

Hysteroscopic Evaluation of Endometrial Cavity in Infertility - A Descriptive Study

*Sangeeta Shah, Syeda Zeenat Kousar¹, Madhulatha Alexander², P.Devi Anusha³

*Professor, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.

1. Senior Resident, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.

2. Associate Professor, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.

3. Postgraduate, Department of Obstetrics and Gynaecology, Gandhi Medical College, Secunderabad, Telangana.

*Corresponding Author:- Dr.Sangeeta Shah, Professor of Obstetrics & Gynaecology, Gandhi Medical College/Hospital, Secunderabad, Telangana State

Abstract:

Background: Uterine abnormalities, congenital or acquired, are implicated as one of the causes of infertility. Hence a complete infertility workup should include an evaluation of uterine cavity. The role of hysteroscopy in infertility investigation is to detect possible intrauterine changes that could interfere with implantation or growth, or both of the conceptus.

Objective: To identify and to study the incidence of endometrial pathology in infertility and to identify patients with infertility having uterine anomaly for further management.

Methods:

The study was conducted in Gandhi hospital from November 2017 to April 2019. Hysteroscopic evaluation of endometrial cavity was performed in 50 patients attending the infertility clinic.

Results:

USG showed abnormality in 20% of the subjects. HSG showed abnormality in 28% of subjects of which 6% were false positives. Hysteroscopy showed abnormality in 40% of the infertility subjects of which 14 % had congenital abnormalities and 26% had acquired abnormalities.

Conclusion:

Hysteroscopy is a valuable, simple, safe, feasible, highly tolerable, sensitive, specific, low risk and minimally invasive method which allows an adequate exploration of the uterine cavity under vision and it also provides information about the cervical canal.

Key Words: Hysteroscopy, Infertility, Endometrium

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I. Introduction:

Pathologies within the uterine cavity are the cause of infertility in as many as 15% of couples seeking treatment and are diagnosed in greater than 50% of infertile patients. Therefore, the evaluation of the couple with infertility should consistently include an assessment of the endometrial cavity. Hysteroscopy is considered the gold standard for uterine cavity evaluation because it allows for direct visualization. It can detect fibroids, endometrial polyps, Ashermans syndrome, foreign bodies, uterine anomalies like septate uterus, bicornuate uterus, arcuate uterus, unicornuate uterus contributing to infertility. It also helps in detecting abnormalities of cervix like cervical stenosis or polyps and aids in the visualization of tubal ostia thereby detecting lesions of uterotubal junction. In addition, hysteroscopic approach offers the possibility of obtaining endometrial biopsies under visual control.

II. Aims And Objectives

- To identify and to study the incidence of endometrial pathology in infertility
- To identify patients with infertility having uterine anomaly for further management.

III. Materials And Methods

The study was conducted in Gandhi hospital from November 2017 to April 2019 after obtaining approval of the Institutional Ethics committee. Hysteroscopic evaluation of endometrial cavity was performed in 50 patients attending the infertility clinic after explaining them the protocol of the study and obtaining an informed consent in a pre-designed proforma.

SAMPLE SIZE: 50

STUDY DESIGN: Descriptive study

INCLUSION CRITERIA:

- a. Women with primary infertility.
- b. Women with secondary infertility.
- c. Women with recurrent pregnancy loss.
- d. Women with previous preterm deliveries.

EXCLUSION CRITERIA:

- a. Couples with male factor infertility.
- b. Women with active cervico vaginal infection.
- c. Women with acute PID.
- d. Women with proven genital tuberculosis.
- e. Women with ovarian factor infertility on sonography and hormonal profile abnormality.
- f. Women with tubal factor infertility on ultrasound or HSG.

IV. Methodology:

All the women attending gynaecology OPD for infertility were counselled regarding the possible causes for their infertility. They were subjected to detailed relevant history taking followed by physical examination, thyroid examination, and breast examination, abdominal examination, per speculum and per vaginal examination. The Male partner's semen analysis was carried to rule out male factor infertility according to WHO criteria for normal male semen analysis.

The women were subjected to the baseline investigations including CBC, blood group, VDRL, HIV, HbsAg, LFT, KFT, blood sugar, serum electrolytes, urine analysis was done. Chest x ray and Mantoux tests were done. Serum progesterone (mid luteal progesterone on day 21 of 28 day cycle or 1 week before expected period), FSH and LH on day 3, AMH levels, Thyroid profile and Prolactin levels were also obtained to exclude endocrinological and ovarian causes of infertility.

The patients with normal hormonal profile were subjected to evaluation of uterine cavity by ultrasonography which was done in the post menstrual period. The patients in whom adnexa was found to be normal on scan were subjected to further evaluation of uterine cavity by hysterosalpingography and hysteroscopy. The patients in whom HSG showed bilateral peritoneal spill (no tubal factor infertility) were selected for further evaluation of uterine cavity by hysteroscopy.

All the selected patients were admitted 1 day prior to surgery after investigations.

Preanaesthetic evaluation was carried out in the evening and preparation of the patient for hysteroscopy was done. Prophylactic antibiotic was given a night before and at the time of induction.

Diagnostic hysteroscopy was carried out after obtaining written informed consent from the patients. The initial step at hysteroscopy was to identify the uterine cavity and the ostia and to evaluate the right and left cornua, fundus, anterior and posterior walls and lateral walls for specific lesions, as well as to evaluate the overall contour of the uterine cavity. A biopsy was taken and sent for HPE and CB NAAT.

STATISTICAL ANALYSIS:

The data was tabulated in Excel 2013 and analysed using SPSS software version 16. Quantitative and qualitative variables were expressed in terms of descriptive statistics. Each data variable was correlated with other variables using non parametric statistic i.e. chi square analysis and Fischer's exact test. Sensitivity, specificity, positive predictive value, negative predictive value, P value and Kappa value were calculated. P value < 0.05 is considered as statistically significant in this study. Kappa value 0.0 to 0.20 is considered as slight degree of agreement, 0.21 to 0.40 is fair degree of agreement, 0.41 to 0.60 is moderate degree of agreement, 0.61 to 0.80 is considered substantial.

V. Results:

AGE DISTRIBUTION:

In the present study, 13 (26%) of subjects were between age 21-24 years, 18(36%) were between the ages of 25-28 years, 12 (24%) between age 29-32 years, 6 (12%) between age 33-35 years and 1 (2%) was older than 36 years of age.

TYPE OF INFERTILITY SUBJECTS:

In present study, 35 cases (70%) had primary infertility and 15 cases(30%) had secondary infertility.

BODY MASS INDEX DISTRIBUTION:

In present study, 44% of subjects had normal BMI, 36% were overweight and 20% were obese.

DURATION OF MENSTRUAL CYCLE:

In present study, 62% of subjects had menstrual cycles ranging between 21-35 days and the menstrual flow was 3-5 days in 62% of cases.

OTHER RELEVANT HISTORY:

In present study, 60% of secondary infertile women had history of previous abortions.

Out of 9 cases with history of previous abortions, 7(77.78%) cases had history of check curettage.

In the present study, 26 subjects had endometrial thickness of less than or equal to 5 mm and 24 subjects had endometrial thickness of more than 5 mm.

Ultrasound showed normal findings in uterine cavity in 80%, endometrial polyp in 6%, fibroid was seen in 6%, septate/sub septum in 6% and unicornuate uterus was seen in 2% of infertile patients.

Abnormal findings were seen on ultrasound in 20% of women with primary infertility and 20% of women with secondary infertility.

HSG showed normal findings in 72% and abnormal findings in 28% of women with infertility. The most common abnormality detected was homogenous filling defect which indicates either a polyp or a fibroid and it was seen in 16% of subjects, irregular filling defect which indicates intrauterine synechiae were seen in 2%, unicornuate uterus was seen in 2% and septate/ sub septum was seen in 8% of infertile subjects.

HSG showed abnormal findings in 25.71% of women with primary infertility and 33.33% of women with secondary infertility. The most common abnormality in both primary and secondary infertility subjects was homogenous filling defect, it was seen in 14.29% of women with primary infertility and 20% of women with secondary infertility.

TABLE 1: HYSTEROSCOPY FINDINGS:

HYSTEROSCOPY FINDINGS	Number(N=50)	Percentage
Normal uterine cavity	30	60
Congenital abnormality	7	14
Acquired abnormality	13	26
TOTAL	50	100

In present study, hysteroscopy showed normal uterine cavity in 60%, congenital abnormality was seen in 14% and acquired abnormality was seen in 26% of women with infertility.

Congenital abnormalities were seen in 11.43% of women with primary infertility and 20% of women with secondary infertility, acquired abnormalities were seen in 25.71% of women with primary infertility and 27% of women with secondary infertility.

TABLE 2: HYSTEROSCOPY FINDINGS IN INFERTILITY:

Hysteroscopy findings	Number(N=50)	Percentage
Normal cavity	30	60
Septate uterus	3	6
Subseptate uterus	3	6
Unicornuate uterus	1	2
Endometrial polyp	5	10

Fibroid	4	8
Atrophic endometrium	1	2
Synechiae	2	4
Tubercles on endometrium	1	2
Total	50	100

Hysteroscopy showed normal uterine cavity in 60% of infertile women. The most common abnormality was endometrial polyp(10%), followed by fibroid(8%), septate uterus(6%), subseptate(6%) and uterine synechiae (4%).

TABLE 3: COMPARISON BETWEEN ULTRASOUND, HYSTEROSALPINGOGRAPHY, HYSTEROSCOPY FINDINGS:

	USG	HSG	Hysteroscopy
Normal cavity	40(80%)	36(72%)	30(60%)
Abnormal findings	10(20%)	14(28%)	20(40%)

Ultrasound showed abnormal findings in 20%, Hysterosalpingography showed abnormal findings in 28% and hysteroscopy showed abnormal findings in 40% of women with infertility.

TABLE 4: COMPARISON OF EVALUATION BY ULTRASOUND AND HYSTEROSCOPY:

	Hysteroscopy		
Ultrasound	Positive	Negative	Total
Positive	10(20%)	0	10(20%)
Negative	10(20%)	30(60%)	40(80%)
Total	20(40%)	30(60%)	50(100%)

Sensitivity: 50%

Specificity: 100%

Positive predictive value: 100%

Negative predictive value: 75%

Area under the curve: 0.25 with, Kappa value: 0.54 (p value <0.05*)

Moderate degree of agreement was found between the two investigations

TABLE 5: COMPARISON OF EVALUATION BY HYSTEROSALPINGOGRAPHY AND HYSTEROSCOPY:

	Hysteroscopy		
HSG	POSITIVE	NEGATIVE	Total
POSITIVE	11(22%)	3(6%)	14(28%)
NEGATIVE	9(18%)	27(54%)	36(72%)

Total	20(40%)	30(60%)	50(100%)

Sensitivity: 55%

Specificity: 90%

Positive predictive value: 78.57%

Negative predictive value: 75%

Area under the curve : 0.275 with kappa value : 0.47 (p value <0.05*)

Moderate degree of agreement was found between the two investigations.

Most common false positive diagnosis on HSG was a homogenous filling defect(fibroid/polyp) which may be attributed to air bubble, mucus or clots in the cavity.

VI. Discussion:

In the present study, incidence of primary infertility was 70% and that of secondary infertility was 30.

Majority of primary infertile women belonged to the age group of 21 – 28 years (68.67%) and that of secondary infertile women to the age group of 25 - 32 years (80%). Study conducted by Sharma et al(1), showed 62.2% of primary infertility patients belonged to age group of 21-25 years, 47.2% of secondary infertility patients belonged to age group of 26-30 years.

In present study, 22% had duration of cycle less than 21 days and 16% had duration of cycle more than 35 days. Short menstrual cycle lengths are associated with reduced fertility, according to a new study led by Boston University School of Public Health researchers(2). They found that women who had cycles of less than 26 days had reduced chances of fertility.

ULTRASOUND FINDINGS IN PRESENT STUDY AND OTHER STUDIES:

In the present study, scan showed abnormalities in 20% cases.

In a study by Padma Shukla, et al(3), scan showed abnormalities in 35% cases.

In present study, 8% had a congenital abnormality on ultrasound.

In a study conducted by Liana Ples, et al.(4) 12.27% were diagnosed with Mullerian duct anomalies.

In the present study, uterine septum/subseptum was seen in 12% of cases. In a study by Kupesic S, et al.(5) uterine septum was the most common uterine abnormality seen by ultrasound in 17.9% of infertile women.

COMPARISON OF SENSITIVITY AND SPECIFICITY OF ULTRASOUND IN VARIOUS STUDIES:

In the present study, the sensitivity of USG was found to be 50% which is comparable to studies by El Mazny A, et al(6)-41.7%, Padma Shukla, et al(3)-51.21% & Apirakviriya C, et al(7)-68.2%. The specificity of USG in diagnosing anomalies in the present study was 100% which is comparable to other studies as well. El Mazny A, et al(6)-100%, Padma Shukla, et al(3)-100% & Apirakviriya C, et al(7)- 91.5%.

HSG FINDINGS IN PRESENT STUDY AND OTHER STUDIES:

In present study HSG showed abnormal findings in 28% of women with infertility and normal in 72%. In a study by Padma Shukla, et al(3) HSG showed abnormalities in 35% cases. In a study by Leena Wadhwa, et al(8), HSG showed normal uterine cavity 77.8% women and abnormal in 22.85%.

COMPARISON OF SENSITIVITY, SPECIFICITY, POSITIVE PREDICTIVE VALUE AND NEGATIVE PREDICTIVE VALUE OF HSG IN VARIOUS STUDIES:

The sensitivity of HSG in diagnostic evaluation of infertility in the present study was 55%, and in other studies by Elif Aylin Takin, et al.(9) was 21.6%, by Padma Shukla et al(3) it was 90%. The specificity in this study was found to be 90%, which is comparable to other studies by Elif Aylin Takin et al.(9) in which it was 83.7%, & by Padma Shukla et al(3) where it was 100%. The positive predictive value in our study was 78.5%, and in the studies by the same researchers it was 55.2% and 100% respectively. The negative predictive value in our study is 75% as compared to other studies by the same authors where it was 55.2% and 100% respectively.

COMPARISON OF HYSTEROSCOPY FINDINGS IN PRESENT STUDY AND OTHER STUDIES:

In present study, hysteroscopy showed normal uterine cavity in 60% and abnormalities in 40% similar to the study by Koskas et al.(10) which showed abnormal findings in 40% of infertile women. In the study by Padma Shukla et al.(3) and another study by Ahmed et al.(11), abnormal findings were found in 65% and 20.3% respectively.

In the present study, 14% had congenital abnormality and 26% had acquired abnormality. 37.14% of women with primary infertility had intrauterine abnormality. 47% of women with secondary infertility had intrauterine pathology of which 20% had congenital abnormality and 27% had acquired abnormality.

In a study by Vidya Bhat, et al(12) 26% of women with primary infertility had intrauterine pathology of which 14% had acquired findings & 12% had congenital malformations.31% of women with secondary infertility had abnormalities of which 20% had acquired and 11% had congenital abnormalities.

In the present study the most common finding on hysteroscopy was endometrial polyp seen in 10% of cases similar to a study conducted by Apirakviriya C, et al.(7) and Bakas P et al.(13)

In present study, the most common congenital abnormality were septate and subseptate uteri together contributing to 12%. The most common acquired abnormality was endometrial polyp contributing to 10%.

In present study the most common acquired abnormalities seen on hysteroscopy in primary infertility were endometrial polyp and fibroid. Endometrial polyp was the most common in women with secondary infertility.

In a study by Vidya Bhat, et al.(12) endometrial polyp followed by submucous fibroid was the most common acquired intrauterine abnormality in the primary infertility group whereas submucous fibroids was the most common reason for intrauterine abnormality in secondary infertility group.

In our study, 4% of infertility subjects were found to be positive for tuberculosis infection. In the study by Savita S. et al(14). 10% of the population was found to be positive for tuberculosis infection

SUMMARY:

In our study, 70% cases had primary infertility and 30% had secondary infertility.

44% of the subjects had normal BMI.

62% of subjects had menstrual cycles ranging between 21-35 days.

60% of subjects with secondary infertility had history of previous abortions.

52% had ET of \leq 5 mm.

USG showed abnormality in 20% of the subjects.

HSG showed abnormality in 28% of subjects of which 6% were false positives.

Hysteroscopy showed abnormality in 40% of the infertility subjects of which 14 % had congenital abnormalities and 26% had acquired abnormalities.

The most common abnormality was endometrial polyp

Drawback of the study: Endometrial biopsy generally done in premenstrual phase is more accurate in diagnosing hyperplasias or TB endometritis. In our study as hysteroscopy was done in follicular phase, biopsy was also taken in the same phase.

VII. Conclusion:

Hysteroscopy is a valuable, simple, safe, feasible, highly tolerable, sensitive, specific, low risk and minimally invasive method which allows an adequate exploration of the uterine cavity under vision and it also provides information about the cervical canal.

In patients with infertility, hysteroscopy provides the possibility of immediate diagnosis, prompt and effective treatment. The safety, ease of proficiency and ease of diagnosis, with diagnostic hysteroscopy has taken over much of a guess work out of clinical diagnosis. It is an excellent tool in diagnosis of Asherman's syndrome, Submucous fibroids, endometrial hyperplasia and chronic endometritis. It is a very helpful technique in patients with foreign bodies, since it can detect their presence, extension and nature, and these can also be removed under visual control with hysteroscope only.

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