Uterine Anomalies in Infertility - An Evaluation by Diagnostic Hysterolaparoscopy

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ABSTRACT

BACKGROUND
About 10 - 15 % of reproductive age couples are affected by infertility.¹ According to WHO 60 - 80 million couples currently suffer from infertility.² Prevalence of infertility is rapidly increasing globally.³ Uterine factors of infertility include uterine anomalies, fibroid uterus, synechiae, Asherman's syndrome, and failure of implantation without any known primary causes. Congenital uterine malformations are seen in 10 % cases of infertile women. We wanted to evaluate the anomalies of uterus in case of primary and secondary infertility by DHL (diagnostic hysterolaparoscopy).

METHODS
This is a hospital-based, observational study, conducted in the Department of Obstetrics and Gynaecology, VIMSAR, Burla, from November 2017 to October 2019. Diagnostic hysterolaparoscopy was done in 100 infertility cases.

RESULTS
In our study, uterine anomaly i.e. septate uterus was the most common hysteroscopic abnormality found in 23 cases followed by submucous fibroid, polyp, synechiae and bicornuate uterus.

CONCLUSIONS
With proper selection of cases, and when done by skilled surgeon, can be considered as standard day care procedure for female infertility evaluation.

KEYWORDS
Infertility, Uterine Anomalies, Diagnostic Hysterolaparoscopy

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DOI: 10.18410/jebmh/2020/580

How to Cite This Article:
Pande B, Padhan S, Pradhan P. Uterine anomalies in infertility-an evaluation by diagnostic hysterolaparoscopy. J Evid Based Med Healthc 2020; 7(48), 2831-2835. DOI: 10.18410/jebmh/2020/580

Submission 03-09-2020,
Peer Review 10-09-2020,
Acceptance 17-10-2020,
Published 30-11-2020.

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BACKGROUND

About 10 - 15 % of reproductive age couples are affected by infertility.¹ According to WHO 60 - 80 million couples currently suffer from infertility.² Prevalence of infertile individuals is rapidly increasing globally³. Incidence of female infertility is 42.8 %, male infertility is 35.5 % and both accounts for some cases, which varies from region to region.⁴

Infertility may be primary or secondary infertility. By WHO primary infertility is defined as “inability to conceive within 12 months of exposure to coitus (i.e. sexually active, non-contracepting and non-lactating) among women of 15 to 40 years old”.⁵ Secondary infertility is the inability to conceive following a previous pregnancy. Infertility is caused by male and / or female factors. Female factor infertility can be divided into several types; uterine or cervical, ovarian, tubal and others.⁶

Uterine factors include uterine anomalies, fibroids uterus, synechiae, Asherman’s syndrome & failure of implantation without any known primary causes. The diagnosis and management of infertility is one of the most rapidly evolving subject in medicine. Pelvic pathology in infertile women is not well appreciated by routine pelvic examinations and the usual diagnostic procedures.⁷

Laparoscopy is a minimally invasive surgery. It popularity has increased due to various advantages over a short period of time. Philip Bozzini described it in 1805. Since 1980 the use of diagnostic and operative laparoscopy has increased.⁸ As shown by various studies diagnostic hysterosalpingoscopy is effective procedures for evaluation of long term infertility.⁹

Laparoscopy reveals abnormal findings in 21.68 % of infertility cases which was normal by hysterosalpingography.¹⁰ Also, diagnostic hysteroscopy is a very important method for investigation of the uterine causes of female infertility.¹¹ Laparoscopy has become an essential part of infertility workup by its ability to visualize and manipulate the uterus, fallopian tube and the ovaries.

Diagnostic laparoscopy is thus essential in determining the optimal management plan.¹² Diagnostic laparoscopy when combined with hysteroscopy provides useful information regarding mullerian anomalies, pelvic pathologies and tubal function. Additionally in the same setting definitive surgical procedures can be performed like removal of endometrial polyp, septal resection during hysteroscopy & adhesiolysis, ovarian drilling, myomectomy, removal of subserous fibroid during laparoscopy.¹³

The question of tubal morphology and patency, ovarian morphology on suspected pelvic pathology and uterine cavity abnormalities can be resolved with accuracy at one session.¹⁴ Congenital malformations of the female genital tract are defined as deviations from normal anatomy resulting from embryological maldevelopment of the mullerian or paramesonephric ducts. They represent a common benign condition with a prevalence of 4 - 7 %.¹⁵ Depending on the type and degree of anatomical distortion, they are associated with health and reproductive problems.¹⁶

Indications of DHL were Duration of infertility for more than 3 years, couple treated actively for infertility for more than 6 months, positive findings in ultrasonography & positive findings in hysterosalpingography.

METHODS

Hospital based, observational study in department of Obstetrics and Gynaecology, VIMSAR, Burla. From November 2017 to October 2019. Study was approved from Institutional Research and Ethics Committee, VIMSAR Burla. Convenient sampling was done. Inclusion criteria were patients aged 20 - 40 years with primary and secondary infertility of more than one-year duration & who were undergoing DHL. Sample size was as per the admission rate in hospital. Patients with known pelvic inflammatory diseases & genital tract tuberculosis, severe cardiac / respiratory illness or with anaesthesia problems were excluded from the study. Detail information taken regarding socio demographic profile, menstrual history, obstetric history, history of previous operations, medical illness. Duration of infertility, Age of menarche, Last menstrual period, duration of flow, amount of flow, interval between two menstrual cycles, any other associated menstrual abnormality like dysmenorrhea, discharge per vagina noted. In secondary infertility, number of previous pregnancies, number of viable births, number of alive children, age of last child birth, nature and place of delivery and complications like history of puerperal sepsis, history of abortions or ectopic pregnancy were taken. Past medical, surgical & personal history was taken. History of addiction, drug allergy, contraceptive history, family history of tuberculosis & diabetes was taken. Detailed general and systemic examinations were done. Pelvic examination include inspection, speculum examination, bimanual examination. Routine investigations like complete blood count (Hb, DC, TLC,) BT, CT, fasting blood sugar, HIV, HBsAg, HCV, Urine-R & M, LFT, RFT, serum Na, serum K, ECG were done in all patients. Specific tests for syphilis, VDRL, Mantoux test, hormonal analysis (TSH, PRL, FSH, LH) were done in all. USG was done. Seminal fluid analysis of male partner was done in primary infertility.

After taking written and informed consent, 100 cases of infertility were selected. Diagnostic hysterolaparoscopy was done in the proliferative phase. Prostaglandin gel or tablet-400 micrograms kept in posterior fornix 6 hours prior to surgery. The patient is placed in modified lithotomy under general anaesthesia.

Hysteroscopy

Cervix exposed with sim’s speculum and its anterior lip is held with allis forceps. Diagnostic hysteroscopy was done with a 4 mm, 30-degree fiber optic rigid hystroscope with a 5 mm diagnostic sheath. The distension media was normal saline. After distending the cavity, endocervical cavity, anterior and posterior wall, fundus and both cornu visualized. Abnormalities like polyp, myoma, septum, sub septum, synechiae were identified. While visualizing the cornu, both ostia seen, and appropriate therapeutic measures were taken in the same setting. Laparoscopy was
done with one 10 mm and one 5 mm port. With 30-degree telescope, pelvis inspected in a systematic manner including uterus, fallopian tubes, round ligament, uterosacral pouch, uteroovarian ligaments and pouch of Douglas. Length and shape of the tubes were inspected. Size, shape and thickness of both ovaries noted. Presence of peripheral follicles, ovulation stigma and the relationship with fimbrial end of tubes was observed. Peritubal, periovian and omental adhesions, tubo ovarian masses, endometriotic deposits, fibroid, presence of fluid in pouch of Douglas or any pathology, if present was noted. Another 5 mm port was inserted, where abnormalities were detected for proper intervention. Out of 100 patients, Primary infertility comprises of 83 % (83 cases) and secondary infertility comprises of 17 % (17 cases).

**RESULTS**

Most patients with primary infertility were of age 20 - 25 years i.e., 47 % followed by those belonging to age group of 26 – 30 year i.e., 24 %. In secondary infertility maximum patient were of age 26 - 30 year i.e. 53 % followed by 31 - 35 year i.e. 35.2 %. Mean age on infertility was 28.4 year.

| Age Group | Total | Primary Infertility | Secondary Infertility |
|-----------|-------|--------------------|----------------------|
| 20 - 25   | 39    | 30 (47 %)          | 9 (0 %)              |
| 26 - 30   | 29    | 20 (24 %)          | 9 (33 %)             |
| 31 - 35   | 20    | 14 (17 %)          | 6 (35.2 %)           |
| 36 - 40   | 10    | 8 (80 %)           | 2 (11.8 %)           |
| 40 - 45   | 2     | 2 (2.4 %)          | 0 (0 %)              |
| Total     | 100   | 83                 | 17                   |

Table 1. Age Distribution

| Recent Years | Total | Primary Infertility | Secondary Infertility |
|--------------|-------|--------------------|----------------------|
| 1 - 3 years  | 27    | 27 (33 %)          | 0 (0 %)              |
| 4 - 6 years  | 44    | 31 (37 %)          | 13 (76 %)            |
| 7 - 9 years  | 11    | 9 (10.8 %)         | 2 (12 %)             |
| 10 - 12 years| 10    | 9 (10.8 %)         | 1 (6 %)              |
| > 12 years   | 8     | 7 (8.4 %)          | 1 (6 %)              |
| Total        | 100   | 83                 | 17                   |

Table 2. Duration of Married Life

Maximum number of causes of primary infertility and secondary infertility were reported after a period of 4 - 6 years of infertility i.e. 37 % and 76 % respectively, followed by 1 - 3 years in case of primary infertility and 7 - 9 years in case of secondary infertility. 9 cases of primary infertility reported after 10 - 12 years i.e., 10.8 % and only 1 case (6 %) of secondary infertility &7 cases (8.4 %) of primary infertility reported after 12 year.

In our study, majority cases of secondary infertility i.e., 53 % cases undergone normal vaginal delivery, among them 12 % cases were of intra uterine death. 3 (17 %) cases had previous history of spontaneous abortion. Out of 17 cases 6 % underwent suction and evacuation.

Maximum number of cases both in primary (70 %) and secondary infertility (53 %) group were found to have normal menstrual cycles. Oligomenorrhoea (20 %) was the commonest menstrual pattern associated with primary infertility followed by menorrhagia and hypomenorrhoea, whereas in secondary infertility group hypomenorrhoea (23 %) was most common followed by menorrhagia and oligomenorrhoea. In our study 68.7 % of primary infertility and 52.9 % of secondary infertility shows no abnormality in diagnostic hysterosalposcopy. In 24.1 % of primary infertility and 17.6 % of secondary infertility cases, uterine septum was detected. Submucous fibroid or fibroid was detected in 3.6 % and 17.6 % of primary and secondary infertility respectively. Polyp was reported in only one case of both primary and secondary infertility respectively. Asherman syndrome was detected in only one case of primary infertility and synechiae was reported in only one case of secondary infertility. Bicornuate uterus was reported in only one case of primary infertility.

**DISCUSSION**

In chromopertubation test, 62 shows bilateral spillage (74.7 %), 12 unilateral spillages (14.4 %), 9 no spillage (10.8 %) in primary infertility cases. In secondary infertility 10 out of 17 shows bilateral spillage, 4 shows unilateral spillage, 2 no spillage, 1 shows restricted spillage. In our study 83 % of patients were primary infertility and 17 % patients were secondary infertility.
28.4 years. In a study by Samipa J Shah et al 63 % patients were among 20 - 30 years of age, with mean age of 26.5 years. Maximum number of cases of primary infertility i.e. 31 out of 83 i.e. 37 % reported after a duration of 4 - 6 years of primary infertility. Among the cases of secondary infertility, 13 out of 17 i.e. 76 % of cases consulted after a duration of 4 - 6 years. In a study by Samipa J Shah et al, 53 % patients with > 5 years of active married life followed by 37 % with 2 - 5 years of active married life. 16

70 % cases of primary infertility and 53 % cases of secondary infertility had normal menstrual cycles. Oligomenorrhea was the commonest menstrual abnormality i.e., 17 % in primary infertility followed by menorrhagia and hypomenorrhea. Hypomenorrhea was most common (23 %) in secondary infertility. In a similar study done by Peterson J. P. (1987), menorrhagia was reported in 21 % of cases of secondary infertility and oligomenorrhea in 18 % of cases of primary infertility. Seth S.S. observed menorrhagia in 16.7 % of cases and oligomenorrhea in 14.4 % cases.

In a study by Nayak PK et al,15 septate uterus was the most common intrauterine abnormality. In our study, uterine anomaly i.e., septate uterus was the commonest hysteroscopic abnormality found in 23 cases followed by submucous fibroid, polyp, synchiea and bicornuate uterus. The prevalence of septate uterus is same in infertile and fertile women (approximately 1 %) but is higher in recurrent pregnancy loss (approximately 3.5 %).17

Among all the congenital uterine abnormalities, septate uterus is the most common cause associated with highest reproductive failure rates17. In the select population of women with a septate uterus and recurrent pregnancy loss, live births rates are approximately 10 % before hysteroscopic septal resection and 75 - 80 % after surgery, indicating that hysteroscopic metroplasty restores an almost normal pregnancy for term delivery.18

Apart from septate uterus, myoma and polyps were other major hysteroscopic abnormalities in their study.19 There is relatively less evidence to suggest that uterine myoma causes infertility: the bulk of it is derived from studies that had compared the prevalence of myomas in fertile and infertile women or the reproductive performance of women with otherwise unexplained infertility before and after myomectomy.20 The incidence of asymptomatic endometrial polyps in women with infertility has been reported to range from 10 % - 32 %.21

In a study by Samipa J. Shah et al (2014), in 40 % cases, abnormal pathology noted through hysteroscopy such as myomas, endometrial hyperplasia, polyp, adhesions, septum etc.16 In another study by V Nandhini et al, they observed Hysteroscopy reveal normal findings in 37 (74 %) patient, and abnormal findings in 26 % patients. Out of 26 %, endometrial polyp 6 %, cervical stenosis 2 %, submucous fibroid (8 %), anomalous uterus (2 %), hypoplastic uterus (2 %), Asherman syndrome (2 %).

In my study out of 83 cases of primary infertility, 17 cases (24.1 %) were uterine septum. 3 cases (3.6 %) were fibroid, and 1 case of polyp, Asherman syndrome and bicornuate uterus respectively. Out of 17 cases of secondary infertility 3 cases (17.6 %) showed uterine septum, fibroid was seen in 3 cases, polyp was seen in only one case and synchiea was seen in only 1 case.

In their study uterine factors were responsible for 18 % cases. In studies conducted by Nakade K D et al, Sorttey K D et al uterine factors were responsible for 12 %, 11 % respectively. Study by Godinjaz K Z et al 7.2 % cases had endometrial polyp, 5.2 % had anomalous uterus, 0.8 % had Asherman syndrome.

Out of all cases of primary infertility, 62 cases (74.7 %) showed bilateral spillage, 12 cases (14.5 %) showed unilateral spillage and 9 cases (10.8 %) showed no spillage. Out of secondary infertility 10 cases (58.8 %) showed bilateral spillage, 4 cases showed unilateral spillage and 2 cases showed no spillage. In a study by Samipa J. Shah et al (2014), chromopertubation test was done in all cases, 3 % showed bilateral tubal block and 13 % had unilateral tubal block. In another study by PK Nayak et al (2013), on chromopertubation they observed that 31 % patients showed complete bilateral tubal block while 30 % patients showed unilateral tubal block.

CONCLUSIONS

Diagnostic hysterosalpingolaparoscopy when used for infertility workup can detect anomalies of uterus, tubes & ovaries and also peritoneal endometriosis, and adnexal adhesions. It is safe, effective and time saving. Some correctable abnormalities that are unfortunately be missed by routine pelvic examination and usual imaging procedures can be detected. With proper selection of cases and when done by skilled surgeon can be considered as standard day care procedure for female infertility. It helps in formulating specific management plan. Hysteroalaparoscopy is also the gold standard for diagnosing and correcting uterine anomalies resulting in high pregnancy rates and take-home baby rates.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com. Financial or other competing interests: None. Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

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