.7%)
	Ovarian cyst	3 (6.2%)	1 (6.2%)	4 (6.2%)
	Pelvic endometriosis	9 (18.8%)	2 (12.5%)	11 (17.2%)
	Fluid in pouch of Douglas	3 (6.2%)	2 (12.5%)	5 (7.8%)
	Subserosal fibroid	3 (6.2%)	2 (12.5%)	5 (7.8%)
Hysteroscopy	Normal	11 (22.9%)	6 (37.5%)	17 (26.6%)
	Uterine polyps	11 (22.9%)	1 (6.2%)	12 (18.8%)
	Submucosal fibroid	5 (10.4%)	2 (12.5%)	7 (10.9%)
	Tubal blockage	4 (8.3%)	0 (0.0%)	4 (6.2%)
	Abnormal endometrium	14 (29.2%)	5 (31.2%)	19 (29.7%)
	Asherman syndrome	1 (2.1%)	2 (12.5%)	3 (4.7%)
	Septate uterus	1 (2.1%)	0 (0.0%)	1 (1.6%)
	Arcuate uterus	1 (2.1%)	0 (0.0%)	1 (1.6%)

Table:8 Stratification of Ultrasonography and Laparoscopy Findings with Respect to Age Group and Duration of Infertility (n = 64)

Investigation	Finding	≤25 yrs	26–30 yrs	31–35 yrs	>35 yrs	*p*-value (Age)	<2 yrs	2–5 yrs	>5 yrs	*p*-value (Duration)
Ultrasonography (USG)	Normal	5 (22.7%)	12 (54.5%)	2 (9.1%)	3 (13.6%)	0.680	1 (4.5%)	16 (72.7%)	5 (22.7%)	0.503
	Fibroid	1 (20.0	3 (60.0%)	1 (20.0	0 (0.0%)	—	0 (0.0%)	4 (80.0%)	1 (20.0	—

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		%)		%)					%)	
	Polyp	0 (0.0%)	2 (100.0 %)	0 (0.0%)	0 (0.0%)	—	0 (0.0%)	1 (50.0%)	1 (50.0 %)	—
	Tubo-ovarian mass	2 (66.7 %)	1 (33.3%)	0 (0.0%)	0 (0.0%)	—	0 (0.0%)	3 (100.0 %)	0 (0.0%)	—
	Complex ovarian cyst	2 (40.0 %)	1 (20.0%)	1 (20.0 %)	1 (20.0 %)	—	1 (20.0 %)	3 (60.0%)	1 (20.0 %)	—
	Increased endometrial thickness	4 (26.7 %)	4 (26.7%)	6 (40.0 %)	1 (6.7%)	—	1 (6.7%)	11 (73.3%)	3 (20.0 %)	—
	Free fluid in POD	3 (30.0 %)	5 (50.0%)	1 (10.0 %)	1 (10.0 %)	—	0 (0.0%)	8 (80.0%)	2 (20.0 %)	—
	Hydrosalpinx	1 (50.0 %)	0 (0.0%)	1 (50.0 %)	0 (0.0%)	—	1 (50.0 %)	0 (0.0%)	1 (50.0 %)	—
Laparoscopy	Normal	5 (29.4 %)	10 (58.8%)	0 (0.0%)	2 (11.8 %)	0.412	1 (5.9%)	13 (76.5%)	3 (17.6 %)	0.495
	Pelvic adhesions	2 (18.2 %)	3 (27.3%)	5 (45.5 %)	1 (9.1%)	—	1 (9.1%)	9 (81.8%)	1 (9.1%)	—
	Tubo-ovarian mass	0 (0.0%)	4 (66.7%)	2 (33.3 %)	0 (0.0%)	—	1 (16.7 %)	3 (50.0%)	2 (33.3 %)	—
	Hydrosalpinx	0 (0.0%)	1 (50.0%)	0 (0.0%)	1 (50.0 %)	—	0 (0.0%)	2 (100.0 %)	0 (0.0%)	—
	Tubal blockage	2 (66.7 %)	1 (33.3%)	0 (0.0%)	0 (0.0%)	—	1 (33.3 %)	2 (66.7%)	0 (0.0%)	—
	Ovarian cyst	1 (25.0 %)	2 (50.0%)	1 (25.0 %)	0 (0.0%)	—	0 (0.0%)	3 (75.0%)	1 (25.0 %)	—
	Pelvic endometriosis	4 (36.4 %)	5 (45.5%)	2 (18.2 %)	0 (0.0%)	—	0 (0.0%)	6 (54.5%)	5 (45.5 %)	—

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	Fluid in POD	2 (40.0 %)	1 (20.0%)	1 (20.0 %)	1 (20.0 %)	—	0 (0.0%)	3 (60.0%)	2 (40.0 %)	—
	Subserosal fibroid	2 (40.0 %)	1 (20.0%)	1 (20.0 %)	1 (20.0 %)	—	0 (0.0%)	5 (100.0 %)	0 (0.0%)	—

Table 9: Stratification of Hysteroscopy Findings with Respect to Age Group, Duration of Infertility, and Comparison with Diagnostic Modalities

A. Stratification of Hysteroscopy Findings

Variable	Normal	Uterine Polyps	Submucosal Fibroid	Tubal Blockage	Abnormal Endometrium	Asherman Syndrome	Septate Uterus	Arcuate Uterus	p-value
Age group (years)									
≤25	4 (23.5%)	2 (16.7 %)	3 (42.9%)	2 (50.0%)	4 (21.1%)	3 (100%)	0 (0.0%)	0 (0.0%)	**0.092**
26–30	8 (47.1%)	6 (50.0 %)	3 (42.9%)	1 (25.0%)	8 (42.1%)	0 (0.0%)	1 (100%)	1 (100%)	
31–35	0 (0.0%)	3 (25.0 %)	1 (14.3%)	1 (25.0%)	7 (36.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
>35	5 (29.4%)	1 (8.3 %)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Duration of infertility									
<2 years	1 (5.9%)	1 (8.3 %)	1 (14.3%)	0 (0.0%)	1 (5.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	**0.739**
2–5 years	13 (76.5%)	10 (83.3 %)	5 (71.4%)	3 (75.0%)	11 (57.9%)	3 (100%)	0 (0.0%)	1 (100%)	
>5 years	3 (17.6%)	1 (8.3 %)	1 (14.3%)	1 (25.0%)	7 (36.8%)	0 (0.0%)	1 (100%)	0 (0.0%)	

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B. Prevalence of Normal and Abnormal Findings by Diagnostic Modality

Diagnostic Modality	Normal n (%)	Abnormal n (%)
Ultrasonography (USG)	22 (34.4%)	42 (65.6%)
Hysteroscopy	17 (26.6%)	47 (73.4%)
Laparoscopy	17 (26.6%)	47 (73.4%)

DISCUSSION

Infertility remains a significant reproductive health problem, and accurate identification of underlying female pelvic pathology is essential for appropriate management. In the present hospital-based cross-sectional study, diagnostic hysterolaparoscopy revealed a high prevalence of pelvic and intrauterine abnormalities among women presenting with primary and secondary infertility, underscoring its diagnostic superiority over conventional imaging modalities.

Age and Type of Infertility

In this study, the majority of patients belonged to the 26–30-year age group, with a mean age of 30.1 ± 7.5 years. Similar age distributions have been reported by Nayak et al. and Sharma et al., reflecting increased health-seeking behavior among women in this reproductive age group [1,2]. Primary infertility constituted 75% of cases, which aligns with observations from other Indian studies, where primary infertility ranges from 60% to 80% [3,4]. This predominance may reflect earlier evaluation of infertility before conception has ever occurred.

Duration of Infertility

Most patients (71.9%) had infertility of 2–5 years' duration, with a mean duration of 3.98 ± 1.7 years. Comparable findings have been documented by Aziz and Godinjak et al., suggesting that couples often seek tertiary care after prolonged unsuccessful treatment elsewhere [5,6]. Longer duration of infertility was associated with a higher prevalence of abnormal laparoscopic and hysteroscopic findings, although this association did not reach statistical significance in the present study.

Ultrasonography versus Endoscopic Evaluation

Ultrasonography detected abnormalities in 65.6% of patients; however, diagnostic hysterolaparoscopy revealed abnormalities in 73.4% of cases, highlighting its superior diagnostic yield. Conditions such as pelvic endometriosis, peritoneal adhesions, subtle tubal pathology, and intrauterine adhesions were frequently missed on ultrasonography. Similar discrepancies between imaging and endoscopic findings have been reported by Brown et al. and Swart et al. [7,8].

Laparoscopic Findings

Laparoscopy revealed abnormal findings in 73.4% of patients. Pelvic endometriosis (17.2%) and pelvic adhesions (17.2%) were the most common laparoscopic abnormalities, followed by tubo-ovarian masses and ovarian cysts. These findings are consistent with previous studies, where endometriosis prevalence ranges from 15% to 40% in infertile women [9,10]. Endometriosis was more common in primary infertility and in women with longer duration of infertility, supporting its progressive nature and adverse effect on fertility.

Tubal pathology, including hydrosalpinx and tubal blockage, was identified in 7.8% of patients, emphasizing the importance of chromopertubation during laparoscopy. Hysterosalpingography alone may not reliably differentiate between tubal spasm and true occlusion, making laparoscopy the gold standard for tubal evaluation [8,11].

Hysteroscopic Findings

Hysteroscopy demonstrated abnormal uterine cavity findings in 73.4% of patients. Abnormal endometrium (29.7%) and uterine polyps (18.8%) were the most frequently observed abnormalities, followed by submucosal fibroids. These findings are in agreement with studies by Bosteels et al. and Tsuji et al., which highlight the high prevalence of correctable intrauterine lesions in infertile women [12,13].

Intrauterine adhesions (Asherman syndrome) were more common in secondary infertility, likely due to previous obstetric or gynecological interventions. Congenital

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uterine anomalies such as septate and arcuate uterus were infrequent, consistent with their reported low prevalence in the general population [14].

Correlation with Age and Duration of Infertility

Although stratification of laparoscopic and hysteroscopic findings according to age and duration of infertility showed certain trends—such as increased adhesions and endometriosis with advancing age and longer infertility duration—these associations were not statistically significant. Similar observations have been reported by other authors, suggesting multifactorial influences rather than age alone [2,5].

Diagnostic Value of Hysterolaparoscopy

The present study confirms that diagnostic hysterolaparoscopy offers comprehensive evaluation of infertility by detecting pelvic and intrauterine pathology in a single sitting. Importantly, it allows simultaneous therapeutic intervention, potentially improving fertility outcomes while reducing time to treatment. The high prevalence of abnormalities detected despite normal ultrasonography highlights its value even in apparently unexplained infertility.

CONCLUSION

Diagnostic hysterolaparoscopy revealed a high prevalence of pelvic and intrauterine abnormalities in infertile women, many of which were missed on ultrasonography. It provided comprehensive evaluation of uterine, tubal, ovarian, and peritoneal factors in a single procedure. Early use of hysterolaparoscopy can aid accurate diagnosis, enable simultaneous therapeutic intervention, and improve the management of female infertility.

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