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Dr. Prathyusha P
Postgraduate, Department of
Obstetrics and Gynecology, Sri
Siddhartha Medical College,
Tumkur, Karnataka, India

Dr. Dwarakanath L
Professor, Department of
Obstetrics and Gynecology, Sri
Siddhartha Medical College,
Tumkur, Karnataka, India

Dr. Rekha
Associate Professor,
Department of Anaesthesia,
Siddaganga Medical College,
Tumkur, Karnataka, India

Dr. Indira H
Professor and HOD,
Department of Obstetrics and
Gynecology, Sri Siddhartha
Medical College, Tumkur,
Karnataka, India

Corresponding Author:
Dr. Dwarakanath L
Professor, Department of
Obstetrics and Gynecology, Sri
Siddhartha Medical College,
Tumkur, Karnataka, India

Role of office hysteroscopy in the evaluation of uterine factors in infertile women

Prathyusha P, Dwarakanath L, Rekha and Indira H

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Abstract

Introduction: Infertility affects 10–15% of marriages, with uterine factors contributing to 15–20% of cases. Office hysteroscopy (OH) is a minimally invasive, anaesthesia-free procedure providing direct visualisation of the uterine cavity. This study aimed to evaluate the efficacy of OH in detecting uterine abnormalities in infertile women and its potential integration into gynaecological practice.

Materials and Methods: A cross-sectional observational study was conducted at Sri Siddhartha Medical College from April 2023 to September 2024. One hundred infertile women aged 21–40 years, presenting with primary or secondary infertility, were evaluated. Exclusion criteria included acute infections and systemic pathologies. After a detailed history, routine diagnostic evaluations, and counselling, participants underwent OH using a 2.9 mm hysteroscope in an outpatient setting without anaesthesia. Uterine abnormalities such as fibroids, polyps, and adhesions were documented. Data were analysed descriptively, comparing findings between primary and secondary infertility groups.

Results: Primary infertility (64%) was more prevalent than secondary infertility (36%). Submucosal fibroids (25%) and intrauterine adhesions (25%) were the most common findings in primary infertility, while secondary infertility showed adhesions (33.33%) as predominant. Normal hysteroscopic findings were observed in 44.44% of secondary infertility cases, unlike the primary group, which exhibited abnormalities in all cases.

Conclusion: Office hysteroscopy is a safe, effective, and well-tolerated diagnostic tool for evaluating uterine abnormalities in infertile women. Its ability to detect intrauterine pathologies supports its use as a first-line procedure, particularly in cases of unexplained primary infertility, to enhance targeted interventions and improve fertility outcomes. Further multicentre studies are recommended to validate these findings.

Keywords: Infertility, office hysteroscopy, uterine abnormalities, diagnostic tool

Introduction

Infertility is a reproductive health issue defined as the inability to achieve a clinical pregnancy after 12 months of regular, unprotected intercourse ^[1]. It affects about 10-15% of couples. Common causes include male factors (30-40%), uterine factors (15-20%), ovulatory disorders (30-40%), and tuboperitoneal issues (40-50%). Uterine abnormalities can interfere with implantation and placentation ^[2].

Hysteroscopy, introduced by Pantaleoni in 1869, is the gold standard for visualizing the uterine cavity ^[3]. Even with a normal hysterosalpingogram (HSG), laparoscopy can still detect peritubal adhesions, periadnexal adhesions, tubal pathology, and endometriosis in 35–68% of patients ^[2]. Throughout the years, this procedure has transitioned into a minimally invasive and less painful option, frequently conducted in an office environment without the necessity for anaesthesia or cervical dilation ^[4]. This advancement has reduced surgical interventions and associated risks, thereby enhancing patient compliance and achieving considerable cost savings. Furthermore, office hysteroscopy (OH) has demonstrated diagnostic accuracy comparable to procedures performed under anaesthesia while being safer and more efficient than traditional blind techniques. Patients typically experience favourable tolerability with office-based operative hysteroscopy, which minimises traumatic uterine manoeuvres and facilitates a direct approach to both the evaluation and treatment of various intrauterine pathologies within the same diagnostic session.

Hysteroscopy is commonly used for diagnosing and treating infertility. Operative hysteroscopy (OH) is safe and effective, with a complication rate of 0% to 1.5% and

diagnostic success rates reaching up to 94.8% (5,6). Despite the numerous advantages associated with office hysteroscopy (OH), its utilization remains limited. This disparity may be attributed to a lack of adequate training for physicians, obstacles related to the investment in capital equipment, and apprehensions regarding patient discomfort [6].

The present study is designed to evaluate the efficacy of office hysteroscopy in detecting uterine abnormalities in women experiencing infertility, with the intention of facilitating the integration of this procedure into gynaecological practice.

Materials and Methods

This cross-sectional observational study was conducted at the Department of Obstetrics and Gynecology, Sri Siddhartha Medical College and Hospital, between April 2023 and September 2024. The study enrolled 100 infertile women aged 21-40 years, presenting with either primary or secondary infertility. Inclusion criteria were women within the specified age range who provided informed consent. Exclusion criteria included women with acute pelvic inflammatory disease, acute vaginal or cervical infections, abnormal uterine bleeding, or endocrine abnormalities. Participants were recruited after proper counselling to ensure their understanding and voluntary participation.

Data collection involved a detailed and structured process. Each participant's comprehensive history was obtained, and demographic details, type and duration of infertility, and any prior investigations or treatments were documented. Routine diagnostic evaluations were performed to exclude systemic or pelvic pathologies, including complete blood count (CBC), hormonal profiles, and pelvic ultrasound. Office hysteroscopy, using a 2.9 mm hysteroscope, was conducted in an outpatient setting without anaesthesia to evaluate the uterine cavity. Observations were meticulously documented, such as the presence of fibroids, adhesions, polyps, uterine anomalies, or intrauterine synechiae.

Data were analysed descriptively. Frequencies and percentages were calculated to summarise demographic characteristics, clinical history, and hysteroscopic findings. Comparative observations between primary and secondary infertility groups were reported narratively. The descriptive approach provided valuable insights into the prevalence and

distribution of uterine abnormalities in the study population, emphasising the role of office hysteroscopy in infertility evaluation.

Results

The study included 100 infertile women, with a majority in the 26-30 age group (48%), followed by 20-25 years (32%), 31-35 years (14%), and 36-40 years (6%). Most participants were from rural areas (60%) and predominantly belonged to the lower-middle socioeconomic class (44%), with 32% in the lower class and 24% in the upper-middle class. Body mass index analysis showed that 38% were obese, 22% were overweight, and 40% had a normal BMI. Regular menstrual cycles were reported by 76% of participants, and only 10% had a history of hypertension. These demographic and clinical details underline the heterogeneity of the study population. (Table 1)

Hysteroscopic evaluation revealed significant findings, especially in women with primary infertility (64% of cases). (Figure 1) Submucosal fibroids and intrauterine adhesions were the most common abnormalities in this group, each accounting for 25% of cases. Other findings included endometrial polyps (12.5%), cervical polyps (12.5%), cervical stenosis (6.25%), sub septate uterus (6.25%), uterine anomalies (6.25%), intrauterine synechiae (6.25%). Notably, no cases of endometrial hyperplasia or normal hysteroscopic findings were observed in this group. These results emphasise the role of office hysteroscopy in detecting uterine pathologies in women with primary infertility, which may aid in targeted interventions and improve fertility outcomes. (Table 2)

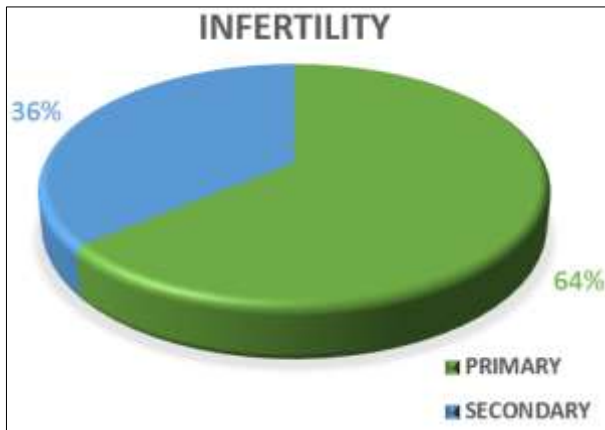
In contrast, secondary infertility (36% of cases) showed a different spectrum of findings. Adhesions were the most frequent abnormality (33.33%), followed by endometrial polyps (11.11%) and endometrial hyperplasia (11.11%). Interestingly, a significant proportion of women with secondary infertility (44.44%) had normal hysteroscopic findings, highlighting a potential difference in the underlying uterine factors between primary and secondary infertility. The findings reinforce the value of office hysteroscopy as a diagnostic tool, enabling clinicians to tailor treatment strategies based on the specific uterine abnormalities detected in infertile women.

Table 1: Demographic Details

Variable	Frequency	Percentage	
Age	20-25	32	32%
	26-30	48	48%
	31-35	14	14%
	36-40	6	6%
Population Distribution	Rural	60	60%
	Urban	40	40%
Socioeconomic Status	Upper Middle	24	24%
	Lower Middle	44	44%
	Lower	32	32%
Socioeconomic Status	Normal	40	40%
	Overweight	22	22%
	Obese	38	38%
Menstrual Cycle	Regular	76	76%
	Irregular	24	24%
Hypertension	Yes	10	10%
	No	90	90%

Table 2: Comparison of Hysteroscopy Findings in Primary and Secondary Infertility

Hysteroscopy Findings	Primary		Secondary	
	Frequency	Percentage	Frequency	Percentage
Submucosal Fibroid	16	25%	0	0%
Adhesions	16	25%	12	33.33%
Endometrial Polyp	8	12.50%	4	11.11%
Cervical Stenosis	4	6.25%	0	0%
Cervical Polyp	8	12.50%	0	0%
Subseptate Uterus	4	6.25%	0	0%
Uterine Anomalies	4	6.25%	0	0%
Intrauterine Synechiae	4	6.25%	0	0%
Endometrial Hyperplasia	0	0%	4	11.11%
Normal	0	0%	16	44.44%

**Fig 1:** Pie chart showing distribution of Infertility

Discussion

Infertility is a prevalent concern encountered by many medical practitioners. Uterine abnormalities contribute significantly to cases of female infertility. Hysteroscopy is the gold standard for evaluating the uterine cavity and can be safely performed in an office setting. It offers high diagnostic accuracy at a lower cost and is well-accepted by patients compared to traditional methods [4]. This approach is particularly beneficial for patients from rural areas or lower socioeconomic backgrounds, as it provides an accessible and minimally invasive means of diagnosing conditions that would otherwise remain undetected.

In the present study, outpatient hysteroscopy findings were assessed in 100 infertile cases. The majority of the subjects were aged between 26 and 30 years or 20 and 25 years. Furthermore, most patients resided in rural areas and belonged to the lower-middle socioeconomic class. Similar demographic patterns have been identified in studies conducted by Nourag *et al.* [11], Sharma *et al.* [8], Gammo *et al.* [7], and Makled *et al.* [9].

The findings of the present study indicated that primary infertility was more prevalent than secondary infertility in this sample. Nourag *et al.* reported that 68% of cases involved primary infertility, while Gammo *et al.* [7] and Sharma *et al.* [8] recorded rates of 70% and 63%, respectively. In contrast, Makled *et al.* [9] and Al-Bromboly *et al.* [10] reported a higher prevalence of secondary infertility, constituting 60% and 59.5% of their cases, respectively.

In the present study, none of the cases in the primary infertility group exhibited normal hysteroscopic findings; intriguingly, 44% of the secondary infertility group demonstrated abnormal findings. In the primary infertility cohort, submucosal fibroids/myomas and intrauterine

adhesions ranked as the most frequently observed abnormalities. In the secondary infertility group, intrauterine adhesions were identified as the most common abnormality, followed by endometrial polyps.

Infertility related to myomas may result from chronic endometrial inflammation, abnormal blood vessel formation, increased uterine contractions, and irregular hormonal patterns, all of which can impede sperm transport and embryo implantation. Hysteroscopic removal of endometrial polyps is a minimally invasive treatment for women facing infertility, potentially improving pregnancy rates from 23% to 65%.

Al-Bromboly *et al.* [10] identified that the most frequently reported hysteroscopic abnormality in cases of primary infertility was the presence of an intrauterine septum, while intrauterine synechiae were the predominant finding in cases of secondary infertility. According to Nourag *et al.* [6], the commonest causes of combined primary and secondary infertility included endometrial polyps (30%) and hyperplastic endometrium (14%). Sharma *et al.* [8] noted that hysteroscopic anomalies included myomas and polyps in 10 (7.7%) of women with unexplained infertility, alongside synechiae in 5 (3.8%) of the participants. Furthermore, Makled *et al.* [10] reported that 31% of their cases involved endometrial polyps and 15% involved endometrial hyperplasia, designating these conditions as the primary causes of infertility in their research. Similarly, Gammo *et al.* [7] found that endometrial polyps were the leading cause of infertility, accounting for 20% of cases, while submucosal myomas and adhesions each accounted for 3%. This study confirms the value of office hysteroscopy as a diagnostic tool for evaluating uterine abnormalities in infertile women, particularly those with primary infertility. The findings indicate a higher prevalence of submucosal fibroids and adhesions among cases of primary infertility, corroborating other studies which identify these abnormalities as significant contributors to infertility. This study recommends office hysteroscopy as a first-line tool in cases of unexplained primary infertility, offering a cost-effective solution that is well tolerated by patients. This study's limitations include a restricted sample size and a single-center scope. Future multi-center studies are encouraged to further validate these findings and assess fertility outcomes following treatment.

Conclusion

Office hysteroscopy serves as a vital diagnostic tool for the evaluation of uterine factor infertility. This study emphasises its role as a primary diagnostic procedure for the identification of intrauterine abnormalities in women experiencing infertility. Facilitating real-time diagnosis

promotes timely management and has the potential to improve fertility outcomes.

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