

Impact of Hysteroscopy on Patients with Secondary Infertility

Abd El-monsef Abdelghaffar Moustafa

¹Obstetrics and gynecology Departments, Faculty of Medicine, Al-Azhar University, Egypt

*Corresponding author: Abd El-monsef Abdelghaffar Moustafa, E mail: princemonsef555@gmail.com

Mobile phone: +20 122 731 6530

ABSTRACT

Background: decreased rates of gestation are detected in cases with uterine space irregularities. The correction of these irregularities was accompanying with better rates of gestation. Diagnostic hysteroscopy could be accomplished with negligible distress and higher sensitivity and specificity in assessment of the uterine space.

Objective: This study aimed to assess the role of hysteroscopy in diagnosing the abnormalities of the uterine space among females having secondary infertility.

Subjects and methods: This work was conducted on 138 cases having secondary infertility with no suspected uterine defect at the Gynecological Outpatient Clinic in Al-Hussein University Hospital, Al-Azhar University.

Result: The majority of the patients had hysteroscopy as part of their infertility treatment (77.5 percent). Among the patients investigated, there was a statistically significant difference between pre-hysteroscopic diagnostic and hysteroscopy findings. There were also 76 females with normal hystero-graphy and US, and 18 females with abnormal hysteroscopy results, resulting in an NPV of 86.8% for both ultrasonography and hystero-graphy.

Conclusion: hysteroscopy was the most precise diagnostic examination for lesions in comparison with ultrasonography. The technique was of limited usage in the diagnosing of intra-uterine adhesions and some uterine deformities, while its global consequences in diagnosis of uterine deformities were better than those attained by ultrasonography.

Keywords; Secondary, Infertility, Hysteroscopy, Findings.

INTRODUCTION

Secondary infertility is defined as the incapability to conceive a fetus or has a gestation to full-term thereafter formerly giving delivery. This condition cause recurrent pregnancy with ability to conceive but disability carry to term. The preceding delivery should have happened with no assistance from fertility drugs or treatment, like in vitro fertilizations. Secondary infertility characteristically detected afterward unsuccessful conceive for 6-mths to a 1-yr⁽¹⁾.

Globally approximately 10-15% of the couples are infertile and the primary and secondary infertility rates are 67.3% & 32.6% respectively from total number of infertile subjects. Prevalence of secondary infertility elevated abruptly with age, from 2.60% (2.30%-3.00%) in women aging between 20 & 24 years to 27.10% (24.70%-29.90%) in women aging between 40 & 44 years⁽²⁾.

Most endometrial pathologies concerned in infertility cause both structural and functional damages⁽³⁾. Consequently, endometrial space evaluation must be comprised in the assessment of non-fertile couples. This may be performed through TVS, hystero-salpingography (HSG), sono-hystero-graphy and hysteroscopy⁽⁴⁾.

However, the WHO recommends HSG alone, for managements of non-fertile females that may be owing to its capability to deliver information concerning tubal patency⁽⁵⁾. Nevertheless, hysteroscopy is a more precise tool owing to the elevated false-positive and false negative rates of intra-uterine abnormalities with HSG⁽⁶⁾. Furthermore, anomalous hysteroscopy results are significantly elevated in cases with preceding ART failures. Hysteroscopy can be realized as a positive prognostic factor for accomplishing of gestation in

following IVF procedures in females with a history of recurrent implantation failures (RIF)⁽⁷⁾.

Aim of the work was to assess the advantage of hysteroscopy in diagnosing the abnormalities of the uterine-space among females having secondary infertility 12-mths or more of steady un-protected intercourses and having normal uterine-space by 2DUS and normal H.S.G.

PATIENTS AND METHODS

The present study was conducted on 138 patients having secondary infertility with no suspected uterine defect, aged between 20 and 40 years attending the Gynecological Outpatient Clinic in Al-Hussein University Hospital, Al-Azhar University.

Patient selection and inclusion criteria:

Women aged 20-40 years, women with secondary infertility (12 months or more after last pregnancy with regular sexual intercourse without lactation), females with ordinary uterine space by 2 DUS and women with a normal uterine-space by hysterosalpingography following last pregnancy.

Exclusion criteria: Women with untreated cervicitis, women with undiagnosed AUB, women with cardiac disease and other diseases contraindicating hysteroscopy or pregnancy, women who refuse to join our study and women with any uterine abnormality in 2 DUS or HSG.

All patients were subjected to the following:

History taking and general examinations [BMI, vital signs, abdominal and pelvic examination, base line 2D transvaginal ultrasound and review of the recent HSG (less than 1 year) and documentation].

Technique of hysteroscopy:

Diagnostic hysteroscopy has been achieved throughout the proliferative stage of the menstrual cycle. A rigid 0.29-cm hystroscope has been utilized with a 30° forward oblique lens and an outer sheath diameter of 0.5cm (Karl Storz GmbH, Tuttlingen, Germany) in this study (8). Distilled water solution has been utilized to distend the uterine space. The pressures of the swelling media kept from 60 to 100 mmHg. Hysteroscopy has been achieved using no touch method (vagoscopy method) as presented by Bettocchi and Selvaggi (9).

The uterine-space was systematically inspected preliminary by its frontal and backward walls, the fundus, and the boundaries. The size and equality of the tubal orifices was observed and any pathology found at the tubal orifices (adhesions, polyps or hyperemia or inflammatory changes) was reported. Passages of any air bubbles in the irrigation fluid to tubal ostia have been stated. If no bubbles of air are detected at all, two ml of air will be injected into the rubber end of the sterilized infusions set to be realized by the hysteroscope operator. Hysteroscopic bubble suction examination was measured positive if air bubble suction by the ostium is realized on the patent side within one minute. Throughout this retro, neither injections of air nor elevated pressures were accomplished. If no suction of bubbles occur, the operator will pause for 1 minute more. Once more, if no suction occurs, the examination was measured negative (10). The pathologies, time of procedure (from insertion of the hysteroscope through the vagina till complete removal). Subjective ease of procedure was determined by the observer.

Study outcome:

Intrauterine hysteroscopic findings (whether normal or pathologic) and the type and degree of pathology present.

Ethical considerations:

Study protocol was submitted for approval by the Ethical Committee of Faculty of Medicine, AL Azhar University and Ethical Committee of the Obstetrics and Gynecology Department. Informed verbal and written agreement was attained from all participants sharing in the work after explanation of the purpose and procedures of the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical Analysis

Collected data was statistically analyzed via the windows-based SPSS-20 (IBM, USA). In accordance to the kind of data qualitative introduces as numbers and percentages, quantitative continues group introduced as mean ± SD, the next examinations have been utilized to

test variances for significance; comparison among frequencies and percentages in groups were done using Chi-square testing. Comparison among parametric quantitative non-dependent groups by student testing P-value was significant at <0.05 & high significant at < 0.001.

RESULTS

This table showed that patients' age ranged from 20 to 40 years with mean BMI of 27.54 kg/m². Majority of the patients were rural (Table 1).

Table (1): Demographic characteristics among studied patients

		Patients (n=138)
Age (years)	Mean ± SD	28.63 ± 6.12
	Range	20 – 40
BMI (kg/m²)	Mean ± SD	27.54 ± 3.65
	Range	22 – 32
Residence	Urban	60 (43.5%)
	Rural	78 (56.5%)

Majority of the patients underwent hysteroscopy as per infertility workup (77.5%) (Table 2).

Table (2): Hysteroscopy indications among studied patients

	Patients (n=138)	
	N	%
As per infertility workup	107	77.5
Before IVF treatment	24	17.4
After IVF treatment	7	5.1

Majority of the patients showed normal hysteroscopy (60.9%) (Table 3).

Table (3): Hysteroscopy findings among studied patients

	Patients (n=138)	
	N	%
Normal	84	60.9%
Abnormal	54	39.1%

Table (4) showed that there was statistically significant difference between Pre- hysteroscopic diagnosis and hysteroscopy findings among the studied patients.

Table (4): Association between Pre-hysteroscopic diagnosis and hysteroscopy findings among the studied patients

Pre-hysteroscopic diagnosis	Hysteroscopy		Total	p
	Abnormal	Normal		
Abnormal	44 (71%)	10 (13.2%)	62 (44.9%)	<0.001
Normal	18 (29%)	66 (86.8%)	76 (55.1%)	
Total	54 (100%)	84 (100%)	138	

This table showed that between 76 females who had ordinary hystero-graphy and US, there were 18 females had anomalous results from hysteroscopy for a NPV of 86.8% for both ultrasound and hystero-graphy (**Table 5**).

Table (5): diagnostic accuracy of hysteroscopy on patients with secondary infertility

Statistic	Value	95% CI
Sensitivity	81.48%	68.57% - 90.75%
Specificity	78.57%	68.26% - 86.78%
Positive Predictive Value	70.97%	61.42% - 78.96%
Negative Predictive Value	86.84%	78.86% - 92.11%
Accuracy	79.71%	72.03% - 86.07%

DISCUSSION

Low rates of gestations are detected in cases with uterine space irregularities. The correction of these irregularities was accompanied by better rates of gestation. Diagnostic hysteroscopy could be accomplished with negligible distress and higher sensitivity and specificity in assessment of the uterine space⁽¹¹⁾. Hysteroscopy investigation maybe better than hystero-graphy in assessing the endometrial space. Moreover, anomalous hysteroscopy results were stated in cases with ordinary hystero-graphy or TVS. Diagnostic hysteroscopy was recognized to have better sensitivity and specificity in assessing the endometrial space⁽¹²⁾.

Anomalous hysteroscopic results are significantly elevated in cases with preceding ART failures and hysteroscopy can be seen as a positive predictive factor for accomplishing gestation in following IVF procedures in cases with RIF history⁽¹³⁾. Majority of the patients underwent hysteroscopy as per-infertility workup (77.5%). Majority of the patients showed normal hysteroscopy (60.9%).

Along with our results **El Huseiny & Soliman**,⁽³⁾ reported that anomalous hysteroscopic results existed more in cases with secondary infertilities 24.70%. This could be because of interference connected to preceding gestations like dilatations and curettages or preceding CS. Supportive to this is the elevated prevalence of intra-uterine adhesions, in comparison with other lesions. Also, an old study **Kessler & Lancet**⁽¹⁴⁾, reported that about 66% of hysteroscopy findings weren't associated with those detected on hystero-graphy. It was revealed that 54.30% of intra-uterine adhesions detected on hystero-graphy weren't detected on straight hysteroscopy examinations. Also **Wadhwa et al.**⁽¹⁵⁾ reported that anomalous hysteroscopy results were noticed in 35.71% (10/28) cases with secondary infertility. In the report by **Sharma et al.**⁽¹⁶⁾ grade-IV adhesions were the commonest (38.40% in group-1 and 9.50% in group-2), followed by grade-III (15.10% in group-1 and 42.90% in group-2) and grade-II (15.10% in group-1 and 14.0% in group-2).

The most common finding on hysteroscopy in **Wadhwa et al.**⁽¹⁵⁾ was ostial fibrosis in (9.34%) secondary infertile females, pale or atrophic endometrium 8 (7.5%): endometrial polyp in 5 (4.67%): and Asherman's syndrome in 5 (4.7%) cases. **Taskin et al.**⁽¹⁷⁾ as well revealed that uterine septum or sub-septum (9.5%) was the commonest result in their report shadowed by endometrial polyp (6.89%). Endometrial polyp was the commonest in secondary infertile females. They revealed that Asherman's syndrome in comparatively lesser cases (0.1%) than the study by **Vaid et al.**⁽¹⁸⁾, which can be as most of their patients were of male's factor infertility. **Chauhan et al.**⁽¹⁹⁾ revealed that submucous fibroids and congenital deformities were in 6.0% of the cases as the commonest uterine irregularities noticed in their work on hysteroscope. **Vaid et al.**⁽¹⁸⁾ showed that ostia fibrosis was in 15.0% as commonest result then intra-uterine adhesions then polyp/myoma 11.9% and 6.2%, respectively on hysteroscopy. In **Wadhwa et al.**⁽¹⁷⁾ uterine adhesions were accompanying with Asherman's syndrome in 4.7% cases. Hysteroscopy interventions were accomplished in 28.7% (30/107) of cases.

The informed frequency of myomas in non-fertile females with no any clear reason of sterility is valued to be from 1.0 to 2.4 %. In **Pansky et al.**⁽²⁰⁾ study, submucous myomas have been detected in 4.30% of cases with secondary infertility. Another recent study by **Siddiqui et al.**⁽²¹⁾ doesn't go with our results as reported endometritis in 3.8% of secondary infertility and cervical stenosis in 1% only. The most common cause was endometrial polyp with 15.4% then uterine synechiae with 14.4%. Intra-uterine adhesion (uterine synechiae) was detected in 15 patients of secondary sub-fertility.

In our study, among 76 females who had ordinary hystero-graphy and US, 18 females had anomalous results on hysteroscopy, for a NPV of 86.8% for both

ultrasound and hystero-graphy. **Gandotra**,⁽²²⁾ reported that hysteroscopy provides cost-effective, comprehensive and a diagnostic aid and simultaneous therapeutic treatment in infertile patients. It delivers straight visualizations of the conditions as well a chance to manage the same if operative treatment is needed. It as well contributed to the management strategy in the infertile cases. In the patients of secondary infertility, there were 2 patients (16.7%) each with fibroid, intrauterine adhesions, endometrial, polyp and uterine septum has been detected in 6.10% (2) cases each. In the patients of secondary infertility, most common abnormality noted was intrauterine adhesions in about 12.1%. In the study conducted by **Vaid et al.**⁽¹⁸⁾, intrauterine adhesions were observed in about 11.91% patients as a result of previous history of curettage done in them. In our work, uterine myoma was the commonest irregularity detected by hysteroscope. Myomas were as well detected in many other reports. **Puri et al.**⁽²³⁾ (8%) and **Bhat et al.**⁽²⁴⁾ (7.05%). Thus showing that myomas affect infertility receptive implantation site. Cervical stenosis was the most common founding in 6% patients in **Gandotra**,⁽²²⁾ study, which correlates with reports performed by **Makled KA et al.**⁽²⁵⁾ (6%) and **Sahu et al.**⁽²⁶⁾ (6.48%). Uterine septum was noted in 4% patients in the same study which is near to our findings. **Puri et al.**⁽²³⁾ reported that endometriosis was detected in 26.90% cases in secondary infertility group.

As regards uterine pathology in cases with secondary infertility, 11.50% had sub-mucous polyp and 3.8% had uterine septum. Similar to our study endometriosis is the 2nd commonest reason detected by **Puri et al.**⁽²³⁾. Endometriosis can persuade infertilities as a consequence of anatomic distortions and adhesions. Histologic examinations must be performed to settle the existence of endometrial lesions, particularly those with non-classical appearances, but laparoscopy is the commonest utilized method in endometriosis diagnosis.

CONCLUSION

Hysteroscopy was the most precise diagnostic examination for lesions in comparison with ultrasonography. The technique was of limited usage in diagnosing of intra-uterine adhesions and some uterine deformities, while its global consequences in diagnosis of uterine deformities were better than those attained by US.

DECLARATIONS

Consent for Publication: I confirm that all authors accepted the manuscript for submission

Availability of data and material: Available

Competing interests: None

Funding: No fund

Conflicts of Interest: The authors declared no conflicts of interest regarding the publication of this paper.

REFERENCES

1. **Cohen S, Bouaziz J, Bar A et al. (2020):** Fertility success rates in patients with secondary infertility and symptomatic cesarean scar niche undergoing hysteroscopic niche resection. *Gynecological Endocrinology*, 36 (10): 912-916.
2. **Benksim A, Elkhoudri N, Addi R et al. (2018):** Difference between primary and secondary infertility in Morocco: frequencies and associated factors. *International journal of fertility & sterility*, 12 (2): 142.
3. **El Huseiny A, Soliman B (2013):** Hysteroscopic findings in infertile women: a retrospective study. *Middle East Fertility Society Journal*. 18 (3): 154-8.
4. **Zhu H, Fu J, Lei H et al. (2016):** Evaluation of transvaginal sonography in detecting endometrial polyps and the pregnancy outcome following hysteroscopic polypectomy in infertile women. *Experimental and therapeutic medicine*, 12 (2): 1196-200.
5. **Omidiji O, Toyobo O, Adegbola O et al. (2019):** Hysterosalpingographic findings in infertility—what has changed over the years?. *African health sciences*, 19 (2): 1866-74.
6. **Stefanescu A, Marinescu B (2012):** Diagnostic hysteroscopy a retrospective study of 1545 cases. *Maedica*, 7 (4): 309.
7. **Cenksoy P, Ficicioglu C, Yildirim G et al. (2013):** Hysteroscopic findings in women with recurrent IVF failures and the effect of correction of hysteroscopic findings on subsequent pregnancy rates. *ArchGynecol Obstet.*, 287 (2): 357–60.
8. **Fouda U, Gad Allah S, Elshaer H (2016):** Optimal timing of misoprostol administration in nulliparous women undergoing diagnostic Hysteroscopy: a randomized double-blind placebo-controlled study. *Fertil Steril.*, 106 (1): 196-201.
9. **Bettocchi S, Selvaggi L (2014):** Avagino scopice approach to reduce the pain of diagnostic hysteroscopy. *The Journal of the American Association of Gynecologic Laparoscopists*, 4 (2): 255-8.
10. **Darwish A, Hassanin A, Aleem M et al. (2016):** An overview of vaginoscopic diagnostic hysteroscopy for prediction of tubal patency and peristalsis among infertile women: a preliminary study. *Gynecological Surgery*, 13 (3): 187-92.
11. **Carson S, Kallen A (2021):** Diagnosis and Management of Infertility: A Review. *JAMA.*, 326 (1): 65-76.
12. **Louis F, Lulla C (2020):** Hysteroscopy is Superior to 3D Ultrasound in Gynecological Diagnosis. *The Journal of Obstetrics and Gynecology of India*, 70 (6): 447-461.
13. **Ajayi A (2019):** Pathological Findings from Laparoscopy and Hysteroscopy Procedural Assessments of the Pelvic Environment and the Uterine-space among Infertile Black Women in a Sub-Sahara African Country-Nigeria. *EC Gynaecology*, 8: 800-813.
14. **Kessler I, Lancet M (1986):** Hystero-graphy and hysteroscopy: a comparison. *Fertility and sterility*, 46 (4): 709-710.
15. **Wadhwa L, Rani P, Bhatia P (2017):** Comparative Prospective Study of Hysterosalpingography and Hysteroscopy in Infertile Women. *Journal of human reproductive sciences*, 10 (2): 73–78.

16. **Sharma J, Roy K, Pushparaj M *et al.* (2009):** Hysteroscopic findings in women with primary and secondary infertility due to genital tuberculosis. *International Journal of Gynecology & Obstetrics*, 104 (1): 49-52.
17. **Taskin E, Berker B, zmen B *et al.* (2011):** Comparison of hysterosalpingography and hysteroscopy in the evaluation of the uterine-space in patients undergoing assisted reproductive techniques. *Fertility and sterility*, 96 (2): 349-352.
18. **Vaid K, Mehra S, Verma M *et al.* (2014):** Pan endoscopic approach “hysterolaparoscopy” as an initial procedure in selected infertile women. *Journal of clinical and diagnostic research*, 8 (2): 95.
19. **Chauhan M, Lakra P, Nanda S *et al.* (2013):** Hysterosalpingography vs hysteroscopy: role in assessment of uterine factor during infertility workup. *International Journal of Infertility & Fetal Medicine*, 4(3), 79-82.
20. **Pansky M, Feingold M, Sagi R *et al.* (2006):** Diagnostic hysteroscopy as a primary tool in a basic infertility workup. *JSLs: Journal of the Society of Laparoendoscopic Surgeons*, 10 (2): 231.
21. **Siddiqui M, Ghafoor N, Naznine F *et al.* (2020):** Hysteroscopic Evaluation in Infertility: Bangladesh Perspective. *Journal of South Asian Federation of Obstetrics and Gynaecology*, 12 (1): 8.
22. **Gandotra N (2018):** Role of diagnostic hysteroscopy in establishing the diagnosis of female infertility, 2 (6): 27-30.
23. **Puri, S, Jain, D, Puri S *et al.* (2015):** Laparohysteroscopy in female infertility: a diagnostic cum therapeutic tool in Indian setting. *International Journal of Applied and Basic Medical Research*, 5 (1): 46.
24. **Bhat V, Joshi P, Merlin J (2013):** Value of diagnostic hysteroscopy in infertility as first line investigation. *Journal of Evolution of Medical and Dental Sciences*, 2 (4): 343-349.
25. **Makled A, Farghali M, Shenouda D (2014):** Role of hysteroscopy and endometrial biopsy in women with unexplained infertility. *Archives of gynecology and obstetrics*, 289 (1): 187-192.
26. **Sahu L, Tempe A, Gupta S (2010):** Hysteroscopic evaluation in infertile patients: a prospective study. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 1(1): 37-41.