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Original Research Article

A study on the organic causes of female infertility by diagnostic hysterolaparoscopy

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Abstract

Infertility is a common condition with important psychological, economic, medical and demographic implications. The prevalence of infertility ranges from 6.9% to 9.3% in developing countries. Female infertility can occur due to variety of causes, ranging from hormonal imbalance to congenital anomalies or infections or other pathologies involving uterus, FT, external genitalia or even error of coitus. Detailed history was taken, physical examination was done and relevant investigations were carried out. Cases requiring Hysterolaparoscopy were chosen. The latter procedure was carried out during the follicular phase of the menstrual cycle between days 5 and 10. Hysteroscopy revealed normal findings in 85.7% cases of primary infertility and 70% cases of secondary infertility. Abnormal findings noted Fibroid uterus, endometrial polyp, tubal ostial block, bicornuate uterus etc. On Laparoscopy Abnormal findings included PCOS, Ovarian cyst, Hydrosalpinx, Fimbrial abnormalities etc. On CPT, bilateral tubal block was seen in 18.4% cases and unilateral block in 10.5% cases. Combined Hysterolaparoscopy provides the best approach to diagnose organic causes of female infertility in cases who don‘t conceive following basic investigation and preliminary treatment. Endometrial biopsy is further helpful in management of some such cases.

Keywords: Female infertility, hysterolaparoscopy, endometrial biopsy

Introduction

According to World Health Organization, infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse [1]. There are two types of infertility-primary and secondary infertility [1].
Infertility is estimated to affect as many as 186 million people worldwide. Although infertility

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remains a woman's social burden. Unfortunately, areas of the world with the highest rates of infertility are often those with poor access to assisted reproductive techniques [2].

Infertility affects up to 15 percent of reproductive aged couples worldwide. According to WHO estimate, the overall prevalence of primary infertility in Indian population is between 3.9% to 16.8%. In Indian states, prevalence of infertility varies from state to state being 3.7% in Uttar Pradesh, Himachal Pradesh and Maharashtra [3], 5% in Andhra Pradesh [4] and 15% in Jammu and Kashmir [5]. Prevalence also varies in same region across tribes and castes [6, 7].

Normal fertility depends on various male and female factors. Tubal and peritoneal factors are responsible for 20-40% of causes of female infertility. These include tubal block, pelvic adhesions, endometriosis, Pelvic inflammatory disease and uterine abnormality. So, the assessment of tubal patency, peritoneal factors and uterine cavity are important in evaluation of infertility [8].

Laparoscopy is the gold standard diagnostic method in evaluation of tubal factors, ovarian factors, uterine and peritoneal disorders. All pelvic organs can be visualized directly by this method. Laparoscopy is also called as-Keyhole Surgery or Minimally invasive Surgery. Diagnostic laparoscopy is an important part of assessment of couples with infertility. It is the single procedure which gives maximum information in evaluation of female infertility. Abnormal findings of HSG are validated by direct visualization during laparoscopy. Laparoscopy has an advantage of careful assessment of the architecture of ovary, fallopian tubes and fimbriae. Abnormality detected in laparoscopy like ovarian cyst, Para ovarian cyst, tubal obstruction, endometriosis and pelvic adhesions can be treated at the same time.

Hysteroscopy is direct visualization of the uterine cavity with an endoscope and is the gold standard for evaluation of the endometrial cavity for complete infertility workup. Evaluation of the uterine cavity is essential. 10 to 15% of couples seeking infertility treatment have uterine abnormality, congenital or acquired. It is a minimally invasive procedure for diagnosis and treatment of intrauterine and endocervical pathology.

Procedures of laparoscopy and hysteroscopy can be combined at the same sitting to obtain more information during evaluation of infertility. When these two procedures are combined, they are labelled as hysterolaparoscopy. Hysterolaparoscopy has become an important tool in diagnosis and treatment of female infertility. If the clinical history, pelvic examination and basic diagnostic methods fail to diagnose a specific pathology, hysterolaparoscopy should be considered as it gives a definitive direction to the diagnosis and treatment of women with infertility. Both diagnostic and operative procedures can be done at the same time, so it avoids the need for a second surgery.

Methodology

Study setting

Department of Obstetrics and Gynecology.

Study design

Hospital based Cross sectional study.

Inclusion criteria

- Women willing to give consent for the study.
- Age group between 20-45 years.
- Women with primary infertility not responding to 3-6 cycles Ovulation induction drugs.
- Woman with secondary infertility.
- Women with local pelvic pathology such as endometriosis, fibroid uterus, endometrial polyps and uterine anomalies.

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Exclusion criteria

- Active pelvic/genital infection.
- Contraindication for laparoscopy like cardiac disease, hernia repairs.
- Active bleeding.

Sample size

Sample size was determined based on the following formula
n = 4pq/ d2
= 4 *71.6 *28.4 / (15*71.6/100)
= 70

Method of collection of data

- After clearance from IEC (Institutional Ethical Committee), a written, informed consent was taken from patient.
- Complete history was taken as per proforma, detailed physical examination was done. Investigations like Hemoglobin (Hb), Blood grouping (ABO & Rh), Random blood sugar (RBS), HIV, HbsAg, VDRL, Urine routine & Microscopy, Semen analysis, Pelvic Ultrasonography (USG), hysterosalpingography (HSG), Follicular stimulating hormone (FSH), luteinizing hormone (LH), Thyroid stimulating hormone (TSH) and Prolactin levels were done.
- Hysterolaparoscopy was carried out during the follicular phase of the menstrual cycle between days 5 and 10 along with endometrial biopsy.

Results

Table 1: Relation between Hysteroscopy findings and Type of infertility

Hysteroscopy findings	Type of infertility		Total
	Primary	Secondary	
Normal	24 (85.7%)	07 (70%)	31 (78.8%)
Abnormal	04 (14.3%)	03 (30%)	07 (21.2%)
Total	28 (100%)	10 (100%)	38 (100.0%)

Chi square value-1.21, p value-0.27

- Most of the cases exhibited normal findings. It was seen in 24 cases (85.7%) in primary infertility and 7 cases (70%) in secondary infertility.
- Association of hysteroscopy findings with the type of infertility was not statically significant (p value 0.27).

Table 2: Findings in Hysteroscopy

Hysteroscopy findings	Type of infertility		Total
	Primary	Secondary	
Polyps	00	01(10%)	01(02.6%)
Myoma	02 (07.2%)	00	02 (5.2%)
Cervical stenosis	01(03.6%)	00	01 (05.2%)
Tubal block	00	01(10%)	01 (02.6%)
Atrophic endometrium	01 (03.6%)	00	01 (02.6%)
Bicornuate uterus	00	01(10%)	01 (02.6%)

- Abnormal findings in primary infertility were Myoma, Atrophic endometrium and cervical stenosis.
- Abnormal findings in secondary infertility were polyp, tubal block and bicornuate uterus.

Table 3: Relation between Laparoscopy findings and Type of infertility

	Type of infertility		P value
	Primary	Secondary	
Uterus			
• Normal	23 (82.1%)	08 (80%)	0.87
• Abnormal	05 (17.9%)	02 (20%)	
Fallopian tube			
• Normal	25 (89.3%)	06 (60%)	0.04
• Abnormal	03 (10.7%)	04 (40%)	
Ovary			
• Normal	16 (57.1%)	06 (60%)	0.87
• Abnormal	12 (42.9%)	04 (40%)	
Peritoneum			
• Normal	24 (85.7%)	06 (60%)	0.08
• Abnormal	04 (14.3%)	04 (40%)	

- **Uterus:** Majority of the study cases of primary infertility (82.1%) and secondary infertility (80%) had normal findings. Abnormalities were noted in total 7 cases.
- **Fallopian tubes:** Most of study cases in primary infertility (89.3%) and in secondary infertility (60%) had normal findings. Abnormal findings found 7 cases. The observed difference between primary and secondary infertility was statistically significant (p value 0.04).
- **Ovaries:** Majority of the study cases of primary infertility (57.1%) and secondary infertility (60%) exhibited normal findings. Abnormalities were noted in 16 cases.
- **Peritoneum:** Majority of primary infertility cases (85.7%) had normal findings and 60% were found to be normal in secondary infertility group.

Table 4: Findings in Laparoscopy

Laparoscopic findings	Type of infertility	
	Primary	Secondary
Uterine anomaly	02 (07.1%)	01 (10%)
Myomas	03 (10.7%)	01 (10%)
PCOS	10 (35.7%)	02 (20%)
Ovarian cyst	02 (07.1%)	02 (20%)
Fimbrial abnormalities	01 (03.6%)	02 (20%)
Hydrosalpinx	02 (7.1%)	02 (20%)
Endometriosis	01(03.6%)	03 (30%)
Pelvic adhesions	04 (14.3%)	04 (40%)

- The most common abnormal laparoscopic finding in primary fertility cases was PCOS (35.7%) followed by pelvic adhesions (14.3%) and Myomas (10.7%).
- In Secondary fertility cases most common abnormal laparoscopic findings are pelvic adhesions (40%), followed by endometriosis (30%), Bulk ovaries (20%), Ovarian cyst (20%), Hydrosalpinx (20%), Fimbrial abnormalities (20%), Myomas (10%) and Uterine anomaly (10%).
- Observed differences of abnormal laparoscopic findings between primary and secondary fertility subjects are not statistically significant.

Discussion

Diagnostic hysteroscopy provides a good information in evaluation of uterine cavity and helps in detection of intrauterine diseases, endocervical pathology and gives information about ostia. It offers a safe diagnostic and therapeutic alternative in the same sitting. In the present study, most of the cases (78.8%) cases exhibited normal findings on hysteroscopy. The distribution in relation to type of infertility was 85.7% in Primary infertility and 70% in secondary infertility. Abnormal findings noted were Myoma, Polyp, Cervical stenosis, Bald endometrium, Ostial block and Bicornuate uterus. Godinjak Z *et al*. [9] found endometrial polyp in 7.22% cases, Sajida *et al*. [10] found uterine anomalies in 12.9%, Sandeep *et al*. [11] (2016) found cervical stenosis & Uterine anomaly in % cases, Erhong *et al*. [12] (2021) found polyps in 39.39% cases and Smita Barya [13] (2021) noted ostial block in 9% cases. Percentage of abnormal findings varied between various studies and also the type of abnormality.

Laparoscopy provides a magnified view of the pelvic organs. There is direct visualization of pelvic organs and operative procedures can be done at the same sitting. The major abnormal finding in the present study was Ovarian pathology ‘accounting for 36.84% cases. This was considerably more than the other studies. In study by Sandeep *et al*. [11] (2016) the major abnormal finding was Pelvic adhesion (40%), in study by Sairam *et al*. [14] (2018) It was Tubal pathology & Pelvic adhesions (20.45%) and in study by Samita Barya *et al*. [13], it was Tubal pathology (27%). In the present study, tubal pathology was the second common finding encountered (31.5%). This is comparable with the study done by Samita Barya *et al*. [13]. Pelvic adhesions were seen in 21.05% cases in the present study which is comparable with studies done by Sairam *et al*. [14] and Samita Barya *et al*. [13]. There was higher incidence of Endometriosis (10.52%) and Myomas (10.52%) in the present study when compared to other studies quoted.

Conclusion

Diagnostic hysterolaparoscopy can be performed as a day care procedure also. It helps in the diagnosis of various organic causes of infertility, which is not diagnosed by other investigations like hormonal study, USG and HSG. One can directly visualize various pelvic organs and take corrective measures at the same sitting. Thus, it can be used as 'One-time approach'.

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