

ORIGINAL RESEARCH**Abnormal Hysteroscopic Findings in Patients with Infertility**

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ABSTRACT

Background: To describe the hysteroscopy findings in a group of 504 infertile women and correlate the findings available with other diagnostic modalities mainly HSG.

Martial and Methods: After obtaining the consent, the hysteroscopic procedures were carried out in the proliferative phase of the menstrual cycle. Size and position of the uterus was confirmed by bimanual examination. Any abnormality of uterine cavity, endometrium, and uterine ostia were noted and corrective measures were taken accordingly in the same setting. Post procedure follow-up of these patients were done and pregnancy outcomes were noted.

Results: The normal hysteroscopy findings were reported in 223 women (73.84%). Remaining 79(26.16%) had abnormal findings, most commonly being endometrial polyps (32%) and intrauterine adhesions (29%) and rest were septum, T-shaped uterus, chronic tubercular endometritis, and sub mucosal fibroids.

Conclusion: We concluded that HSG can detect uterine abnormalities, but findings have to be confirmed by hysteroscopy. Hysteroscopy should be performed in all infertile women with abnormal HSG and those who fail to conceive after normal HSG findings as incidental lesions can be missed on HSG.

Keywords: Transvaginal Ultrasonography (USG), Hysterosalpingography (HSG), Hysteroscopy.

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INTRODUCTION

Infertility is defined as failure of a couple to conceive for at least 1 year after regular and unprotected intercourse. Infertility can be primary and secondary. Tubo-peritoneal pathology is responsible for infertility in 30 to 40% of the cases, whereas uterine pathology accounts for 15% of cases. Other factors include ovulatory dysfunction (20–40%). In 20 to 40% cases, infertility is due to male factor. Most endometrial pathologies implicated in infertility result from both structural and functional impairments.^[1] Therefore, assessment of endometrial cavity should be included in the evaluation of infertile couples. This can be done through transvaginal ultrasonography (USG), hysterosalpingography (HSG) and hysteroscopy.^[2,3] Hysteroscopy is performed for evaluation or treatment of different pathologies of the

endometrial cavity, tubal ostia, or endocervical canal for diagnosis alone or for diagnostic and therapeutic purpose in the same operative time.^[4] Though pelvic sonography and HSG are good enough for excluding gross intrauterine pathology, subtle changes in the form of small polyps, adhesions, and sub endometrial fibroid seedling, which influences fertility, can be missed. These subtle changes are better picked up on magnification with hysteroscopy. Hysteroscopic examination is probably superior to HSG in evaluating the endometrial cavity.^[4] Furthermore, abnormal hysteroscopic findings have been reported in patients with normal HSG,^[5] or transvaginal ultrasonography.^[6] Bettocchi introduced the 'no-touch' transvaginal approach, where no instruments expose or grasp the cervix. However, the World Health Organization (WHO) recommends hysterosalpingography (HSG), alone, for management of infertile women probably because of its ability to provide information regarding tubal patency also.^[7] Nevertheless, hysteroscopy is a more accurate tool because of the high false-positive and false negative rates of intrauterine abnormality with HSG.^[8,4,5] Hysteroscopy could also be seen as a positive prognostic factor for achieving pregnancy in women with a history of recurrent implantation failure.^[9] The aim of this retrospective study is to describe the hysteroscopy findings in a group of 504 infertile women and correlate the findings available with other diagnostic modalities.

MATERIALS & METHODS

- The study was done retrospectively by analyzing data of 504 infertile women who presented to our OPD in a small municipal hospital in Mumbai from November 2012 to March 2017.
- All women who were enrolled in the infertility clinic had undergone detailed history taking, physical examination, base line blood investigations on the first visit.
- Out of these 504 patients, in 157 patients, other causes of infertility (except uterine causes) were found and 45 patients had lost to follow up for further evaluation of infertility.
- Out of 504 infertile women, only 302(62%) underwent hysteroscopy. In the remaining, other causes of infertility (except uterine causes) was found. Hysterosalpingography was available in 214 patients only.
- After obtaining the consent, the hysteroscopic procedures were carried out in the proliferative phase of the menstrual cycle, in spinal anesthesia, in lithotomy position all done by the same person. Size and position of the uterus was confirmed by bimanual examination.
- The vaginoscopy, or "no touch," technique was performed without a speculum or tenaculum. The hysteroscope was connected to the source of distending medium and introduced into endocervical canal and uterine cavity after ensuring that there were no air bubbles in the distending fluid. Normal saline was used as distending media for diagnostic procedure. The endocervical and uterine lining was studied and both tubal ostia were identified.
- The criteria taken for normal hysteroscopy were normal uterine cavity (regular in shape and contour, no fibroid/mass/polyp), normal endometrium, and normal bilateral ostia. Any abnormality of uterine cavity, endometrium, and uterine ostia were noted and corrective measures were taken accordingly in the same setting, as only operative scissors were available at our institute. Post procedure follow-up of these patients were done and pregnancy outcomes were noted.

RESULTS**Table 1: Duration of Infertility**

| Duration (in years) | No. of women | Percentage |
|---------------------|--------------|------------|
| 1-2 years | 168 | 55.6% |
| 2-5 years | 105 | 32.8% |
| >5 years | 29 | 9.6% |

Table 2: Types of Infertility

| | No. of women | Percentage |
|-----------------------|--------------|------------|
| Primary infertility | 193 | 63% |
| Secondary infertility | 109 | 37% |
| Previous live birth* | 14 | 17% |
| 1 abortion* | 53 | 67% |
| ≥2 abortions* | 24 | 30% |

Table 3: Hysteroscopic Findings

| | No. of women | Percentage |
|-------------------------|--------------|------------|
| Normal findings | 223 | 73.84% |
| Cervical abnormalities* | 2 | 2% |
| Endometrial polyps* | 25 | 32% |
| Adhesions* | 22 | 29% |
| Intrauterine septum* | 9 | 11% |
| Submucous myoma* | 4 | 5% |
| Chronic endometritis* | 12 | 17% |
| T shaped uterus* | 5 | 6% |

Table 4: Hysteroscopic Findings with Pre-Hysteroscopy Diagnosis

| Positive findings (in USG and HSG) | Similar findings in hysteroscopy | Dissimilar findings in hysteroscopy |
|------------------------------------|----------------------------------|-------------------------------------|
| Positive | 87 | 32 |
| Negative | 128 | 24 |

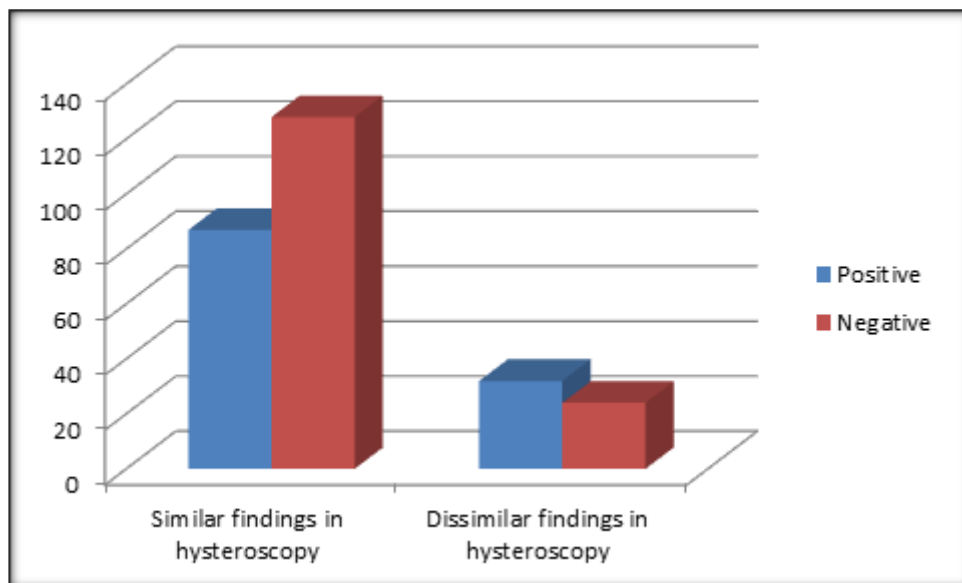


Table 4: Interventions Performed in the Study Population

| | No. | Procedure |
|------------------------|------------|------------------|
| Cervical abnormalities | 2 | Dilatation |
| Endometrial polyps | 25 | Polypectomy |
| Adhesions | 22 | Adhesiolysis |
| Intrauterine septum | 9 | Septum resection |
| Chronic endometritis | 12 | Curettage |

Among the patients who underwent hysteroscopy, the mean age of population presenting with infertility was between 25-40 years of age. The duration of infertility ranged from 1-7 years. There were 193 (63%) women with primary infertility, and 109 (37%) women with secondary infertility. In 152 patients who had normal investigations prior to hysteroscopy, revealed uterine abnormalities in 24(16%) and those with abnormal findings, hysteroscopy was normal in 32(14%) patients.

Most of the procedures took only 15-20 minutes to be performed, while only septal resection and adhesiolysis of dense adhesions took around 30 minutes. The normal hysteroscopy findings were reported in 223 women (73.84%). Remaining 79(26.16%) had abnormal findings, most commonly being endometrial polyps (32%) and intrauterine adhesions (29%) and rest were septum, T-shaped uterus, chronic tubercular endometritis, and sub mucosal fibroids. Only scissors were used, therefore, polyps, septum and Asherman were managed in small municipal hospital and sub mucosal fibroids were send to tertiary care institutes.

Statistical Analysis

The collected data was summarized by using frequency, percentage, mean & S.D. To compare the qualitative outcome measures Chi-square test or Fisher's exact test was used. To compare the quantitative outcome measures independent t test was used. If data was not following normal distribution, Mann Whitney U test was used. SPSS version 22 software was used to analyze the collected data. p value of <0.05 was considered to be statistically significant.

DISCUSSION

Uterine cavity abnormalities are commonly encountered in the infertile population; therefore, an accurate, cost effective, safe and easy method is needed in the first-line evaluation of an infertile couple.

Hysteroscopy easily performed in a few minutes, provides direct visualization of the cervical canal and uterine cavity, but not the tubes and an opportunity to intervene in the diagnosed pathology without remarkable patient discomfort. Moreover, endometrial disorders that are inflammatory or infectious in etiology or its hormonal and tropic status can be visualized in hysteroscopy. As compared to patients with primary infertility, hysteroscopic abnormalities were more commonly seen in patients presenting with secondary infertility. This may be due to interventions which were conducted during previous pregnancies like dilatation and curettage and previous cesarean section, and henceforth, more chances of having intrauterine adhesions.

On the other hand, endometrial polyps were the most common hysteroscopic abnormal finding seen in patients presenting with primary infertility. Unfortunately, pre-hysteroscopic ultrasound or HSG finding results were not available in all our patients. Pre-hysteroscopic diagnosis was available only for 214 patients by HSG and for 276 patients, USG was available. The results of this study showed that among 152 women who had normal HSG and ultrasonography, 24 women had abnormal findings on hysteroscopy, for a negative predictive value 85.3% (95% CI: 78.43–90.67%) for both ultrasound and HSG. On the other hand, in

patients with normal investigations, 32 women were found to have some abnormality during hysteroscopy, for a positive predictive value of 67.19% for both ultrasound and HSG (95% CI: 54.31–78.41%).

One study reported that two thirds of hysteroscopic findings were not correlated with those found on HSG. It was shown that 54.3% of intrauterine adhesions diagnosed on HSG were not found on direct hysteroscopy examination. In another study, a false negative rate of 35.4% was reported for diagnostic value of HSG when compared to hysteroscopy in female infertility. HSG may be associated with both false positive and false negative results due to difficult distention of the uterine cavity, blood, debris, mucus, or air bubbles. Although TVUS is widely available and minimally invasive, it sometimes, misses focal lesions. Endocervical lesions and subtle lesions in the tubal ostia and cornual region are easily missed with TVUS.^[5,10]

Koskas M et al suggested office hysteroscopy for infertility in their series of 557 consecutive cases. Rates of abnormal findings in unselected infertile patient who underwent diagnostic hysteroscopy ranged from 30% at 30 years to more than 60% after 42 years. Risk of abnormal finding was multiplied by a factor of 1.5 every 5 years. Our data are an additional argument to propose office hysteroscopy as part of first line exams in infertile woman, regardless of age.^[6]

Vaginal ultrasound has a sensitivity of 85% and a specificity of 84%, compared to hysteroscopy, which has a sensitivity of 99% and specificity of 95%. In spite of this, the place of routine hysteroscopy in management of infertile women with or without diagnosis of intra-uterine pathology is debatable. This is because of invasive nature of hysteroscopy and the controversy about the real impacts of these disorders on fertility. An increase in pregnancy rates after performing necessary intervention might be attributed to the removal of uterine pathology at the time of hysteroscopy which, in turn, resulted in improved implantation in this population at risk. However, those pregnancies developed after hysteroscopic confirmation of absence of any intrauterine pathology. The irrigation of the cavity with saline may also have a beneficial effect on implantation and pregnancy rates in infertile women.^[10-13]

Hucke J et al in their study elaborated that diagnostic hysteroscopy should be included routinely in the work-up of invasive examinations for infertility patients. In infertile patients about 20% of hysteroscopic examinations show some grade of intrauterine abnormalities. Congenital uterine malformations are the most frequently found disorders. In the group of patients with habitual abortions abnormalities are found much more often and can also be more often interpreted as the mainly underlying factor for the repeated abortions. Operative hysteroscopy has become the surgical method of first choice for the treatment of uterine septa, submucous myomas, polyps and synechia. After septum dissection results are excellent. Myoma removal also shows beneficial effects on fertility; nevertheless, cases are not too frequent among infertility patients. In cases of high-grade Asherman's syndrome, the prognosis after hysteroscopic surgery is still often poor.^[14]

Fayez JA et al studied the diagnostic value of hysterosalpingography and hysteroscopy in infertility investigation. It was found that hysterosalpingography was as accurate as hysteroscopy in the diagnosis of normal or abnormal uterine cavities while the nature of the intrauterine filling defects was accurately revealed by hysteroscopy only. They concluded that hysterosalpingography is an important screening procedure for the diagnosis of normal or abnormal uterine cavities and that hysteroscopy should be reserved only for the confirmation and treatment of intrauterine anomalies discovered by hysterosalpingography. Therefore, we look at the two procedures, hysterosalpingography and hysteroscopy, as complementary techniques.^[15]

Comparison of hysterosalpingography and hysteroscopy in female infertility was also done by Wang CW et al. Although some abnormalities were identified by both methods in 114 women, findings of both procedures were similar in only 88 (77.2%). In 75 (35.0%), the findings of HSG differed from those of hysteroscopy. In only 139 (65%) patients were the findings (normal and abnormal) similar for both methods. We advocate hysteroscopy in the investigation of female infertility for its accuracy, safety, simplicity, and convenience.^[16]

CONCLUSION

From our study, we concluded that HSG can detect uterine abnormalities, but findings have to be confirmed by hysteroscopy. Hysteroscopy should be performed in all infertile women with abnormal HSG and those who fail to conceive after normal HSG findings as incidental lesions can be missed on HSG.

REFERENCES

1. Alatas C, Aksoy E, Akarsu C. Evaluation of intrauterine abnormalities in infertile patients by sonohysterography. *HumReprod* 1997;12(3):487–90.
2. Ayida G, Chamberlain P, Barlow D, Kennedy S. Uterine cavity assessment prior to in vitro fertilization: comparison of transvaginal scanning, saline contrast hysterosonography and hysteroscopy. *Ultrasound Obstet Gynecol* 1997;10(1):59–62.
3. Oliveira FG, Abdelmassih VG, Diamond MP, Dozortsev D, Nagy ZP, Abdelmassih R. Uterine cavity findings and hysteroscopic interventions in patients undergoing in vitro fertilization-embryo transfer who repeatedly cannot conceive. *Fertil Steril* 2003;80(6):1371–5.
4. Koskas M, Mergui JL, Yazbeck C, et al. Office hysteroscopy for infertility: a series of 557 consecutive cases. *Obstet Gynecol Int* 2010;168096–168096..
5. Golan A, Eilat E, Ron-El R. Hysteroscopy is superior to hysterosalpingography in infertility investigation. *Acta Obstet Gynecol Scand* 1996;75(7):654–6.
6. Rowe PC, Hargreave T, Mellows H. WHO manual for the standardized investigation and diagnosis of the infertile couple. Cambridge, UK: The Press Syndicate of the University of Cambridge; 1993.
7. Prevedourakis C, Loutradis D, Kalianidis C, Markis N, Asavan-tinos D. Hysterosalpingography and hysteroscopy in female infertility. *Hum Reprod* 1994;9:2353–5.
8. Cenksoy P, Ficicioglu C, Yildirim G, Yesiladali M. Hysteroscopic findings in women with recurrent IVF failures and the effect of correction of hysteroscopic findings on subsequent pregnancy rates. *Arch Gynecol Obstet* 2013;287(2):357–60 [Feb].
9. Kessler I, Lancet M. Hysterography and hysteroscopy. A comparison. *Fertil Steril* 1986;46(4):709–10.
10. Breitkopf D, Frederickson RA, Snyder RR. Detection of benign endometrial masses by endometrial stripe measurement in pre-menopausal women. *Obstet Gynecol* 2005;104(1):120–5.
11. Van Dongen H, De Kroon CD, Jacobi CE, Trimbos JB, Jansen FW. Diagnostic hysteroscopy in abnormal uterine bleeding: a systematic review and meta-analysis. *BJOG*. 2007;114(6):664–675.
12. Demiroglu A, Gurgan T. Effect of treatment of intrauterine pathologies with office hysteroscopy in patients with recurrent IVF failure. *Reprod Biomed Online*. 2004;8(5):590–594.
13. Lorusso F, Ceci O, Bettocchi S, Lamanna G, Constantino A, Serrati G, Depalo R. Office hysteroscopy in an in vitro fertilization program. *Gynecol Endocrinol*. 2008;24(8):465–469.

14. Hucke J, De Bruyne F, Balan P. Hysteroscopy in infertility--diagnosis and treatment including falloposcopy. *Contributions to Gynecology and Obstetrics*. 2000 Jan 1;20:13-20.
15. Fayez JA, Mutie G, Schneider PJ. The diagnostic value of hysterosalpingography and hysteroscopy in infertility investigation. *American journal of obstetrics and gynecology*. 1987 Mar 1;156(3):558-60.
16. Wang CW, Lee CL, Lai YM, Tsai CC, Chang MY, Soong YK. Comparison of hysterosalpingography and hysteroscopy in female infertility. *The Journal of the American Association of Gynecologic Laparoscopists*. 1996 Aug 1;3(4):581-4.