



Office hysteroscopy in infertility workup: balancing precision and patient comfort

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Abstract

Introduction: Infertility is a growing global health concern that affects millions of couples, causing significant emotional, psychological, and social distress. Uterine abnormalities are recognized as a major contributing factor to female infertility, often remaining undiagnosed by conventional imaging techniques alone. Office hysteroscopy has emerged as a valuable, minimally invasive procedure that allows direct visualization of the uterine cavity, offering both diagnostic accuracy and patient comfort. Its role in identifying subtle intrauterine abnormalities makes it an essential component of modern infertility workup.

Methods: This cross-sectional study was conducted at a district-level hospital in Cox's Bazar, from January 2023 to December 2023, involving 95 women undergoing infertility evaluation. Women with known uterine anomalies previously diagnosed, active pelvic infections, or those unwilling to undergo hysteroscopy were excluded. Data were analyzed using the Statistical Package for the Social Sciences version 25.

Results: In this study of 95 infertile women, office hysteroscopy identified intrauterine abnormalities in 51.6% of cases, with endometrial polyps (16.8%) and intrauterine adhesions (11.6%) being the most common findings. A septate uterus was observed in 7.4% of women, primarily among those with primary infertility. A strong correlation (77.4%) was noted between abnormal hysterosalpingography and hysteroscopic findings. The procedure was well tolerated by 89.5% of patients, with only minor discomfort and no major complications reported.

Conclusion: This study demonstrates that office hysteroscopy is an effective, minimally invasive, and well-tolerated diagnostic tool for evaluating intrauterine abnormalities in infertile women, offering a reliable balance between diagnostic precision and patient comfort. With over half of the women in this study found to have intrauterine pathologies, particularly endometrial polyps, adhesions, and a septate uterus, office hysteroscopy significantly enhances the detection of subtle uterine factors that may contribute to infertility.

Keywords: Infertility, intrauterine abnormalities, office hysteroscopy, patient comfort

Introduction

Infertility is a significant global health concern affecting approximately 8–12% of couples of

reproductive age, with a notable psychological, social, and financial impact on affected individuals and families.^[1] Among the myriad causes of infertility, uterine abnormalities are recognized

as a critical factor, contributing to nearly 10–15% of female infertility cases.^[2] As the uterus plays an essential role in implantation and maintenance of pregnancy, accurate assessment of the uterine cavity has become an integral component of infertility evaluation. Hysteroscopy, regarded as the gold standard for diagnosing intrauterine pathologies, has revolutionized the evaluation and management of female infertility.^[3] Traditionally performed in an operating room under anesthesia, hysteroscopy enables direct visualization of the endometrial cavity, facilitating the detection and treatment of conditions such as endometrial polyps, submucous fibroids, intrauterine adhesions, and congenital uterine anomalies, all of which may impair fertility.^[4] However, conventional hysteroscopy is not without limitations, including increased cost, the need for anesthesia, logistical challenges, and patient apprehension.^[5] In recent years, office hysteroscopy has emerged as a minimally invasive, cost-effective alternative to traditional hysteroscopy. This technique involves performing hysteroscopic evaluation in an outpatient setting, usually without the need for general anesthesia or cervical dilatation, thereby significantly reducing patient discomfort and procedural risks.^[6] Advances in technology, including miniaturization of hysteroscopes and improved optics, have made office hysteroscopy a feasible and reliable tool in routine infertility workups.^[7] Moreover, office hysteroscopy offers the distinct advantage of “see and treat” capabilities, allowing immediate intervention for minor intrauterine abnormalities during the same session, thereby enhancing clinical efficiency.^[8] The role of office hysteroscopy in infertility workup is particularly emphasized in cases where non-invasive imaging modalities, such as transvaginal sonography (TVS) or hysterosalpingography (HSG), yield inconclusive or suspicious findings.^[9] While TVS and HSG remain valuable first-line investigations, their sensitivity and specificity in detecting certain subtle or complex intrauterine lesions are limited compared to direct visualization via hysteroscopy.^[10] Multiple studies have demonstrated that integrating office hysteroscopy into routine infertility assessment improves

diagnostic accuracy and may uncover previously undetected pathologies contributing to infertility. It contributes significantly to infertility evaluation by offering direct diagnosis of intrauterine abnormalities and allowing immediate operative correction – such as removal of polyps, adhesions, or septa – within the same setting.^[11] However, despite its clinical utility, concerns regarding patient comfort, tolerability, and procedural pain remain key considerations in the wider adoption of office hysteroscopy.^[12] Various factors influence patient experience, including instrument size, operator expertise, patient anxiety levels, and the use of pre-procedural analgesia or anxiolytics.^[13] As such, striking a balance between diagnostic precision and patient comfort is essential for optimizing the use of office hysteroscopy in infertility management.

This study aims to explore the evolving role of office hysteroscopy in the infertility workup, emphasizing its diagnostic accuracy, therapeutic potential, and strategies to enhance patient comfort.

Methods

This cross-sectional study was conducted at a district-level hospital in Cox’s Bazar from January 2023 to December 2023, involving 95 women undergoing infertility evaluation. Women with known uterine anomalies diagnosed previously, active pelvic infections, or those unwilling to undergo hysteroscopy were excluded. After thorough counseling, written informed consent was obtained from all participants. Ethical clearance was obtained from the Institutional Ethics Committee prior to initiation. All eligible women underwent office hysteroscopy using a 2.9 mm rigid hysteroscope with saline as the distension medium, performed without anesthesia or cervical dilatation. Indications included abnormal HSG, abnormal transvaginal ultrasound (TVUS) findings, unexplained infertility, or recurrent *in vitro* fertilization (IVF) failure. Demographic data, clinical history, hysteroscopic findings, patient tolerance, and complications were recorded.

Data were analyzed using the Statistical Package for the Social Sciences version 25, with results expressed as frequencies, percentages, and means, and appropriate statistical tests applied to compare findings between groups.

Results

The majority of women (44.2%) were between 26 and 30 years of age. Primary infertility was slightly more common (55.8%) than secondary infertility. The mean duration of infertility was 3.4 ± 1.9 years, ranging from 1 to 9 years [Table 1].

The most frequent indication was abnormal HSG findings (34.7%), followed by abnormal TVUS (31.6%) and unexplained infertility (24.2%). Repeated IVF failure accounted for 9.5% of cases [Table 2].

Intrauterine abnormalities were detected in 51.6% of women. Endometrial polyps (16.8%) were the most common pathology, followed by intrauterine adhesions (11.6%) and submucosal fibroids (9.5%). A normal cavity was observed in 48.4% of cases [Table 3].

The distribution of hysteroscopic abnormalities was comparable between primary and secondary infertility groups, with no statistically significant differences ($P > 0.05$). A higher, though not significant, incidence of a septate uterus was noted among women with primary infertility [Table 4].

In women with abnormal HSG, hysteroscopy confirmed intrauterine pathology in 77.4% of cases, whereas 22.6% showed normal findings, highlighting potential false-positive results from HSG [Table 5].

In figure showing the uterine cavity with an irregular endometrial lesion. It demonstrate the intrauterine mass and its hysteroscopic removal using a resectoscopic loop under direct visualization [Figure 1].

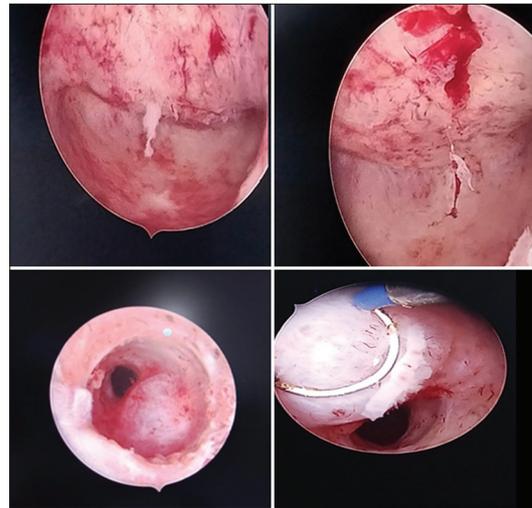


Figure 1: International Federation of Obstetrics and Gynecology Phase I submucous myoma (<50%)

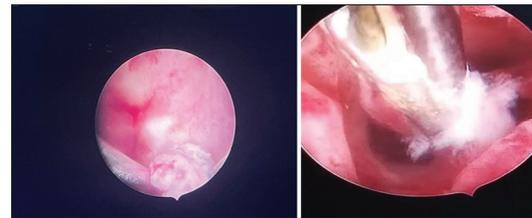


Figure 2: Submucous polyp



Figure 3: Submucous polyp

Hysteroscopic views showing a submucous polyp within the uterine cavity. The left image demonstrates the polyp arising from the endometrial surface, while the right image shows hysteroscopic removal of the polyp using operative instruments under direct visualization [Figure 2].

Table 1: Baseline characteristics of the study population ($n=95$)

Characteristics	Frequency (%) or mean \pm SD
Age (years)	29.8 \pm 4.5
Age group (years)	
20–25	18 (18.9)
26–30	42 (44.2)
31–35	25 (26.3)
>35	10 (10.5)
Type of infertility	
Primary	53 (55.8)
Secondary	42 (44.2)
Duration of infertility	3.4 \pm 1.9 years

SD: Standard deviation

Table 2: Indications for office hysteroscopy ($n=95$)

Indication	Frequency	Percentage
Abnormal HSG findings	33	34.7
Abnormal transvaginal ultrasound	30	31.6
Repeated IVF failure	9	9.5
Unexplained infertility	23	24.2
Total	95	100

IVF: *In vitro* fertilization, HSG: Hysterosalpingography**Table 3:** Hysteroscopic findings ($n=95$)

Finding	Frequency (%)
Normal uterine cavity	46 (48.4)
Endometrial polyp	16 (16.8)
Submucosal fibroid	9 (9.5)
Intrauterine adhesions (Synechiae)	11 (11.6)
Septate uterus	7 (7.4)
Hyperplastic endometrium	6 (6.3)

Hysteroscopic view of the uterine cavity showing thin intrauterine adhesions with fibrous bands extending across the endometrial surface, suggestive of mild intrauterine synechiae [Figure 3].

Endoscopic view showing snare polypectomy, with the snare loop positioned at the base of the polyp during resection [Figure 4].

Table 4: Comparison of hysteroscopic findings between primary and secondary infertility ($n=95$)

Finding	Primary ($n=53$) (%)	Secondary ($n=42$) (%)	<i>P</i> -value
Normal	25 (47.2)	21 (50.0)	0.78
Endometrial polyp	8 (15.1)	8 (19.0)	0.62
Submucosal fibroid	4 (7.5)	5 (11.9)	0.47
Intrauterine adhesions	7 (13.2)	4 (9.5)	0.53
Septate uterus	6 (11.3)	1 (2.4)	0.09
Hyperplastic endometrium	3 (5.7)	3 (7.1)	0.76

Table 5: Correlation between abnormal HSG and hysteroscopic findings ($n=31$)

Hysteroscopic finding	Frequency (%)
Confirmed abnormality	24 (77.4)
Normal cavity	7 (22.6)

HSG: Hysterosalpingography

**Figure 4:** Polypectomy

Discussion

The present study reinforces the clinical value of office hysteroscopy as a reliable, safe, and well-tolerated diagnostic tool in the infertility workup. In our study, intrauterine abnormalities were identified in 51.6% of women, whereas 48.4% had a normal uterine cavity. These findings are in agreement with recent literature, where reported rates of abnormal

findings during office hysteroscopy among infertile women range from 38% to 56%, depending on the population studied and inclusion criteria.^[14,15] In a large prospective study by Slabuszezewska-Jozwiak *et al.*, intrauterine abnormalities were detected in 44.5% of infertile women undergoing hysteroscopic evaluation, underscoring the high diagnostic yield of this approach.^[14] Endometrial polyps were the most frequently detected abnormality in our cohort (16.8%), followed by intrauterine adhesions (11.6%) and submucosal fibroids (9.5%). These findings are consistent with those of Di Spiezio Sardo *et al.*, who reported endometrial polyps and adhesions as the most common abnormalities in infertile women undergoing diagnostic hysteroscopy.^[3] Moreover, a systematic review by Bosteels *et al.* confirmed that removal of such pathologies through hysteroscopic intervention may significantly improve reproductive outcomes, particularly in women with unexplained infertility or prior ART failures.^[16] The detection of septate uterus in 7.4% of cases, predominantly among women with primary infertility, aligns with existing evidence suggesting a higher prevalence of congenital uterine anomalies in this subgroup. A recent study by Chang *et al.* emphasized the clinical relevance of identifying and correcting a septate uterus to improve fertility, with hysteroscopy considered the gold standard for diagnosis and treatment.^[17] Our findings also revealed a strong correlation between abnormal HSG and hysteroscopic confirmation, with 77.4% concordance. However, 22.6% of patients with abnormal HSG showed normal findings on hysteroscopy, illustrating the limitations of HSG as a stand-alone diagnostic tool. Similar discrepancies have been reported by Nanda *et al.* and by Wadhwa *et al.*, who highlighted that hysteroscopy offers superior accuracy in evaluating the uterine cavity, especially in cases where non-invasive imaging is inconclusive.^[18,19] Regarding patient tolerability, 89.5% of women in our study tolerated the procedure well, with only 10.5% reporting mild discomfort. Importantly, there were no procedure failures or conversions to operative hysteroscopy under anesthesia. These findings are consistent with recent trials by Buzzaccarini *et al.* and Ugboaja *et al.*, both of which demonstrated high patient acceptability and low complication rates with modern office

hysteroscopy techniques.^[12,20] The use of miniaturized hysteroscopic instruments, as applied in our study, has been shown to significantly reduce procedural discomfort and improve patient compliance.

Limitations of the study

The study was conducted in a single hospital with a small sample size. Hence, the results may not represent the whole community.

Conclusion

This study demonstrates that office hysteroscopy is an effective, minimally invasive, and well-tolerated diagnostic tool for evaluating intrauterine abnormalities in infertile women, offering a reliable balance between diagnostic precision and patient comfort. With over half of the women in this study found to have intrauterine pathologies, particularly endometrial polyps, adhesions, and a septate uterus, office hysteroscopy significantly enhances the detection of subtle uterine factors that may contribute to infertility.

Recommendations

Based on the findings of this study, office hysteroscopy should be incorporated as a routine diagnostic tool in the infertility workup, especially in cases with abnormal imaging or unexplained infertility. Its high diagnostic yield, minimal invasiveness, and excellent patient tolerability make it a practical and effective approach for early detection and management of intrauterine abnormalities.

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