



Role of hysteroscopy in evaluation of infertility: A retrospective observational Study

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Abstract

Objective: To determine role of hysteroscopy in evaluation of infertility.

Method: A retrospective observational study was carried out at Gynaecology endoscopy unit, PSRI, DELHI, over a period of one year. Total 100 Infertile women were included in the study. Hysteroscopy was performed by using 2.9mm 300 BETTOCHI hysteroscope. Data was collected from the medical records department of the hospital.

Result: Among 100 women, abnormal hysteroscopic findings were found in 56% women, majority of which (76.8%) were with primary infertility and 60.7% were of age ≥ 30 years. The most common uterine cavity abnormality was intrauterine adhesions (46.4%). Among these, majority of the adhesions were of grade I (65.4%). Endometrial polyp, subseptate uterus, submucous myoma, and unicornuate uterus was seen in 23.2%, 12.5%, 8.9%, and 1.7% cases respectively. Since hysteroscopy was able to identify intrauterine pathologies in 56% of women with infertility, it should be considered as a routine investigation in evaluation of infertile woman.

Keywords: Infertility, hysteroscopy, intrauterine adhesions, endometrial polyp

1. Introduction

Infertility is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" according to WHO revised glossary of assisted reproductive technology (ART). It affects 10-15% of infertile couples [1]. Infertility related to uterine cavity abnormalities has been estimated to be the causal factor in as many as 10% to 15% of couples seeking treatment. Moreover, abnormal uterine findings have been found in 34% to 62% of infertile women [2]. These uterine pathologies result in structural and functional impairment of endometrium, thus making the endometrium unfit for implantation. Hence, assessment of uterine cavity should be included in work up of an infertile couple.

The tools to assess uterine cavity are Transvaginal ultrasonography (TVS), Hysterosalpingography (HSG), Saline infusion sonography (SIS) and Hysteroscopy.

Transvaginal ultrasonography (TVS) is the simplest imaging examination which is non-invasive, cost effective and has high clinical significance. It helps in evaluation of size, shape, volume and contour of the uterine cavity and determination of any intrauterine pathology. The overall sensitivity and specificity of intrauterine abnormalities is 79% and 82% [3]. However, TVS carries some limitations which are inability to detect the endometrial changes such as endometritis and synechiae, difficulty in differentiating between a polyp and a fibroid. Also, tubal patency cannot be assessed on transvaginal sonography.

HSG is helpful in defining size and shape of uterine cavity. It can reveal congenital (unicornuate, septate, bicornuate uteri) and acquired uterine anomalies (polyp, sub mucous myoma, synechiae). All intrauterine pathology like polyp, myoma, synechiae or septa appears as a filling defect on HSG. To further differentiate these lesions either TVS or hysteroscopy is required to be done. So, HSG has a

relatively low sensitivity of 50% and positive predictive value 30% for diagnosis of endometrial polyp and sub mucous myoma in infertile women [4].

SIS is a minimally invasive cost-effective diagnostic modality. It gives an excellent anatomic detail of the uterus and has been shown to be highly accurate in the diagnosis of polyp, endometrial hyperplasia, and various uterine anomalies. The pooled sensitivity of SIS in the detection of all intrauterine abnormalities was 88% with specificity of 94% [5].

Hysteroscopy is considered as gold standard in the diagnosis of intrauterine pathology. However, WHO recommends office hysteroscopy in females who are suspected of intrauterine abnormality on clinical basis or complementary exams (ultrasound, HSG) or after in vitro fertilization (IVF) failure. But many clinicians feel that direct view of the uterine cavity offers a significant advantage over other blind or indirect diagnostic methods, so even when no abnormality is found with these tools, hysteroscopy should be considered.

Thus, this study is being done to determine role of hysteroscopy for evaluation of uterine cavity abnormalities in an infertile couple.

2. Material and Methods

This retrospective observational study was carried out at Gynaecology endoscopy unit, PSRI, DELHI, over a period of one year from March 2015 to February 2016. 100 Infertile women who underwent hysteroscopy were included in the study.

After detailed clinical evaluation, all patients were informed regarding the procedure and written informed consent was taken. Hysteroscopy was performed in operation theatre by using 2.9mm 300 BETTOCHI hysteroscope with additional 1mm sheath and HD camera. No prior cervical dilatation was done. All procedures were done under general

anaesthesia by same surgeon. Distension of uterine cavity was achieved with normal saline by pressure bag or Endomat. Hamou Endomat was used as fluid delivery system with inflow pressure of 150 mm Hg and outflow pressure of 0.5 bars. Endocervical canal followed by whole uterine cavity with all four walls and bilateral ostias were visualised. Endometrial biopsy was taken for histopathological examination under direct vision if required. If any pathology like intrauterine adhesions, polyp, myoma or septa was diagnosed, operative procedure was done at the same sitting. Video recording of each procedure was done for future reference.

Data was collected from the medical records department of the hospital. Statistical analysis was done by using SPSS software. P value <0.05 was considered as significant.

3. Results

Hysteroscopy was performed in 100 infertile women, out of which 78% presented with primary infertility and 22% women were with secondary infertility. 46% women were of age < 30 years while 54% women were of age ≥ 30 years. All over mean age were 30.01 ± 5.48 years, amongst them, secondary infertility group were elder (31.1± 6.8 years) as compared to women with primary infertility (29.7±5.01 years), however difference was statistically insignificant (p value 0.326). Among 22 women with secondary infertility.

(Table 1) shows distribution of women undergoing hysteroscopy in primary and secondary infertility group. Normal intrauterine findings were found in 44 women. Majority of these women were of age less than 30 years (54.5%) and presented with primary infertility (79.5%). Abnormal Hysteroscopic findings were found in 56 women, of whom maximum women were with primary infertility (76.8%) and of age ≥30 years (60.7%)

Table 1: Distribution of hysteroscopic findings according to age and primary/secondary infertility.

Variables	Normal findings (n=44)	Abnormal findings (n=56)	P value
Primary infertility	35 (79.5%)	43 (76.8%)	0.741
Secondary infertility	9 (20.5%)	13 (23.2%)	
Age <30 years	24 (54.5%)	22 (39.3%)	0.129
Age ≥30years	20 (45.5%)	34 (60.7%)	

In primary infertility group, intrauterine pathologies were diagnosed in 43/78 (55.1%) women. The most common finding was intrauterine adhesions (41.8%) followed by endometrial polyp (25.5%), subseptate uterus (13.9%) and sub mucous myoma (11.6%).

In group with secondary infertility, abnormal intrauterine pathologies were detected in 13/22 women (59.1%).

Table 2: Abnormal intrauterine pathologies in women with primary infertility and women with secondary infertility

Intrauterine pathology	Primary infertility (n=78)	Secondary infertility (n=22)	P value
Cervical polyp	0 (0%)	1 (4.5%)	0.22
Cervical adhesions	1 (1.3%)	0 (0%)	1
Cervical cancer	1 (1.3%)	0(0%)	1
Intrauterine adhesions	18 (23.1%)	8 (36.3%)	0.758
a) Grade I	14 (17.5%)	3 (13.6%) 3 (13.6%) 2 (9.1%)	0.069
b) Grade II	2 (2.6%)		0.209
c) Grade III	2 (2.6%)		0.209
d)Polyp	1 (15.4%)	1 (4.5%)	0.287
e) Myoma	3 (3.84%)	0 (0%)	0.583
f) Subseptate uterus	6 (7.7%)	1 (4.5%)	0.22
Unicornuate uterus	0 (0%)	1 (4.5%)	0.22
Ostia fibrosis	2 (2.6%)	1 (4.5%)	0.53

The most common intrauterine pathology was intrauterine adhesions, seen in 36.4% women. Cervical adhesions was seen in 1% case only, seen in a women with primary infertility, with age < 30years. One case (1%) of endocervical growth was seen, who was 28-year-old woman with primary infertility, which was later diagnosed as cervical adenocarcinoma on histopathology report. Cervical polyp was found in 1% case, who was women with secondary infertility, with age <30 years. (Tab-2)

Intrauterine adhesions (IUA) were the most common intrauterine finding on hysteroscopy (26%). In primary infertility group 23.1% women were diagnosed with intrauterine adhesions while in women with secondary infertility, 36.4% women were found to have them. (Tab-2)

In most of the cases (65.4%), severity of adhesions were mild (grade I, obliteration of <1/3 of cavity, mostly singular and fundal adhesions). However, in 19.2% cases, grade II Asherman’s syndrome was found while another 15.4% cases, grade III Asherman’s syndrome i.e. more than 2/3rd of cavity was found to be obliterated. Endometrial polyp was the second most common finding on hysteroscopy, affecting 13% cases. In women with primary infertility,

15.4% women were found to have endometrial polyp, out of which in 83.3% cases single polyp was diagnosed on hysteroscopy, while in two polypes and three polypes were found in 16.66% cases. In secondary infertility group, 4.54% women were found to have single endometrial polyp on hysteroscopy. Polypectomy was done in all cases at same sitting and diagnosis was confirmed on histopathology.

Amongst müllerian anomalies, Septate uterus was the third most common abnormality detected on hysteroscopy, seen in 7% cases. In all of these cases, partial septum was diagnosed. Most of them were with primary infertility 85.7%, while only 14.3% were from secondary infertility group. Hysteroscopic septoplasty was done in all cases. One case of unicornuate uterus (1%) was found, seen in women with secondary infertility, which had history of one abortion and was of age 32 years. Submucous myomas found in only 3% of cases of primary infertility. Majority of the myomas were single and of type 0 and type 1. yomectomy was done and specimen was sent for histopathological diagnosis. Ostial fibrosis was detected in 3% of cases, out of which majority were from primary infertility group. As a complication only 1% case had perforation of uterus

occurred during resection of septum in women with primary infertility with subseptate uterus. It was managed conservatively and patient was well postoperatively.

4. Discussion

Evaluation of uterine cavity is one of the most important steps in the work up of infertile couple. Congenital and acquired disorders of uterine cavity can lead to impairment of endometrium and thus interfering in embryo implantation and growth of fetus [2]. Several investigations are available for evaluating the uterine cavity including TVS, HSG, SIS and hysteroscopy. Hysteroscopy is now days considered as most definite technique for evaluation of uterine cavity in infertility patients since it aids not only in diagnosing the pathology but also its simultaneous management [6].

The previously published data show large ranges of abnormal finding rates from one study to another (7.2% to 64%) [7, 15]. These differences could be explained by the hysteroscopic technique used, type of hysteroscopic distension medium, characteristics of the population including age of the population, ethnic factor, type of infertility (primary or secondary) and indications for hysteroscopy (infertility alone, hysterosalpingography abnormalities, prior to IVF). This proportion of abnormal uterine finding was found to be increased with age, ranging from 40% at age less than 30 years to 60% in women with age ≥ 30 years as seen in the present study. The results were comparable to study by Dicker D *et al* [7] who did a comparative study to determine role of hysteroscopy prior to in vitro fertilization-embryo transfer in elderly women. Hysteroscopy was done in 284 women, out of which uterine abnormalities was revealed in 29.9% of all patients and it was found that abnormal findings were significantly higher in the elderly women of age over 40 years in comparison to those of age less than 40 years ($P < 0.001$). No significant difference in the rate of uterine pathology was found between women with primary (76.8%) and secondary infertility (23.2%). Complication occurred in only one case (1%), case of 34-year-old woman with primary infertility, who was found to have incomplete septa on hysteroscopy. During resection of septum, perforation of uterine cavity occurred. The case was managed conservatively and patient was discharged on third day of surgery. No other complication was found during the study.

Intrauterine adhesions was the most commonest pathology in our study (46.4%). However, various studies has shown comparatively lower incidence of intrauterine adhesions ranging from 3-10% [16-18]. Endometrial polyp was diagnosed in 13 (21.8%) cases out of 56 cases of abnormal intrauterine pathology, of which no statistically significant difference was seen between primary and secondary infertility group. Shokeir TA *et al* [19] did a study to determine incidence of endometrial polyps on hysteroscopy in an infertile eumenorrhic population. Out of 244 women who underwent hysteroscopy, endometrial polyp was found in 36 (13.53%) patients.

Pregnancy outcomes dramatically improved after surgical correction. Currently, the advance modern operative hysteroscopic techniques have made it a relatively easy and brief day care procedure with low morbidity and prompt recovery. Therefore, hysteroscopy helps in not only diagnosing the septa but also its simultaneous resection.

Uterine myoma was found in 5/56 (9%) women in the current study. Donnez and Jadoul tried to address the issue

of whether myomas influence fertility, by reviewing 106 relevant articles [20]. They concluded that they do influence fertility, mainly based on the favourable pregnancy rates obtained after Myomectomy. Furthermore, they concluded that submucous and intramural myomas distort the cavity, impairing implantation and pregnancy rates in women undergoing IVF. Hence, Hysteroscopy not only diagnose these pathologies, but also enables Myomectomy at same siting [21].

5. Conclusion

This study shows hysteroscopy is a valuable diagnostic and therapeutic modality specially for infertile women as it provides cost-effective, comprehensive and a diagnostic aid and simultaneous therapeutic treatment in infertile patients. Hysteroscopy should be considered as routine investigation in evaluation of women with primary and secondary infertility.

6. References

1. Pundir J, El Toukhy T. Uterine cavity assessment prior to IVF. *Womens Health (Lond Engl)*. 2010; 6(6):841-848.
2. Brown SE, Coddington CC, Schnorr J, Toner JP, Gibbons W, *et al*. Evaluation of outpatient hysteroscopy, saline infusion hysterosonography and hysterosalpingography in infertile women: a prospective, randomized study. *Fertil Steril*. 2000; 74(5):1029-1034.
3. Maryam N, Hadieh H, Ahmadi F, Fatemeh N, Mohammad C. Diagnostic Accuracy of Transvaginal Sonography in the Detection of Uterine Abnormalities in Infertile Women. *Iran J Radiol*. 2012; 9(3):139-144.
4. Soares SR, Barbosa dos Reis MM, Camargos AF. Diagnostic accuracy of sonohysterography, transvaginal sonography, and hysterosalpingography in patients with uterine cavity diseases. *Fertil Steril*. 2000; 73(2):406-411.
5. Seshadri S, El-Toukhy T, Douiri A, Jayaprakasan K, Khalaf Y. Diagnostic accuracy of saline infusion sonography in the evaluation of uterine cavity abnormalities prior to assisted reproductive techniques: a systematic review and meta-analyses, 2015.
6. Practice committee of American Society for Reproductive Medicine. Diagnostic evaluation of the infertile female: a committee opinion. Birmingham, AL: American Society for Reproductive Medicine. *Fertil Steril*. 2015; 103(6):e44-e50.
7. Dicker D, Goldman JA, Ashkenazi J, Feldberg D, Dekel A. The value of hysteroscopy in elderly women prior to in vitro fertilization-embryo transfer (IVF- ET): a comparative study. *Journal of In Vitro Fertilization and Embryo Transfer*. 1990; 7(5):267-270.
8. Brusco GF, Arena S, Angelini A. The role of diagnostic hysteroscopy in infertile women. *Minerva Ginecologica*. 2001; 53(5):313-316.
9. Preuthippan S, Linasmita V. A prospective comparative study between hysterosalpingography and hysteroscopy in the detection of intrauterine pathology in patients with infertility. *Journal of Obstetrics and Gynaecology Research*. 2003; 29(1):33-37.
10. Pansky M, Feingold M, Sagi R, Herman A, Schneider D, *et al*. Diagnostic hysteroscopy as a primary tool in a basic infertility workup. *JSLs*. 2006; 10(2):231-235.

11. Taylor PJ, Lewinthal D, Leader A, Pattinson HA. A comparison of Dextran 70 with carbon dioxide as the distention medium for hysteroscopy in patients with infertility or requesting reversal of a prior tubal sterilization. *Fertility and Sterility*. 1987; 47(5):861-863.
12. Magos A, Al-Khoury A, Scott P, Taylor A, Sharma M, *et al*. One stop fertility clinic. *Journal of Obstetrics and Gynaecology*. 2005; 25(2):153-159.
13. La Sala GB, Montanari R, Dessanti L, Cigarini C, Sartori F. The role of diagnostic hysteroscopy and endometrial biopsy in assisted reproductive technologies. *Fertility and Sterility*. 1998; 70(2):378-380.
14. Shokeir TA, Shalan HM, El-Shafei MM. Combined diagnostic approach of laparoscopy and hysteroscopy in the evaluation of female infertility: results of 612 patients. *Journal of Obstetrics and Gynaecology Research*. 2004; 30(1):9-14.
15. Campo R, VanBelle Y, Rombauts L, Brosens I, Gordts S. Office mini-hysteroscopy. *Human Reproduction Update*. 1999; 5(1):73-81.
16. Martin K, Jean-Luc M, Chadi Y, Serge U, Jacky N. Office Hysteroscopy for Infertility: A Series of 557 Consecutive Cases. *Obstet Gynecol Int*, 2010, 168096.
17. Seyam EM, Hassan MM, Mohamed Sayed Gad MT, Mahmoud HS, Ibrahim G, *et al*. Pregnancy Outcome after Office Microhysteroscopy in Women with Unexplained Infertility. *Int J Fertil Steril*. 2015; 9(2):168-175.
18. Oliveira FG, Abdelmassih VG, Diamond MP, Dozortsev D, Nagy ZP, *et al*. Uterine cavity findings and hysteroscopic interventions in patients undergoing in vitro fertilization-embryo transfer who repeatedly cannot conceive. *Fertil Steril*. 2003; 80(6):1371-1375.
19. Shokeir TA, Shalan H, El-Shafei. Significance of endometrial polyps detected hysteroscopically in eumenorrhic infertile women. *J Obstet Gynaecol Res*. 2004; 30(2):84-89.
20. Grimbizis GF, Camus M, Tarlatzis BS, Bontis JN, Devroey P. Clinical implications of uterine malformations and hysteroscopic treatment results. *Hum Reprod*. 2001; 7(2):161-174.
21. Nagele F, O'Connor H, Davies A, Badawy A, Mohamed H, *et al*. 2500 outpatient diagnostic hysteroscopies. *Obstet Gynecol*. 1996; 88(1):87-92.