ROLE OF HYSTEROSCOPIC IN EVALUATION OF FEMALE INFERTILITY

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ABSTRACT

BACKGROUND

The causative agent for female infertility are often multifactorial. The role of hysteroscopy in current practice is an essential modality to direct visualise the different intrauterine abnormalities. Moreover, it allows both the diagnostic and therapeutic procedure at the same sitting.

MATERIALS AND METHODS

This is a prospective and descriptive study; 50 infertile women either primary or secondary was recruited for hysteroscopic evaluation. Study was done in Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha, from July 2015 to June 2016. Hysteroscopy was performed in early follicular phase (6 to 10 day) using 3.9 mm continuous-flow operative hysteroscopy based on rod lens scope with short general anaesthesia. The uterine cavity was distended by normal saline solution and intrauterine pressure was controlled by an irrigation device. Intrauterine pressure was set around 30 mmHg resulting in a balance irrigation flow of around 200 mL/minute and vacuum of 0.1 bar endometrial specimens were obtained. Specimen were collected in formalin solution and sent for histopathological examination.

RESULTS

In our study, most of the patients (50%) were married for (1-3) years and (24%) were in the group of (4-7) years married life. In our study, 4% of the patients had normal uterine cavity, but majority of the patients 96% had abnormal hysteroscopic findings comprising endometrial hyperplasia 19.79%, endometrial polyp 9.38%, submucous fibroid 8.33%, intrauterine adhesion 8.33% and incomplete septum 4.17%.

CONCLUSION

Hysteroscopy can be performed with minimal discomfort and superior sensitivity along with higher specificity.

KEYWORDS

Hysteroscopy, Infertility, Endometrial Cavity.

HOW TO CITE THIS ARTICLE: Shabnam JS, Someraj SS, Mahima T, et al. Role of hysteroscopic in evaluation of female infertility. J. Evid. Based Med. Healthc. 2016; 3(90), 4932-4937. DOI: 10.18410/jebmh/2016/1038

BACKGROUND

Lower pregnancy rates are observed in patients with uterine cavity anomalies. The correction of these anomalies has been associated with improved pregnancy rates. Diagnostic hysteroscopy can be performed with minimal discomfort and superior sensitivity along with higher specificity. Hysteroscopic examination is probably superior to hysterography in evaluating the endometrial cavity.[1] Furthermore, abnormal hysteroscopic findings have been reported in patients with normal hysterography or transvaginal ultrasonography.[2] Hysteroscopy has been proven to have superior sensitivity and specificity in evaluating the endometrial cavity. Mini-hysteroscopy allows evaluation of uterine cavity in an office setup with or without local anaesthetics for diagnostic and certain therapeutic interventions.[3] 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.[4] Nevertheless, hysteroscopy is a more accurate tool because of the high false positive and false negative rates of intrauterine abnormality with Hysterosalpingography (HSG). Furthermore, usage of office hysteroscopy can play an important role in detecting intrauterine pathologies in in-vitro fertilisation patients.[1,2,5] Therefore, it may have a positive impact on pregnancy outcome and treatment costs. In addition, abnormal hysteroscopic findings are significantly higher in patients with previous artificial reproductive technology failure and hysteroscopy could be seen as a positive prognostic factor for achieving pregnancy in subsequent in-vitro fertilisation procedure in women with a history of recurrent in-vitro fertilisation failure.[6]

Financial or Other, Competing Interest: None.
Submission 11-10-2016, Peer Review 21-10-2016,
Acceptance 29-10-2016, Published 10-11-2016.
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DOI: 10.18410/jebmh/2016/1038

AIMS AND OBJECTIVES

To analyse different abnormal uterine pathological findings by hysteroscopy among the study group.

MATERIALS AND METHODS

In this prospective and descriptive study, 50 infertile women with normal husband semen analysis report with either primary or secondary were considered and recruited for hysteroscopic evaluation. At Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha, from July 2015-June 2016 where insertion of hysteroscope is not possible like-complete Asherman Syndrome, cervical and vaginal agenesis were excluded from the study.

Hysteroscopy was performed in early follicular phase (6 to 10 day) using 3.9 mm continuous-flow operative hysteroscopy based on rod lens scope with short general anaesthesia. Cervical dilatation was done wherever required. The uterine cavity was distended by normal saline solution and intrauterine pressure was controlled by an irrigation device. Intrauterine pressure was set around 30 mmHg resulting in a balance irrigation flow of around 200 mL/minute and vacuum of 0.1 bar endometrial specimens were obtained. Specimen were collected in formalin solution and sent for histopathological examination.

Inclusion Criteria

All the infertile women with normal husband semen analysis report with either primary or secondary were considered for this study.

Exclusion Criteria

Where insertion of hysteroscope is not possible like:

1. Complete Asherman syndrome.
2. Cervical and vaginal agenesis.

Statistical Analysis

Data was coded and statistically analysed by SPSS version 17.0.

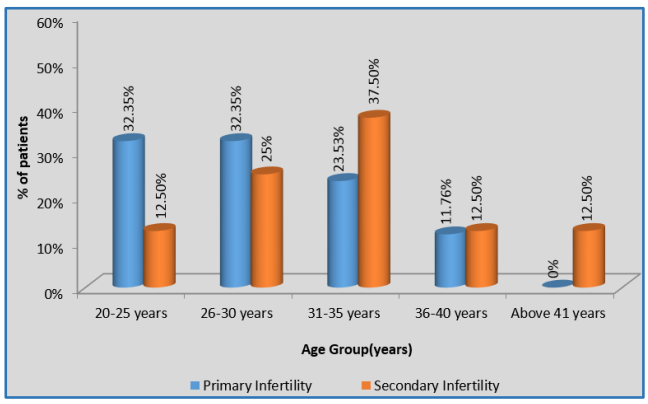
OBSERVATION AND RESULTS

Age (Years)	Primary Infertility	Secondary Infertility
20-25 years	11 (32.25%)	2 (12.50%)
26-30 years	11 (32.35%)	4 (25%)
31-35 years	8 (23.53%)	6 (37.50%)
36-40 years	4 (11.76%)	2 (12.50%)
Above 41 years	0 (0%)	2 (12.50%)
Total	**34 (100%)**	**16 (100%)**
ϰ2-value	25.07, p=0.0001	

Table 1. Age Distribution Affecting Infertility. Total Number of Patients (n=50)

In primary infertility group, 11 (32.25%) patients were in the age group of 20-25 years, whereas 11 (32.25%) patients were in the age group 26-30 years.

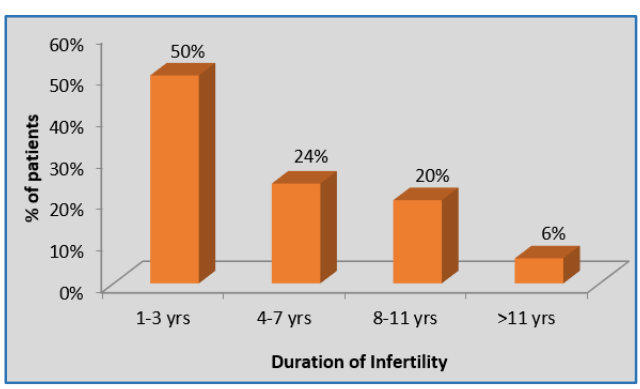
Total number of primary infertility cases were 34 and secondary infertility group contains 16 patients, out of which, 6 (37.50%) were in the age group of 31-35 yrs. By using chi-square test, statistically significant difference was found among ages of the patients of both the groups (ϰ2-value=25.07, p-value=0.0001).



Duration/Years	Number of Women Studied (N=50)	Percentage (%)
1-3 years	25	50
4-7 years	12	24
8-11 years	10	20
>11 years	3	6
Total	**50**	**100**

Table 2. Duration of Infertility n=50

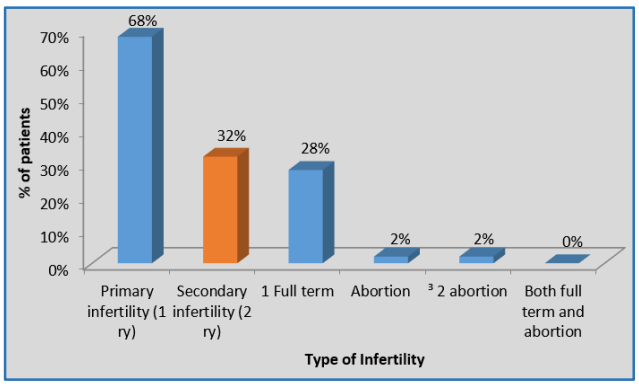
Regarding duration of infertility, 50% are patients coming under 1-3 years group of marriage and only 6% of the patient's marital life above 11 years.



Type of Infertility	Number (N=50)	Percentage (%)
Primary infertility (1 yr.)	34	68.00
Secondary infertility (2 yrs.)	16	32.00
a. 1 full term	14	28.00
b. Abortion	1	2.00
c. ≥2 abortion	1	2.00
d. Both full term and abortion	0	0.00
Total	**50**	**100**

Table 3. Types of Infertility

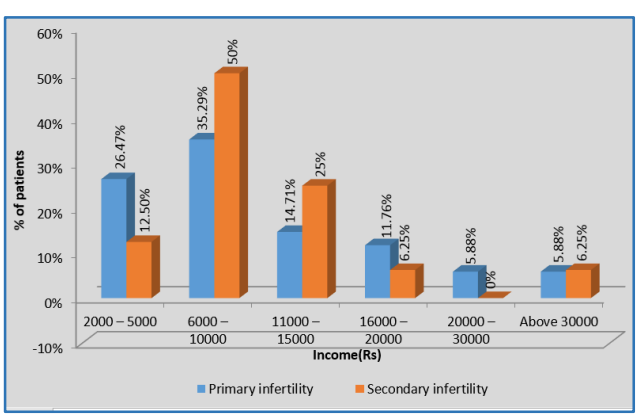
No. of patient in primary infertility group was 34 (68%), whereas 16 (32%) patients were under secondary infertility category, among secondary infertility out of which 14 (28%) had history of 1 FTND.



Income (In Rs.)	Primary Infertility	Secondary Infertility
2,000-5,000	9 (26.47%)	2 (12.50%)
6,000-10,000	12 (35.29%)	8 (50%)
11,000-15,000	5 (14.71%)	4 (25.00%)
16,000-20,000	4 (11.76%)	1 (6.25%)
20,000-30,000	2 (5.88%)	0 (0%)
Above 30,000	2 (5.88%)	1 (6.25%)
Total	34 (100%)	16 (100%)
ϰ2-value	17.48, p=0.0037, Sp<0.05	

Table 4. Family Income as per Kuppu Swami Scale (Per Month) n=50

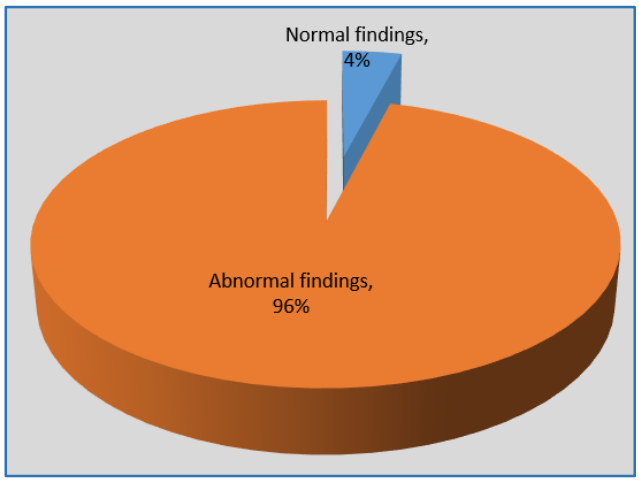
As per family earning in primary infertility category, most of the patient in 12 (35.29%) are coming (6,000-10,000) Rs/month, whereas 4 (25%) of secondary infertility group are having family income to (Rs. 11,000-15,000) another 8 (50%) are having family income (Rs. 6,000-10,000).



Findings	Number (N)	Percentage (%)
Normal findings	2	4.00
Abnormal findings	48	96.00
Total	**50**	**100.00**

Table 5. Hysteroscopic Findings in all Women n=50

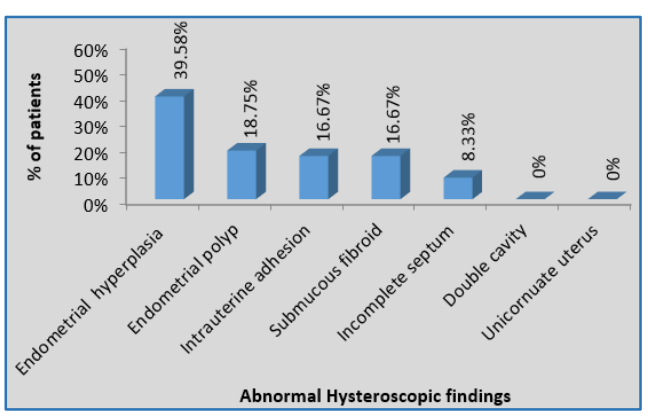
Regarding hysteroscopic finding, 4% women are having normal findings, 96% women are having abnormal findings.



Findings	Number (N)	Percentage (%)
Endometrial hyperplasia	19	39.58
Endometrial polyp	9	18.75
Intrauterine adhesion	8	16.67
Submucous fibroid	8	16.67
Incomplete septum	4	8.33
Double cavity	0	0.00
Unicornuate uterus	0	0.00
Total	**48**	**100.00**

Table 6. Different Abnormal Hysteroscopic Findings in all Women n=48

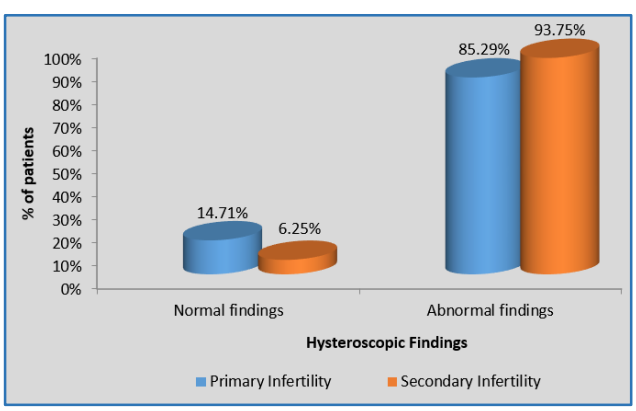
Regarding hysteroscopic finding, 4% women are having normal findings, 96% women are having abnormal findings. Out of which, 18.85% are having endometrial polyp, (39.58%) patients had endometrial hyperplasia, 16.67% patient had submucous fibroid, intrauterine adhesion 16.67% and incomplete septum 8.33%.

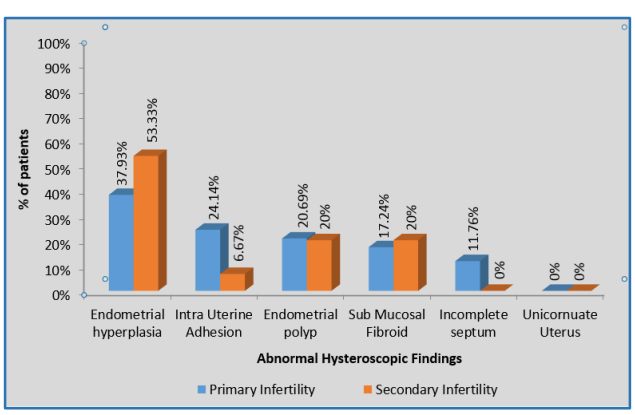


	Primary Infertility (33)	Secondary Infertility (15)	P value
Endometrial hyperplasia	11 (37.93%)	8 (53.33%)	7.34, p=0.006,S
Intrauterine adhesion	7 (24.14%)	1 (6.67%)	11.03, p=0.0009,S
Endometrial polyp	6 (20.69%)	3 (20%)	0.03, p=0.86,NS
Submucosal fibroid	5 (17.24%)	3 (20%)	0.29, p=0.58,NS
Incomplete septum	4 (11.76%)	0 (0%)	12.77, p=0.0004,S
Unicornuate uterus	0 (0%)	0 (0%)	-
Total	**33**	**15**	**-**

Table 7. Hysteroscopic Findings According to the Type of Infertility n=48

According to type of infertility in primary category 33(%) patients were having abnormal findings, out of which, majority 11 (37.93%) had endometrial hyperplasia. In secondary infertility group, 15(%) patients were having abnormal findings, out of which, 8 (53.33%) patients had endometrial hyperplasia, p<0.05, which is statistically significant.

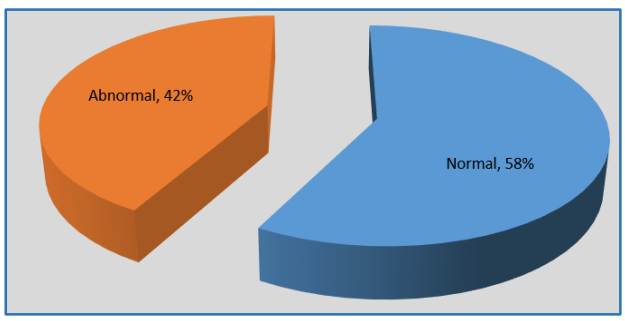




Findings	No.	Percentage
Normal	29	58.00
Abnormal	21	42.00

Table 8. The Assessment of Uterine Cavity by Transvaginal Ultrasound in Infertile Women n=50

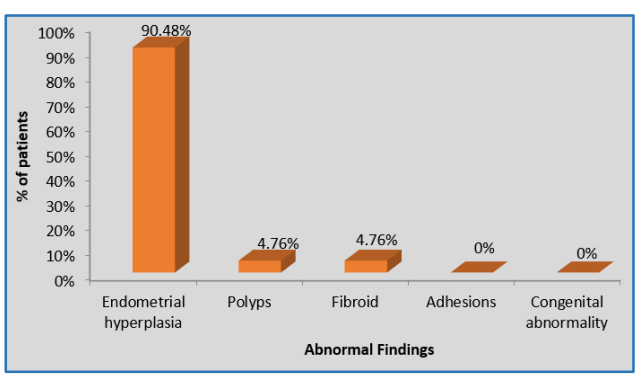
By TVS (transvaginal sonography), 29 (58%) patients had normal findings whereas 21 (42%) patients had abnormal findings, out of which, 19 (90.48%) patients had endometrial hyperplasia.



Findings	No.	%
Endometrial hyperplasia	19	90.48
Polyps	1	4.76
Fibroid	1	4.76
Adhesions	0	0.00
Congenital abnormality	0	0.00
Total	**21**	**100**

Table 9. Different Abnormal Uterine Cavity Findings by Transvaginal Ultrasound in Infertile Women n=21

By TVS (transvaginal sonography), 29 (58%) patients had normal findings, whereas 21 (42%) patients had abnormal findings, out of which, 19 (90.48%) patients had endometrial hyperplasia.



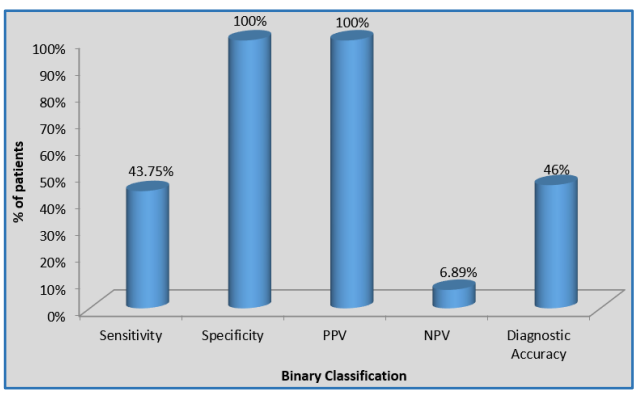
USG (TVS) Transvaginal Sonography		Total
Normal	**Abnormal**	
21 (42%)	29 (58%)	50 (100%)

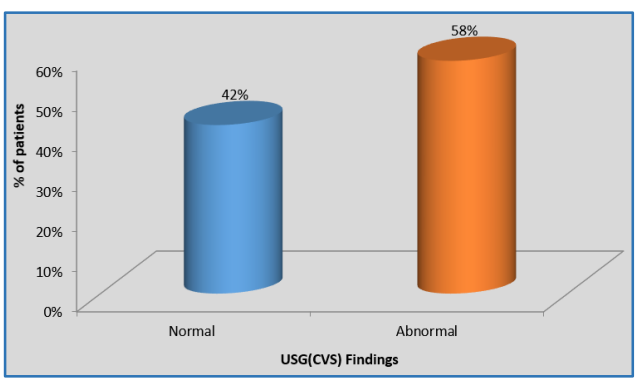
Table 10. Binary Classification for Ultrasonography (TVS) Transvaginal Sonography n=50

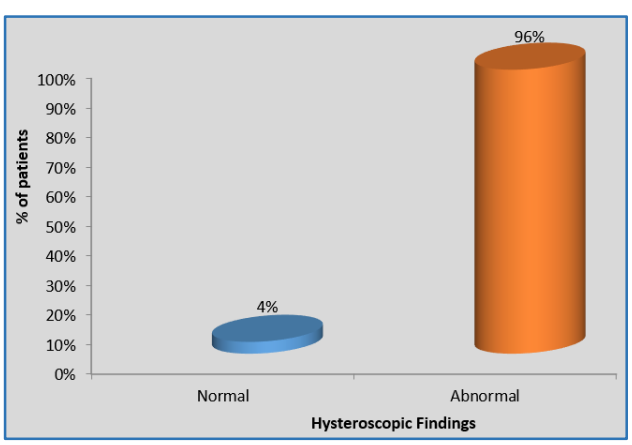
Hysteroscopy		Total
Normal	Abnormal	
2 (4%)	48 (96%)	50 (100%)

Table 11. Binary Classification for Hysteroscopy

- Sensitivity=43.75% (CI=29. 48-58.82%).
- Specificity=100% (15.81-100%).
- Positive Predictive Value=100% (83.89-100%).
- Negative Predictive Value=6.89% (0.84-22.77%)
- Diagnostic Accuracy=46%.







Statistical analysis was done by using descriptive and inferential statistics using chi-square test and binary classification and software used in the analysis was SPSS 17.0 version and GraphPad Prism 6.0 version and $p<0.05$ is considered as level of significance.

DISCUSSION

Hysteroscopy remains the gold standard for the evaluation of the uterine cavity and for the detection and treatment of intrauterine pathologies. All the range of cavitary pathology can be diagnosed with the application of the technique treatment can be applied immediately and of most important, specimen and directed biopsy specimen can be sent and histopathological examination by Ahmed et al, 2011.[7]

In our study, most of the patients (50%) were married for (1-3) years and (24%) were in the group of (4-7) years married life, which corroborating with the findings of Ahmed M. et al 2013.[7]

In our study, 68% of the patients are coming under primary infertility and 32% in the secondary infertility group, there was one retrospective study of 274 (63.43%) women with primary infertility and 158 (36.57%) with secondary infertility. This study was comparable with our findings.

The average age of active married life for the 50 patients of infertility 2-4 years in primary infertility and 3-8 years in secondary infertility and one study Suman Puri et al 2015[8] showed that 50 patients with infertility was 6.8±5 years for primary as compared 8.3±4.6 years for secondary infertility.

Majority regarding family earning, majority of primary infertility are coming under (6,000-10,000) Rs., whereas (38.10%) are coming under income group of (2,000-5,000) Rs./month and same no. are coming under (6,000-10,000) Rs./month, which is not statistically significant.

4% of the patients had normal uterine cavity, but majority of the patients 96% had abnormal hysteroscopic findings comprising endometrial hyperplasia 19.79%, endometrial polyp 9.38%, submucous fibroid 8.33%, intrauterine adhesion 8.33% and incomplete septum 4.17%.

In a recent study by Suman Puri et al 2015,[8] septate uterus areas found in 4% of cases and submucous fibroid 8% of cases, which is similar to our study.

In another study by Ahmed M. et al 2013,[7] 432 infertility patients, they found out abnormal hysteroscopic finding in (20.37%) cases, out of which, endometrial polyp was seen in (26.13%), intrauterine adhesion (31.81%), submucous fibroid (7.5%) and unicornuate uterus (12.5%). It has been established that submucosal myoma negatively impact fertility and pregnancy rate as the endometrial receptibility is globally impaired throughout the uterine cavity (22,27) and surgical removal of submucous myoma leads to improve pregnancy rate. Also, it has been demonstrated that small endometrial polyps are common findings on hysteroscopic assessment of infertility. In our study (9.38%) women with increase in pregnancy after removal of such lesion.

By (TVS) transvaginal sonography, 58% patients have normal findings, whereas 42% patients has abnormal findings, out of which, (90.48%) patients has endometrial hyperplasia.

In our study, 96% of patients had abnormal finding, out of which, (19.79%) patient had endometrial hyperplasia.

In an infertile population, prevalence of adhesions lies between (0.3%-14%). In our study, it is (8.33%). It has been reported that mild intrauterine adhesions can cause

infertility due to changes in the functional aspects of the endometrium and hysteroscopic adhesiolysis are safe, effective method of choice for restoring menstrual function and fertility. As per study, Ahmed et al 2011[7] founded abnormal hysteroscopic finding in 40% of the infertile women and 75% of these abnormalities could be related to infertility and benefit from a specific treatment. Sala et al 1998[9] suggest hysteroscopy as a routine exam in infertile women, because it would be economically advantageous and can be discharged from the hospital on the same day.

Complication of hysteroscopy are reported in (1-3%) of cases. These include cervical laceration, uterine perforation, bleeding and reactions to distention media or anaesthesia.

SUMMARY AND CONCLUSION

My result shows that the incidence of uterine pathologies in women with primary and secondary infertility approximates 96%. Among the different types of uterine pathology found, though highest were endometrial hyperplasia, but other findings like endometrial polyp and intrauterine adhesions were undiagnosed by TVS (transvaginal sonography). Thus, it is justifying in our hypothesis that use of diagnostic hysteroscopy in the primary routine investigation (gold standard) in evaluation of infertile woman either primary or secondary.

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