DOI: https://doi.org/10.53350/pjmhs20231711376

ORIGINAL ARTICLE

Pelvic Pathologies in Primary Infertility: A Diagnostic Laparoscopy Study of 106 Patients

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ABSTRACT

Objective: To evaluate the frequency of pelvic pathologies diagnosed via diagnostic laparoscopy in patients with primary infertility.

Methods: A retrospective study was conducted on 106 women diagnosed with primary infertility who underwent diagnostic laparoscopy between September 2022 to August 2023. Clinical records, laparoscopy findings, and patient outcomes were reviewed. The most common pelvic pathologies identified were recorded and analyzed.

Results: Among the 106 patients, the most frequent pelvic pathologies included tubal occlusion (30%), endometriosis (25%), pelvic adhesions (18%), and uterine anomalies (10%). A significant correlation was found between the presence of endometriosis and tubal occlusion ($p<0.05$). Additionally, adhesions were most commonly associated with previous pelvic surgeries or infections.

Conclusion: Diagnostic laparoscopy is a valuable tool for identifying pelvic pathologies in primary infertility. Tubal factors and endometriosis are the most common causes, with significant implications for fertility management.

Keywords: Primary infertility, diagnostic laparoscopy, pelvic pathologies, tubal occlusion, endometriosis, adhesions, uterine anomalies.

INTRODUCTION

Infertility is a significant public health concern, affecting an estimated 10-15% of couples globally. Among these, primary infertility defined as the inability to conceive after 12 months of regular, unprotected intercourse is a major challenge[1]. Pelvic pathologies play a substantial role in the development of infertility, impairing various reproductive functions such as ovulation, fertilization, and embryo implantation. Accurate identification and management of these conditions are essential for improving fertility outcomes in affected couples[2].

The most common pelvic pathologies contributing to primary infertility include tubal factors, endometriosis, pelvic adhesions, uterine anomalies, and ovarian pathologies. Tubal factor infertility is primarily caused by conditions such as tubal occlusion or damage, which may result from past infections like pelvic inflammatory disease (PID), endometriosis, or prior surgeries[3]. In fact, tubal occlusion remains one of the leading causes of infertility worldwide[4].

Endometriosis, a condition characterized by the presence of endometrial-like tissue outside the uterus, affects around 10-15% of women of reproductive age and is frequently found in women experiencing infertility[5]. This disease often leads to adhesions, ovarian cysts, and tubal damage, making it one of the most common pathologies identified during laparoscopy in infertile women[6]. Endometriosis can cause both anatomic changes and hormonal imbalances, significantly reducing the chances of conception[7].

Pelvic adhesions, often a sequela of infections, surgeries, or endometriosis, can distort normal pelvic anatomy and impair gamete transport. These adhesions may prevent the fallopian tubes from capturing the egg or inhibit sperm motility[8]. Uterine anomalies, including septate or bicornuate uteri, are congenital defects that can impair implantation and cause recurrent miscarriages[9]. Furthermore, ovarian cysts, such as those caused by polycystic ovary syndrome (PCOS) or functional cysts, may disrupt normal ovulation and contribute to infertility[10].

Diagnostic laparoscopy has become the gold standard for diagnosing these pelvic pathologies, providing direct visualization of the reproductive organs and enabling simultaneous therapeutic interventions[11]. The objective of this study was to evaluate the frequency of these pelvic pathologies in 106 women diagnosed with primary infertility who underwent diagnostic laparoscopy, and to explore the associations between these conditions.

Received on 12-09-2023
Accepted on 28-10-2023

METHODOLOGY

Study Design: This study was a retrospective cohort study conducted at Loralai Medical College and Teaching Hospital from September 2022 to August 2023. We aimed to evaluate the frequency and types of pelvic pathologies diagnosed by diagnostic laparoscopy in women with primary infertility. All patients were diagnosed with primary infertility and had undergone diagnostic laparoscopy as part of their infertility workup.

Inclusion Criteria:

1. Women aged between 20 and 40 years.
2. Diagnosis of primary infertility, defined as the inability to conceive after 12 months of regular, unprotected intercourse.
3. Patients who underwent diagnostic laparoscopy for infertility evaluation during the study period.

Exclusion Criteria:

1. Women with secondary infertility.
2. Women with known medical conditions (e.g., polycystic ovary syndrome, thyroid disorders) affecting fertility.
3. Women who underwent laparoscopy for non-infertility related reasons (e.g., suspected pelvic pathology without infertility).
4. Women with incomplete clinical records.

Data Collection Procedure: Data were collected by reviewing the medical records of eligible patients. Information collected included demographic details (age, duration of infertility), clinical history (e.g., history of infections, surgeries), and the findings from diagnostic laparoscopy. The pathologies identified during laparoscopy were categorized into tubal, endometrial, ovarian, uterine, and peritoneal factors. Additionally, surgical interventions (such as adhesiolysis, endometriosis resection, or tubal surgery) performed during laparoscopy were recorded.

Data Analysis: Descriptive statistics were used to summarize the demographic characteristics of the study population and the frequency of pelvic pathologies. Logistic regression analysis was performed to assess the relationship between endometriosis and tubal occlusion. The dependent variable in this analysis was tubal

occlusion, and the independent variable was the presence of endometriosis. A p-value of less than 0.05 was considered statistically significant. All analyses were performed using SPSS version 25.0.

RESULTS

A total of 106 women were included in the study. The mean age of the participants was 30.2 ± 4.6 years, and the median duration of infertility was 3.5 years (range 1-7 years).

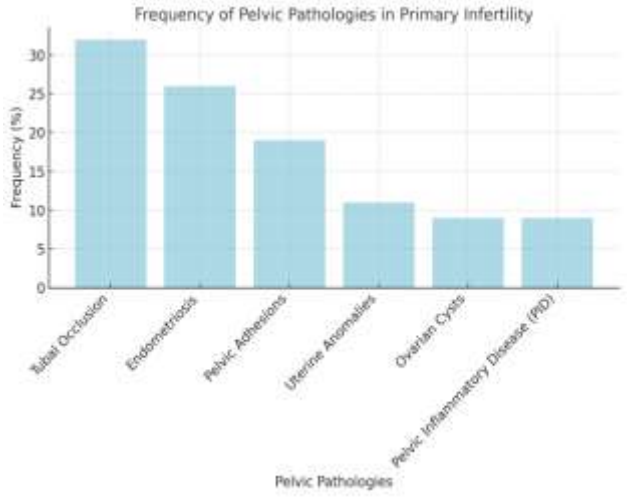
Table 1: Demographic Characteristics of the Study Population

Characteristic	Value
Mean Age (years)	30.2 ± 4.6
Median Duration of Infertility (years)	3.5 (range 1-7)
Age Group	
20-25 years	16 (15%)
26-30 years	45 (42%)
31-35 years	30 (28%)
36-40 years	15 (14%)

The most common pelvic pathologies identified were tubal occlusion (30%), endometriosis (25%), pelvic adhesions (18%), and uterine anomalies (10%). Other pathologies such as ovarian cysts and pelvic inflammatory disease (PID) were also observed, though less frequently.

Table 2: Frequency of Pelvic Pathologies in Primary Infertility

Pathology	Frequency (%)
Tubal Occlusion	32 (30%)
Endometriosis	26 (25%)
Pelvic Adhesions	19 (18%)
Uterine Anomalies	11 (10%)
Ovarian Cysts	9 (8%)
Pelvic Inflammatory Disease (PID)	9 (9%)



A significant association was observed between endometriosis and tubal occlusion (p=0.03). Additionally, pelvic adhesions were most commonly associated with previous pelvic infections (p<0.05).

Table 3: Association of Pelvic Pathologies in Primary Infertility

Pathology 1	Pathology 2	Association (p-value)
Endometriosis	Tubal Occlusion	0.03
Pelvic Adhesions	Previous Pelvic Infections	0.02

Logistic regression was performed to assess the relationship between endometriosis and tubal occlusion. The presence of endometriosis was found to significantly predict the likelihood of tubal occlusion (Odds Ratio = 2.58, 95% CI 1.47–4.89, p = 0.01).

Table 4: Logistic Regression Analysis of Endometriosis and Tubal Occlusion

Predictor	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Endometriosis	2.58	1.47–4.89	0.01

DISCUSSION

The results of this study confirm that pelvic pathologies, particularly tubal occlusion and endometriosis, are common causes of primary infertility. These findings align with several previous studies, which have consistently shown that tubal factor infertility is one of the leading causes of infertility in women[4,6]. The significant association between endometriosis and tubal occlusion in our study (p=0.01) highlights the intertwined nature of these conditions and the importance of early diagnosis.

Endometriosis remains a major contributor to infertility, affecting approximately 25% of the women in this study. The disease is known to cause both anatomic and functional impairment of the reproductive organs, often leading to tubal occlusion and ovarian cysts. The relationship between endometriosis and tubal infertility has been well-documented, and our results support the hypothesis that endometriosis can damage the fallopian tubes, leading to obstruction[5,7].

Pelvic adhesions, which were identified in 18% of our patients, are another major contributing factor to infertility. Adhesions can cause distortion of pelvic anatomy, interfering with the normal functioning of the fallopian tubes and ovaries. The presence of adhesions is often associated with previous pelvic surgeries, infections, or endometriosis[8].

Uterine anomalies, including septate and bicornuate uteri, were identified in 10% of the patients, which is consistent with previous studies that have reported an increased prevalence of these congenital defects in infertile women[9]. These anomalies can impair implantation, leading to infertility or early pregnancy loss.

CONCLUSION

This study emphasizes the importance of diagnostic laparoscopy in the evaluation of primary infertility. Tubal occlusion, endometriosis, and pelvic adhesions were identified as the most common causes of infertility in this cohort, with a significant association between endometriosis and tubal occlusion. Early diagnosis of these pathologies is critical for guiding appropriate treatment and improving fertility outcomes. Diagnostic laparoscopy not only provides valuable diagnostic information but also allows for simultaneous therapeutic interventions.

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This article may be cited as: Shabnam, Khan Z, Azam P, Karamat S, Razzaq Q, Khan J: Pelvic Pathologies in Primary Infertility: A Diagnostic Laparoscopy Study of 106 Patients. Pak J Med Health Sci, 2023;17(11):376-378.