

Role of Hysterolaparoscopy in Diagnosis and Management of InfertilityManju Yadav¹, Garima Sharma², Gaurav Sharma³, Anshu Sharma^{4*}¹Consultant, Department of Obstetrics and Gynaecology, Geetanjali Medical College, Udaipur, Rajasthan²Assistant Professor, Department of Obstetrics & Gynaecology, Siddhi Vinayak Hospital, Chomu, Jaipur, Rajasthan³Associate Professor, Department of Medicine, Geetanjali Medical College, Udaipur, Rajasthan⁴Associate Professor, Department of Orthopaedics, Geetanjali Medical College, Udaipur, Rajasthan

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Abstract:**Aims and Objectives:** The present study was planned with the aim to evaluate the role of hystero- laparoscopy for identifying the various pathological conditions, to develop a plan of treatment and to analyze the rate of complications.**Material and Methods:** 100 cases with complain of infertility attending the OPD of obstetrics and gynaecology Mahatma Gandhi hospital. All infertile patients with primary and secondary infertility of age group 18-40 years.**Results:** 75 cases (75%) were of primary infertility and 25 cases (25%) were of secondary infertility. In my study most common factor was tubal factor. In many cases, there were more than one factor. Therefore no of findings were more than number of cases taken. However inspite of thorough laparoscopic evaluation no cause was revealed in 20 cases (20%) and were included under unexplained infertility.**Conclusion:** We concluded that Laparoscopy and hysteroscopy combined together are valuable technique for complete assessment of female factors of infertility patient and should be used early in the diagnostic work up in cases of infertility.**Keywords:** Primary And Secondary Infertility, Hysteroscopy, Laparoscopy.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

According to WHO Infertility is defined as “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.”[1] According to ASRM it can also be defined as failure of couple to conceive after 12 months of regular intercourse without the use of contraception in women <35 years; and after 6 months of regular intercourse without the use of contraception in women ≥35 years. [2]

The prevalence of infertility ranges from 3.5% to 16.7% in more developed nations and from 6.9% to 9.3% in less developed nations, with an estimated overall median prevalence of 9%. According to the World Health Organization one in every four couples in developing countries had been affected by infertility. [3]

Infertility is divided into primary and secondary. Primary Infertility defined as inability to conceive. Secondary Infertility: When a woman is unable to bear a child following either a previous pregnancy or a previous ability to carry a pregnancy to live birth. Infertility can be due to female, male or both factors. The female factors contribute most 40-55%

in the etiologies of infertility followed by male factors 30- 40% and both partners are involved in 10% cases and another 10% cause is unexplained. Female infertility accounts for 40-55% of which ovulatory dysfunction is 40%, tubal and pelvic pathology is 40%, uterine and cervical factors 10%, unexplained 10%. [4,5]

Ovulatory disorder are responsible for 40% cases of infertility. Among them PCOS is the most common cause. Apart from PCOS other causes are diminished ovarian reserve, advanced maternal age, stress, thyroid dysfunction, premature ovarian failure, hyperprolactinemia, extreme weight loss and gain.

Tubal factor found in nearly 30% case which include - tubal damage or blocked due to pelvic inflammatory disease (gonorrhoea, chlamydia and sexually transmitted disease), previous surgery for ectopic pregnancy, endometriosis and septic abortion. Factors causing high rates of tubal infertility in developing world include sexually transmitted, postpartum and postabortion infections.[6]

Uterine/cervical factors are present in more than 10% case and decrease fertility by interfering with implantation or increase miscarriage such as - congenital uterine anomaly, fibroids, polyps, poor cervical mucus quantity/quality, uterine synechiae. Among uterine anomalies septate uterus is the most common anomaly that cause reproductive failure

HSG is useful to detect tubal patency and abnormalities of uterine cavity such as submucous fibroid, T-shaped cavity, polyp, synechiae and mullerian anomalies. However it cannot diagnose peritubal adhesion, endometriosis and motility of tube. It gives 15-20% false positive result. High specificity of HSG for diagnosis of tubal occlusion and low sensitivity in cases with peri-tubal adhesions. [7]

Ultrasound (USG) can reveal about ovulation, uterine fibroids, endometrial polyps, ovarian cysts, adnexal masses, and endometriomas and PCOS. Limitations are limited field of view, subjective errors, interference by obesity or by gaseous bowel loops, suboptimal visualization of fallopian tubes and broad ligament, failure to delineate small ovaries, and inability to obtain images in the surgical plane. [8]

Routine pelvic examinations and the usual diagnostic procedures often fail to correctly diagnose the majority of pelvic pathology in infertile women.

Hysterolaparoscopy is one of the newer and advance technique which is used in management of infertility. Laparoscopy and hysteroscopy are used for both diagnostic and therapeutic purposes. Hysteroscopy is equally important modality to detect uterine anomalies and other intrauterine pathologies. It involves direct visualisation of uterine cavity. It has high sensitivity and specificity for diagnosis. With operative hysteroscopy we can simultaneously treat the conditions like polypectomy, septum resection, adhesiolysis, tubal cannulation and removal of submucous fibroid. [9]

The present study was planned with the aim to evaluate the role of hystero- laparoscopy for identifying the various pathological conditions, to develop a plan of treatment and to analyze the rate of complications.

Material and Methods

The prospective study was carried out in the Department of Obstetrics and gynecology, Mahatma Gandhi Medical College & Hospital, Jaipur.

Inclusion Criteria: All infertile patients with primary and secondary infertility of age group 18-40 years

Exclusion Criteria:

- 1) Male factor abnormalities
- 2) Sever medical problems like respiratory illness, cardiac disease, diabetes, Psychiatric illness, liver disorder and any other systemic illness.

After the enrollment, demographic data such as age, religion, education, socioeconomic status were obtained through an interview. Detailed history including complaints, duration of married life, obstetric history, sexual, menstrual, occupational history, medical and drug allergy history was documented and general examination followed by systemic examination followed by per speculum and per vaginal examination was performed. Investigations like haemogram, blood sugar, HIV, Hbs antigen, VDRL, urine routine test, liver and kidney function tests, Montoux test, chest X-ray were done. Specific investigations like Semen analysis were done to rule out the male factors of infertility, along with hormonal study (S.LH, FSH, Prolactin, and TSH) and pelvic ultrasound were done. These findings were recorded on a predesigned proforma

Methods

After written consent Hysterolaparoscopy was performed in the pre-ovulatory period between days 6-10 of the cycle for infertility evaluation under general anesthesia after the opinion of the anesthetist. Cervix was held with vassellum and 2.9mm hysteroscope introduced. Uterine cavity is distended with normal saline .On hysteroscopy, endocervical canal was visualized for any growth or polyps than uterine cavity was examined for the presence of septum, any congenital malformation, fibrous bands, polyps, myomas, endometrial appearance, thickness and color. Both the tubal ostia were visualized. Hysteroscopy polypectomy, septum resection, adhesiolysis and endometrial curettage was done as needed.

After hysteroscopy laparoscopy was done. Below umbilicus a small incision was given and Veeres needle inserted for creating pneumoperitoneum than 10mm trochar was inserted. After that 0 degree Laparoscope inserted for diagnostic laparoscopy of abdominal cavity and pelvic. During this procedure a careful evaluation of the fallopian tubes, ovaries, pelvic peritoneum, pouch of Douglas and peritoneal cavity was done. Uterus was inspected for its shape, size, position and surface. Cul-de-sac was examined for any adhesions, obliteration, endometriotic nodules or fluid. Ovaries were viewed for size, shape, surface, color, presence of cysts and relation with tubes. Fallopian tubes were inspected carefully for size, shape, surface, kinking, dilatation, stricture or hydrosalpinx. The features suggestive of infertility

were looked for. Ancillary ports were created for surgical interventions like adhesiolysis, tubal cannulation, ovarian drilling, fulgration of endometriotic lesions, cyst excision during laparoscopy. Laparoscopic chromopertubation was performed for testing tubal patency in which methylene blue dye was injected with a 20ml syringe via Leech Wilkinson cannula and spillage of dye from the fimbrial end of tube visualized.

After the procedure, patient was transferred to postoperative ward and was discharged next day.

Statistical analysis was performed with the SPSS, Trial version 23 for Windows statistical software package (SPSS inc., Chicago, IL, USA) and Primer. The Categorical data were presented as numbers (percent) and were compared among groups using Chi square test. Quantitative data were presented as mean and standard deviation. Probability P value <0.05 was considered statistically significant.

Results

A prospective study consisting of 100 infertility patients, both primary and secondary is undertaken to know the role of hysterolaparoscopy in the evaluation of infertility.

In the present study 30% of women belonged to the age group of 21-25 years, 49% belonged to the age group of 26-30 years, 18% belonged to the age group of 31- 35 years, 3% women belonged to age group of more than 35 years of age.

In the present study, 75 cases (75%) were of primary infertility and 25 cases (25%) were of secondary infertility (table 1).

In the present study majority of patients in both groups had a duration of infertility 1-5 years. 70% patients had duration of infertility between 1-5 years, 23%

had between 6-10 years, 5% patients had duration between 11-15 years and 2% patients had duration more than 15 years (table 2)

In the present study according to the history taken from patients 67% cases had regular menstruation, 33% patients had irregular menstruation out of which 18% patients had oligomenorrhea, 5% patients had polymenorrhea, 10% patients had menorrhagia (table 3)

In the present study all the women had done ultrasound 69 cases were detected with no abnormality, while 8 cases were found to have polycystic ovaries, 6 cases had fibroid, 7 cases had cyst, 2 cases had bicornuate uterus, 3 cases had hydrosalpinx (table 4)

In the present 84% patients had no abnormal finding, 3% cases were found to have septum and synechiae respectively, 2% had bicornuate uterus, 1% had hypoplastic uterus, 4% had polyp, 2% U/L cornual block and 1% submucous fibroid. Polyp were most common found in primary infertility and adhesion were most common in secondary infertility (table 5)

26 cases of infertility in our study accounted for ovarian factors. Most common was polycystic ovaries in 12 cases. Of the 7 cases of ovarian cysts (1 dermoid cyst, 6 simple ovarian cyst) chocolate cyst in 3 cases and 5 cases had TO mass (table 6)

In our study, tubal factors were responsible for 38.67% of primary and 32% of secondary infertility patients. Overall 37 cases were found to have tubal factor as a cause of infertility. Out of 100 cases, 19 cases had bilateral and 12 cases had unilateral block. 5 cases of hydrosalpinx (2 case had bilateral and 3 had unilateral hydrosalpinx). 5 cases had peritubal adhesion (2 cases of peritubal adhesion associated with bilateral block and 3 cases of isolated peritubal adhesion). *Out of 37 cases, 4 cases had more than one tubal factor (table 7)

Peritoneal factors accounted for 21% of infertility cases. Pelvic endometriosis was found in a total of 7 cases. Tubercles was found in 4 cases. Adhesion including peritubal were found in 10 cases (table 8)

Table No. 1: Distribution of the Cases according to Type of Infertility

Type of Infertility	No.	%
Primary	75	75
Secondary	25	25
Total	100	100

Table 2: Distribution of Cases according to the Duration of Infertility (year)

	Primary		Secondary		Total	
	No.	%	No.	%	No.	%
1 to 5	55	73.33	15	60.00	70	70.00
6 to 10	14	18.67	9	36.00	23	23.00
11 to 15	4	5.33	1	4.00	5	5.00
16 to 20	2	2.66	0	0.00	2	2.00
Total	75	100.00	25	100.00	100	100.00

Table 3: Distribution of Cases according to Menstrual History

	Primary		Secondary		Total	
	No.	%	No.	%	No.	%
Menorrhagia	8	10.67	2	8.00	10	10.00
Oligomenorrhea	16	21.33	2	8.00	18	18.00
Polymenorrhea	3	4.00	2	8.00	5	5.00
Regular	48	64.00	19	76.00	67	67.00

Table 4: Distribution of Cases according to Ultrasound Findings

	Primary		Secondary		Total
	No.	%	No.	%	No.
Bicornuate	1	1.33	1	4	2
Hydrosalpinx	1	1.33	2	8	3
Intramural Fibroid	1	1.33	0	0	1
Ovarian Cyst	6	8.00	2	8	6
PCOD	6	8.00	2	8	8
Simple Cyst	1	1.33	0	0	1
Subserosal Fibroid	3	4.00	2	8	5
Tuboovarian Mass	2	2.67	1	4	3
Normal	54	72.00	15	60	69

Table 5: Distribution of Cases according to Hysteroscopy Findings

	Primary		Secondary		Total	
	No.	%	No.	%	No.	%
Adhesion	0	0.00	3	12.00	3	3.00
Bicornuate uterus	1	1.33	1	4.00	2	2.00
Cornual Block	2	2.67	0	0.00	2	2.00
Hypoplastic Uterus	1	1.33		0.00	1	1.00
Polyp	3	4.00	1	4.00	4	4.00
Septum	1	1.33	2	8.00	3	3.00
Submucous Fibroid	1	1.33	0	0.00	1	1.00
Normal	66	88.00	18	72.00	84	84.00
Total	75	100.00	25	100.00	100	100.0

Table 6: Distribution of the Cases according to Ovarian Factors

	Primary		Secondary		Total
	No.	%	No.	%	No.
Ovarian Factors	21	28.00	5	20	26
PCO	10	13.33	2	8	12
Ovarian cyst	6	8.00	1	4	7
Endometrioma	2	2.67	1	4	3
TO Mass	4	5.33	1	4	5

Table 7: Distribution of the Cases according to Tubal Factors

	Primary		Secondary		Total
	No.	%	No.	%	No.
Tubal Factors	29	38.67	8	32	37
Bilateral Block	15	20.00	4	16	19
Hydrosalpinx	3	4.00	2	8	5
Unilateral Block	10	13.33	2	8	12
Peritubal Adhesion	4	5.33	1	4	5
*Multiple Factors					

Table 8: Distribution of the Cases according to Peritoneal Factors

	Primary		Secondary		Total
	No.	%	No.	%	No.
Peritoneal Factors	17	22.66	4	16	21
Endometriosis	6	8.00	1	4	7
Adhesion	8	10.66	2	8	10
TB/tubercles	3	4.00	1	4	4

Discussion

Infertility is a gradually rising medical and social problem that affects a large proportion of the world's young reproductive age population (10-15%). Inability to conceive a child poses great psychosocial and emotional stress to the couple facing this problem. A large proportion of the developing country has limited access for medical treatment for infertility. The prevalence and etiology of infertility varies from place to place. Generally infertility is a multifactorial condition. In this modern era with newer technology, hysterolaparoscopy provides excellent diagnostic and therapeutic tool for management of infertile patient. It is specially valuable for those couples who underwent so many investigation and treatment without any conclusion and result. Therefore in the present study, all the couples, after thorough history and physical examination, were subjected to hysterolaparoscopy. [10]

In our study hysterolaparoscopy was performed on 100 cases, among them 75% cases of primary infertility and 25% of secondary infertility, which correlates with the study conducted by Mehta AV et al (2016), [11] who found 69% cases of primary and 31% cases of secondary infertility. In the study conducted by Sandeep S et al (2016) also found similar result, as 78.82% cases of primary infertility and 21.17% cases of secondary infertility [12]

In the present study 49% cases occur in the age group of 26- 30 years and among them 77% cases were of primary infertility and 22% cases of secondary infertility. 30% cases were found in 21-25 years age group and among them 76% cases of primary infertility and 23% cases with secondary infertility. Shetty SK et al (2013) who also found that 36% cases were detected in the age group of 26-30 years [13]

In present study, 73% cases with primary infertility and 60% cases with secondary infertility had duration of infertility between 1-5 years and this was similar to the observation of Agarwal et al (2014), who found 75% cases with primary and 60.7% cases with secondary infertility had a duration between 1-5 years [14]

In our study 33 cases had menstrual problem. Most common was oligomenorrhoea in 18% cases, menorrhagia in 10% cases and polymenorrhoea in 5% cases. Whereas in study conducted by Shobha D et al (2014) showed 74% of the women had regular cycles while 26% of the women reported irregular menstrual history and oligomenorrhoea was the most common cause.[15]

In present study out of 100 patients laparoscopy detect 7% abnormalities. Among them 4 cases of fibroid, 2 cases of bicornuate, 1 cases of

hypoplastic uterus. Combined uterine factor infertility on hysteroscopy and laparoscopy was found 17% in our study which were comparable to studies conducted by Sachdeva PK et al (2016) who found uterine factor in 20% cases, Nalini et al (2014) also found that 23% cases of uterine factors that are responsible for infertility [16,17]

In our study 37 cases were found to have tubal factor as a cause of infertility. Out of 100 cases 19% had bilateral block, 12% cases with unilateral block, 5% cases with hydrosalpinx in (3 unilateral and 2 bilateral hydrosalpinx) and 5% cases with peritubal adhesion. Our result was comparable with Begum J et al (2015) who found 40% cases with tubal factors of infertility. Out of them 28% case had bilateral block, 11.8% cases had unilateral block and 5.9% cases had adhesion [18]

In our study 26 cases were found to have ovarian factors as a cause of infertility. Out of 100 cases Polycystic ovaries (PCO) was most common seen in 12% cases followed by ovarian cyst in 7% cases, endometrioma in 3% case and tuboovarian mass (TO mass) in 5% cases. In the study conducted by Sachdeva PK et al (2016) [16] found that ovarian factor responsible for infertility in 29% cases included 14% patients with PCOD, 6% with ovarian cysts, 3% with streak ovaries and 6% with enlarged ovaries

Our results correlate with Aziz N (2010) [19] who found PCO in 10% case, ovarian cyst in 4% cases. Sharma et al (2016) [20] conducted study on 100 patients and found 18% cases of PCOS, 2% cases of endometrioma, 1% cases of ovarian cyst and TO mass in 7% cases so total ovarian factors responsible for infertility was 28%.

Chakarborti et al (1990) [21] also found that 11.4% cases of PCOS, 8% cases of ovarian cyst and TO mass in 7.2% cases so total ovarian factors resulted infertility was 27.1%. Polycystic Ovarian Disease (PCOD) is one of the leading cause of female infertility. The prevalence of PCOD in infertility in an asymptomatic woman is found to be between 16% and 33%.

In our study endometriotic spots were found in 7% cases and were comparable to studies done by Mali K et al (2016) [23] who found 12% cases of endometriosis and Naz T et al (2009) also found 10.9% cases. [24]

Tuberculosis is another important cause of infertility. Genital tuberculosis was found in 4% cases in our study which was similar to Chaudhry P et al (2016) [25] who found 2% cases of tuberculosis, It is the most common cause of infertility in India and its incidence is almost 3.2 to 6.2% affecting fertility. [26] It not only causes tubal obstruction and dysfunction but also impairs implantation due to endometrial involvement. [27]

Biopsy was taken and sent for histopathological examination for confirmation of tuberculosis

In our study out of 100 patients unexplained infertility was found in 20% cases more in primary infertility compared to secondary infertility which was similar to others studies Samal S et al (2014), 18%, Daddanavar AV et al (2016) 16%, and Jani RS et al (2014) 14%. [28,29,30]

In our study 4% complications occurred during procedure. Most common of these was pain and abdominal discomfort, similarly study conducted by Mehta AV et al (2016) [31] was found 9% patients developed minor complications, of which gaseous distension of the abdomen was the most common. There was no major surgical or anaesthetic complication in any of the patients.

Conclusion

Hence we concluded that Laparoscopy and hysteroscopy combined together are valuable technique for complete assessment of female factors of infertility patient and should be used early in the diagnostic work up in cases of infertility.

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