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RESEARCH ARTICLE

A STUDY OF ROLE OF HYSTEROSCOPY IN INFERTILITY

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ABSTRACT

Introduction: Infertility is a bane of modern living. It inflicts devastating emotional trauma on the individual for being unable to fulfill the biological role of parenthood. In India, 10-15% of the couples are infertile. There is an increased demand for diagnostic and therapeutic intervention for management as infertility is a social stigma. This study is aimed to assess the role of hysteroscopy in workup of female infertility and analyze if this is the primary method in evaluation of infertility after hormonal profile and semen analysis. **Materials and methods:** A retrospective analysis of 100 infertile patients was carried out for a period of 1 year at Santati IVF centre, Thane. Various factors such as cervical, tubal and endometrial were analyzed as post hysteroscopy findings as the cause of infertility. **Results:** Hysteroscopy was performed in 100 infertile women, out of which 56(56%) presented with primary infertility and 44(44%) women were with secondary infertility. Normal intrauterine finding were found in 43 women (43%). Abnormal hysteroscopic findings were found in 57 women of which maximum women were primary infertility (39%). Cervical factor abnormalities were found in 17% of women either in form of erosion (9%) or internal Os stenosis (8%). Most common finding in primary infertility group was uterine septum (10%) followed by endometrial polyp, small uterine cavity, intrauterine adhesion, T-shaped cavity and sub septate uterus. However, in one patient finding of an unicornuate uterus was achieved. In secondary infertility group, abnormal Intrauterine Findings Were Detected In 23/44 Women, The Most Common Finding Being Endometrial polyp. In primary infertility group, 10 women had undergone septoplasty and 7 metroplasty, 4 had polypectomy, 3 had adesiolysis and ostia opened for 2. In secondary infertility group, metroplasty was the most common interventional procedure done (9%) followed by polypectomy, septoplasty, adhenolysis and opening of blocked ostia. **Conclusion:** Hysteroscopy is effective in not only evaluation of infertility but also in correcting the causal factors. In view of above findings of the study, it seems worthwhile to consider hysteroscopy as the first line of investigation for evaluation of female infertility after the initial investigations are within normal limits.

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INTRODUCTION

Infertility is a disease of reproductive system defined by failure of achieving of clinical pregnancy after 12 months or more of regular unprotected sexual intercourse according to WHO revised glossary of assisted reproductive technology (Human Reproduction, 2009).

Secondary Infertility: When a women is unable to bear a child either due to the inability to become pregnant or inability to carry pregnancy to live birth following a previous ability to carry a pregnancy to live birth (Human Reproduction, 2009). As groups within countries have improved their living

standards, health conditions have improved, morbidity and mortality have declined. Fertility has declined due to adoption of fertility constraining behavior. For a healthy couple probability of getting pregnancy for a reproductive cycle is 20-25%, cumulative probability of conception is 60% in first 6 months, 84% in first year and 92% in second year of regular fertility focused sexual activity (Remah M Kamel, 2001). Most common causes of infertility are male factor such as sperm abnormalities, female factors such as ovulation dysfunction and tubal pathology, combined male + female factors and unexplained where no obvious cause can be determined. The endometrial cavity and the endometrium are a major defining factors for causing explained and unexplained infertility in women. Pathologies within the uterine cavity are the cause of infertility in as many as 15% of couples seeking treatment and are diagnosed in more than 50% of infertile patients (Brown, 2000). Over the ages, the recommendations for first line of

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investigations has changed considerably. With the advent of USG especially TVS with Doppler, diagnostic laparoscopy can be considered too invasive by many. Tubal patency can nowadays be verified by saline infused sonography (SIS). SIS can also detect intrauterine abnormalities with sensitivity and specificity of 88% and 94 % respectively (Seshadri, 2015). So, unless some corrective surgery is required laparoscopy should be considered superfluous. The endometrial cavity however is another thing. Even with advent of 3D USG, a septum or intrauterine adhesions can be missed. Also there is always a need for histopathological diagnosis to detect hormonal status and to rule out endometrial TB in a patient especially in the Indian subcontinent. The overall sensitivity and specificity of TVS USG in diagnosis is estimated at 79% and 82%, respectively (Niknejadi, 2012). HSG can diagnose uterine abnormalities to a certain extent but it has its own setbacks. An air-bubble can often be confused for a polyp plus the failure to put dye in the cavity through a stenosed cervix can lead to a false impression of uterine synechia. Hence, a hysteroscopy can be said to be a middle path as minimally invasive investigation for diagnosing cause of female infertility. With advent of the office hysteroscope, the need for a OT with additional infrastructure is also done away with. Small procedures like septum resection and submucous myoma resection can easily be done. Hysteroscope can also give a fair idea about the endocervical canal. Thus, hysteroscopy should be considered as first line investigation in a infertile woman. This study was thus undertaken to diagnose an intrauterine cause of infertility in a series of infertile women.

Hysteroscopy is the endoscopic visualisation of the endometrial cavity. It was reported in 1869 by Panteleoni. This was followed by Rubin in 1925 who used CO₂ for distension. However, it was only after use of liquid distension media in the 1970 that hysteroscopy started becoming popular. The resectoscope used by urologist was gradually modified for use in hysteroscopic procedures. Over the past decade refinements in optic and fibre optic technology have dramatically improved the visualisation. Nowadays we have the commonly used hysteroscope between 3 – 5 mm diameters.. Also flexible hysteroscope are available now with a tip that deflects over a range of 120-160°. The light sources have undergone transformation from tungsten to metal halide to xenon to a LED light source which is common place nowadays. A loop is used for cutting and a ball for coagulation. The disadvantage being use of non-physiologic non conducting solution like glycine. Bipolar hysteroscopes are now easily available which have increased the safety margin as they can be used in a physiologic saline solution used for distension. Different media used for hysteroscopy include CO₂ dextran, NS, RL, 5% Mannitol, 3% sorbitol and 1.5% glycine (Marlow, 1995). Hysteroscopy is considered as gold standard in diagnosis of intrauterine pathology. Although WHO recommends office hysteroscopy in females who are suspected having intrauterine abnormalities on clinical basis or complementary exams, many clinicians feel direct view of the uterine cavity offers a significant advantage.

MATERIAL AND METHODS

A retrospective observational study was undertaken at Santati IVF centre, Thane over a period of one year. 100 infertile women who underwent hysteroscopy were included in this study.

After clinical evaluation and required physician fitness, a detailed informed consent was taken. Hysteroscopy was performed in operation theatre by using a 3 mm 30 degree Hysteroscope (Scholly) in a 4 mm diagnostic sheath. No prior cervical dilation was done. In some cases of internal os stenosis however dilataion was done till no 6 F. All procedures Were done under General Anesthesia. Distension of uterine cavity was achieved by normal saline with hysterosmat setting of intrauterine pressure set at 100mm. Vaginoscopy was done followed by examination of external os and the endocervical canal. after entering the uterine cavity all the walls and both ostia visualised. If any pathology was visualized, operative procedure was done at the same sitting. Scissors were used to cut septum in majority of cases. Few cases of lateral metroplasty were done with monopolar resectoscope with glycine as distension media. Rest were done with endoknife. Polyps were resected with monopolar resectoscope. In case of a lateral metroplasty and intrauterine adhesions resection, a Foley catheter was inserted intrauterine and balloon distended with 5cc saline and kept for 7 days. Endometrial sample was taken for histopathological evaluation and TB-PCR.

RESULTS

Hysteroscopy was performed in 100 infertile women, out of which 56(56%) presented with primary infertility and 44(44%) women were with secondary infertility. Among 100 women with age of range 20-50 years, 45% women were of range <35 years. The mean age was 32.5. The women in secondary infertility group (33.63 yrs) were elder as compared to women in primary infertility group (mean age 31.08 yrs). However, the difference was not statistically significant. Normal intrauterine findings were found in 43 women. Majority of them presented with primary infertility (26%). Abnormal hysteroscopic findings were found in 57 women, of which maximum were from primary infertility group (39%).

Hysteroscopic findings	Primary	Secondary
Normal	26	17
Abnormal	39	18

Cervical factor abnormalities were found in 17% of women, either in form of erosion (9%) or internal os stenosis (8%).

Abnormality (cervical)	Primary	Secondary
Erosion	6	4
Internal os stenosis	5	2
No abnormality	44	39

Intrauterine pathology was diagnosed in 48/100 women. Most common finding in primary infertility group was uterine septum (10%) followed by endometrial polyp, small uterine cavity, intrauterine adhesion, T-shaped cavity and subseptate uterus. However, in one patient finding of unicornuate uterus was achieved.

In secondary infertility group abnormal intrauterine findings were detected in 23/44 women. The most common finding was endometrial polyp.

Out of 100, 22 women had abnormal endometrial findings i.e either hypertrophic endometrium or scanty endometrium or polypoidal.

Abnormality (intrauterine)	Primary	%	Secondary	%
Septum	10	17.86%	5	11.36%
T shaped	3	5.36%	4	9.09%
Adhesions	3	5.36%	3	6.82%
Polp	4	7.14%	6	13.64%
Small uterine cavity	4	7.14%	5	11.36%
Subseptate	1	1.79%	0	0.00%
Unicornuate uterus	1	1.79%	0	0.00%
No abnormality	30	53.57%	21	47.73%

Abnormality (endometrial)	Primary	Secondary
Scanty	5	1
Polypoidal	1	4
Hypertropic	7	3
No abnormality	43	36

In either of the infertility group, 14 women having abnormal tubal ostia findings on hysteroscopy. Ostia were not seen in around 11 women in both the groups. In primary infertility group, 1 woman had blocked ostia while 2 had fibrosed ostia.

Abnormality (tubal)	Primary	Secondary
Blocked	1	0
Fibrosed	2	0
Not seen	6	5
No abnormality	47	40

In primary infertility group, 10 women had undergone septoplasty, 7 had metroplasty, 4 had polypectomy, 3 had adhesiolysis and ostia opened for 2. In secondary infertility group, metroplasty was the most common interventional procedure done (9%) followed by polypectomy, septoplasty, adhesiolysis and opening of blocked ostia.

Heading- Interventional procedure done	Primary	Secondary
Septoplasty	10	5
Polypectomy	4	6
Adhesiolysis	3	3
Metroplasty	7	9
Ostia opened	2	1

DISCUSSION

Evaluation of uterine cavity is one of the most important step in evaluating a female for infertility. Congenital and acquired disorders of uterine cavity can lead to impairment of endometrium and thus interfering in embryo implantation and growth of fetus (Razzak, 2002). Uterine pathology accounts for less than 10 percent of cases of female infertility (Valle, 2008). Hysteroscopic evaluation of the uterine cavity not only diagnosis the pathology but also gives an opportunity to treat the same at the same sitting. With this benefit, hysteroscopy is often the first line of investigation in case of a suspected uterine pathology. In our series of patients, septate uterus was the most common pathology diagnosed. What constitutes a septum is however open to debate. Normal uterine cavity often has a small septum in the midline. Some investigators would call it normal and some would call it an arcuate uterus. Whether an arcuate uterus accounts for infertility or subfertility or repeated abortions is not very clear. There are no studies which can show a clear benefit in surgical treatment of a small septum (Nayak, 2013). Anecdotal references reveal bizarre treatments to treat a "small" uterus, these would include Putting in a Lippe's loop inside the Uterine Cavity. The rationale being that the uterus would contract in presence of a foreign body and cause hypertrophy of muscle resulting in an enlarged cavity. These treatments haven't stood the test of time

and were soon discarded. We are still not sure whether cutting a small septum results in a better. In our series,, a total of 15 patients were identified with a septum. Septum resection was done in these patients. The rationale was these patients should not end in an abortion due to the septum after conception, though there is insufficient data to support the above. One patient had a small septum which was untouched. A T shaped cavity was observed in total 7 patients. A T shaped cavity was diagnosed when the cavity was cylindrical rather than spreading out laterally from internal os and upwards. Also it was necessary to rotate the hysteroscope all the way laterally in order to view the tubal opening on both sides. A lateral wall metroplasty was performed in all cases of a T-shaped uterus. The benefit of a metroplasty is, however, not known. The uterus is a distensible organ and does not need to be incised internally according to some investigators. However, in an ongoing study by same authors we have managed to get some encouraging data, though not very significant. Only time and detailed study will tell us the value of these procedures.

Intrauterine adhesions were found in a total of 6 patients, 3 in primary and 3 in secondary. These were of the grade 2 variety in 5 cases and were cut with scissors followed by estrogen therapy for a month. One patient had grade 3 adhesions which were cut with scissors followed by insertion of a Foley's catheter balloon with 5cc normal saline for seven days plus endometrial estrogen treatment for a month. (Grades of Ashermans syndrome Society for hysteroscopy 1989). Polyps were observed in a total of 10 patients. All of them were of the endometrial polyp variety. There were no fibroid polyp in our series. These endometrial polyps often reflect the hyperestrogenic stage of the woman due to chronic anovulation and cannot be the principal reason for the infertility (Hinckley, 2004). Needless to say, they were removed using a resectoscope and all of them were reported as benign endometrial polyp without any cellular atypia. Diagnostic hysteroscopy should be used routinely in infertile women and persistent functional endometrial polyps, even if small, are likely to impact fertility so removal of such lesions should be done to improve subsequent reproductive performance (Jain, 2016), 9 patients were diagnosed with having a small endometrial cavity. A normal intrauterine volume of the endometrial cavity is between 10 to 15 cc. 3D USG is able to calculate the volume to a certain extent. On hysteroscopy however it was the subjective opinion of the surgeon as to what constitutes a small cavity. A increased myometrial tone leading to increased resistance to distension leading to a false positive finding could also be a confounding factor in this diagnosis. There was no attempt to confirm the finding before or later with a 3D USG. Since patients were under anaesthesia a metroplasty (lateral) was performed in all patients suspected of having a small cavity. This was followed by an intrauterine balloon fo 5cc normal saline plus endometrial estrogen treatment for a month.

One patient was found to have unicornuate uterus. This patient had previously undergone a laparoscopy and found to have blocked tubes and was posted for IVF. So this finding came as a surprise. It was not mentioned in her previous papers. So we can only surmise that she has a non communicating horn. As per the protocol, metroplasty procedure was performed in this patient followed by a Foley's catheter balloon with 5cc normal saline plus estrogen treatment for a month. In 11 patients, the tubal ostia were not seen and covered by a layer of endometrium.

With a gentle probing of a forceps these could be seen very. In 3 patients, however, the internal opening was found to be fibrosed and needed to be cannulated. Cannulation was successful in all 3 cases. A laparoscopy was done subsequently in these patient and tubal patency was confirmed in these.

Conclusion

In view of above findings of the study, it seems worthwhile to consider hysteroscopy as first line of investigation for evaluation of female infertility after the initial investigations are within normal limits.

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