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Role of Diagnostic Hysterolaparoscopy in Primary Infertility

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Abstract: ***In developing countries like India, although population explosion is a major problem, infertility appears to be increased about 20%. In evaluation of infertility, evaluation is not complete without diagnostic hysterolaproscopy. Because it provides direct visualization of pelvis. So we can assess the severity of all problems by this method. Objective: To find out the role of combined laparoscopy and simulatenous hysteroscopy in evaluation of primary infertility. Methods: Primary infertile women attending Obstetrics and Gynaecology department for female factor evaluation, by laparoscopy and simultaneous hysteroscopy. Observation of pelvic and intrauterine cavity as well as chromoperubation also done under general anaesthesia during diagnostic hysterolaparoscopy. Result: A total of 50 women underwent combined hysteroscopy and simultaneous laparoscopy. Age ranged from 21 to 40.In hysteroscopy 8% had submucous fibroids, 6% had endometrial polyp, 2% had endometriotic spots, 2% had intrauterine adhesions, 2% had cervical stenosis, 2% had intrauterine septum 74%of patient had normal hysteroscopic findings. In laparoscopy, 14% patient had uterine pathology, in which 4% had subserous fibroid, 2% had endometriotic spots, 4% anomalous uterus like bicornuate uterus 2% and hypoplastic uterus (2%), 2% had peritubal adhesions. 18% patient had abnormal tubal factors, like 10% had hydrosalphinx, in which 6% had bilateral and 4% had unilateral pathology.Tubal adhesions was seen in 4% patients. In 50 patients 40% had ovarian pathology, in which PCOD (26%) is the most common, followed by bilateral endometrioma (4%), unilateral endometrioma in 4%. 26% patient had peritoneal pathology of which 10% had endometriosis, 8% had adhesions. Conclusion: In evaluation of the causes of primary infertility, a combined laparoscopy and simultaneous hysteroscopy provides a best approach to diagnose the pathologies.***

Keywords: Laparoscopy, Hysteroscopy, Infertility

1. Introduction

One of the most important health problem in developing countries is infertility .Infertility is defined as one year of unprotected intercourse without pregnancy. Primary infertility in which there is no previous pregnancies. Secondary infertility in which at least one previous conception has taken place irrespective of the outcome of pregnancy. For normal couple – 20-25% per cycle so based on this estimation 50% couples should conceive after 3-4 months, 95% after 12 months. It provides the clinical rule that 12 months of unprotected intercourse may define fertility problem.

Incidence of infertility is now increased around 20% due to increasing risk factors like obesity, food & life style modifications, and greater number of women's attempting pregnancy at older ages when they are less biologically fertile. Infertility depends upon both male and female factors.

Cause of Female Infertility

Ovarian factor -	40%
Tubal and pelvic factors	40%
Unexplained factor	10%
Unusual problems	10%

Pelvic abnormalities among infertile patients is frequently not appreciated by pelvic examination and usual diagnostic studies. For this reason direct endoscopic technique has provided the complete evaluation in infertile women. The overall incidence of infertility has remained relatively unchanged over the past 3 decades. But, the evaluation and treatment of infertility have changed dramatically during that time.Infertile couples are now more likely to seek medical advice, evaluation and treatment.

The overall decrease in fertility rate due to

a) Greater interest in advanced education among women.
b) Late marriage and more frequent divorce
c) Improvement in contraception and family planning services
d) Delayed child bearing
e) Decreased family size.

Various data and studies suggest that fertility in women peaks between the ages of 20 and 24 decreased relatively until the age 30-32, and then declines progressively

Aims and Objectives

To evaluate the role of diagnostic hysterolaparoscopy in female infertility.

2. Materials and Methods

This is a prospective study done at Department of Obstetrics and Gynecology, Coimbatore Medical College and Hospital from August 2014-July 2015.Ethical Approval for the Sstudy was obtained from Hospital Ethical Committee prior to commencement of study.50 primary infertile women of age between 21-40 YEARS attending GYNECOLOGICAL OPD for female factor evaluation, were included in this study after obtaining informed consent for Combined Diagnostic Hysterolaparoscopy.

Inclusion Criteria

- Primary infertility
- Women with failed induction for minimum of 3 cycles

Exclusion criteria

- Secondary infertility
- Malefactor
- Age > 40yrs
- Active pelvic infection
- Contraindications to general anesthesia

While evaluating feamle factors, the following particulars obtained from history. Evaluation should be offered to all couples who have failed to conceive after a year of unprotected intercourse

Evaluation of Female Factors

History

- Menstural cycle length and characteristics
- Coital frequency, sexual dysfunction
- Duration of infertility and results of any previous evaluation and treatment
- Past history of any surgery or medical illness
- Occupation and use of tobacco, alcohol, drugs
- Symptoms of thyroid disease,
- Pelvic, abdominal pain
- Galactorrhea, hirsuitism, and dyspareunia

Gynecological Examination

Weight, BMI, Thyroid, Breast examination

Abdominal examination - pelvic or abdominal tenderness, organs enlargement or mass

Per speculum – vaginal or cervical abnormalities and any secretions or discharge.

Bimanual examination – any tenderness, mass or nodularity in the adnexa or cul de sac.

Baseline Investigations

USG, SEROLOGY.

Hormonal assay-DAY2/DAY3, FSH, LH, PROLACTIN levels and SEMEN ANALYSIS were done.

After excluding male factors, patients were posted for DIAGNOSTIC HYSTEROLAPAROSCOPY in the preovulatory period.

3. Observation and Results

Table: Age distribution

Age	Frequency	Valid Percent	Cumulative Percent	
20 to 25 yrs	11	22.0	22.0	22.0
26 to 30 yrs	30	60.0	60.0	82.0
31 to 35 yrs	9	18.0	18.0	100.0
Total	50	100.0	100.0	

In the present study, the most common age group was between 26-30 years, and followed BY age group between 20-25 years then 31-35 years.

Table: Duration of infertility

Duration	Frequency	Percent	Valid Percent	Cumulative Percent
1-3 yrs	9	18	18	18
4-6 yrs	27	54	54	72
7-9 yrs	9	18	18	90
10-12 yrs	2	4	4	94
13-15 yrs	2	4	4	98
16-18 yrs	1	2	2	100
Total	50	100	100	

Duration of infertility in majority of the patients (27%) was between 4-6 year.

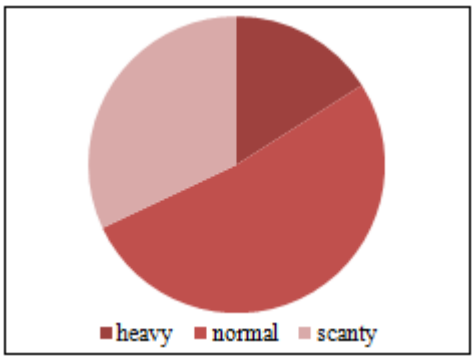
Table: Regularity of cycles

	Frequency	Percent	Valid Percent	Cumulative Percent
Irregular	15	30	30	30
Regular	35	70	70	100
Total	50	100	100	

70% of people have normal regular cycles and only 30% have irregular cycles

Table: Cycle pattern

	Frequency	Percent	Valid Percent	Cumulative Percent
Heavy	8	16	16	16
Normal	26	52	52	68
Scanty	16	32	32	100
Total	50	100	100	



In cycle pattern, 52% had normal flow and 32% had scanty and 16% had heavy flow.

Table: Past history

	Frequency	Percent	Valid Percent	Cumulative Percent
CC	4	8	8	8
NIL	44	88	88	96
TB	2	4	4	100
Total	50	100	100	

Past History: Only 2 patients had history of TB, and 4 patients had history of taking clomiphene citrate for induction.

Table: Hysteroscpic findings

	Frequency	Percent	Valid Percent	Cumulative Percent
Adenomyosis	2	4	4	4
cervical stenosis	1	2	2	6
Endometrial polyp	3	6	6	12
Endometriotic spots	1	2	2	14
Intrauterine adhesions	1	2	2	16
Normal	37	74	74	90
submucous fibroid	4	8	8	98
uterine septum	1	2	2	100
Total	50	100	100	

In Hysteroscopy, 37 (74%) patients had normal cavity. 3 patient had endometrial polyp, 2 had adenomyosis. 4 had submucous fibroids 1 patient had en dometriosis and one had IUA, other one patient had uterine septum.

Table: Laparoscopy-uterine factors

	Frequency	Percent	Valid Percent	Cumulative Percent
Adherent to the POD	1	2	2	2
Endometriotic spots	1	2	2	4
Hypoplastic uterus	1	2	2	6
L unicornuate,	1	2	2	8
R-Rudimentory				
Normal	43	86	86	94
Perihepatic adhesions	1	2	2	96
Subserous fibroid	2	4	4	100
Total	50	100	100	

86% of study group had normal finding. Only 4 % had subserous fibroid. In other patients one had perihapatic adhesion, another one had bicornuate uterus, and one patient had hypoplastic uterus. One patient uterus was adherent to POD.

Table: Laparoscopy-ovarian factors

	Frequency	Percent	Valid Percent	Cumulative Percent
L-TO mass	1	2	2	2
B/L Endometrioma	2	4	4	6
B/L PCOD	13	26	26	32
U/L-Endometrioma	2	4	4	36
Normal	30	60	60	96
U/LFunctional cyst	2	4	4	100
Total	50	100	100	

60% patient had normal ovaries. In ovarian pathologies, PCOD is the most common, its around 26% .4% had bilateralendometrioma, 2% had unilateral endometrioma.

Table: Laparoscopy-tubal factors

	Frequency	Percent	Valid Percent	Cumulative Percent
B/L Hydrosalphinx	3	6	6	6
L –Hydrosalphinx	2	4	4	10
L tube adherent to	1	2	2	12
the POD				
Normal	41	82	82	94
Peritubal adhesions	1	2	2	96
R-medial blind	1	2	2	98
end.L-TO mass				
R-tubal adhesions	1	2	2	100
Total	50	100	100	

82% patient had normal tubes. 5 patients (10%) had hydrosalphinx, out of these 6% had bilateral hydrosalphinx and 4% had unilateral.

Table: Laparoscopy-peritoneal factors

	Frequency	Percent	Valid Percent	Cumulative Percent
Adhesions	4	8	8	8
Endometriosis	5	10	10	18
Obliteration of POD	4	8	8	26
Normal	37	74	74	100
Total	50	100	100	

Out of 50 patients, 13 patients had abnormal findings. 5 had endometriosis, 4 (8%) had adhesions 4 (8%) had obliteration of POD

Table: Tubal patency test

	Frequency	Percent	Valid Percent	Cumulative Percent
B/L –VE	5	10	10	10
B/L +VE	40	80	80	90
U/L-VE	5	10	10	100
Total	50	100	100	

In chromopertubation test 40 patients (80%) had bilateral spillage positive. 5 patients (10%) had unilateral tubal block, 5 patients (10%) had bilateral tubal block.

Table: Laparoscopic findings

	Frequency	Percent
Uterus	7	14%
Tubes	10	20%
Ovaries	20	40%
Peritoneum	13	26%

Out of 50 patients 20 (40%) had ovarian pathology, 13 (26%) had peritoneal pathology and 10 (20%) had tubal pathology in 7 (14%) had uterine pathology.

4. Discussion

The development of advanced endoscopic instruments in recent years has demonstrated the superiority of direct visualization over radiographic examination of various body cavities.Diagnostic laparoscopy is the standard means of diagnosing the tubal pathology, peritoneal factors, endometriosis and intra abdominal causes of infertility. Diagnostic hysteroscopy offers a reliable evaluation of the endocervical canal, uterine cavity, endometrium, both tubal ostia and subsequent detection in intrauterine disease.

Cumming and Taylor in their studies argue that hysterosalphingography does not provide accurate evaluation as hysteroscopy for the detection of intrauterine lesions in infertile patients.

Age Group

An important factor that has to be considered in the investigation and the management of infertility is the age of patient. The reduction in fertility and fecundity with advancing age has been well documented. Overall fertility rates 4-8% lower in female aged 25-29, 15-19% lower between 30-34, 24-46% lower in women aged 35-39 and as much as 95% lower between ages 40-45

Comparison study of duration of infertility

Duration of in Fertility

	Boricha Y.G. et al (2011)	Present Study
3-Jan	-	18%
6-Apr	54%	54%
9-Jul	-	18%
> 10 years	-	10%

In 50 cases, maximum number of cases had duration of infertility of 4-6 years (54%). It is comparable with Brochia et al study group Dor et al conducted the study of duration of infertility. In his study maximum patients falls in duration of 1-5 years (67.5%)

Table 16: Comparision of hysteroscopy findings

Hysteroscopic Findings			
	Godinjak .Z	Shakya et al	Present
Endometrial Polyp	7.20%	6%	6%
Cervical Stenosis	-	-	2%
Submucous fibroids	-	2%	8%
Anomalous uterus	5.20%	4%	2%
Hypo plastic uterus	-	-	2%
Asherman's Syndrome	0.80%	-	2%

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 a study conducted by Godinjak Z et al 7.2% patients had endometrial polyp, 5.2% had anomalous uterus, 0.8% had Asherman syndrome.

Table 17: Comparison of Uterine factors

Uterine Factors			
Factor	Nakade K D et al	Sortey K D et al	Present Study
Uterine Factor	12	11	18%

In the present study uterine factors were responsible for 18% cases. In studies conducted by Nakade K D et al, sortey K D et al uterine factors were responsible for 12%, 11% respectively.

Table 18: Comparison of tubal factors

Tubal Factors				
Factor	Chakraborti et al	Bhide A G et al	Chitrakumari et al	Present Study
B/L Tubal Block	17.7	12.6	20.5	10%
U/L Tubal Block	5	10.2	8.9	10%
Peritubal Adhesions	-	-	7.6	2%
Hydrosalphinx	9.2	-	-	10%
Tubo Ovarian Mass	7.2	14	-	2%

Above tables shows various studies conducted by Chakraborti et al, BhideA G et al, Chitrakumari et al on tubal factors. In our study tubal factors responsible for 34% of infertility cases, which correlates with other studies.

Table 19: Comparision of ovarian factors

Ovarian Factors Infertility			
Factor	Bhide A G et al	Chakraborti et al	Present Study
PCOD	3.9	11.4	26%
Ovarian Cyst	5.3	8	4%
Streak Ovaries	0.8	-	-

Out of 50 patients, 60% had normal ovaries, only 40% had abnormal findings, in which most common is PCOD in 26%, next endometrioma in 8% patients, functional ovarian cyst seen in 4% of patients

Table 20: Comparison of peritoneal factors

Peritoneal Factors			
Factor	Sharma et al	Hutchin et al	Present Study
Endometriosis	6.6	-	10%
Pelvic adhesions	-	27.7	8%

5. Summary

The present study evaluated 50 patients of infertility following the inclusion and exclusion criteria by diagnostic hysterolaparoscopy at Coimbatore Medical College Hospital, Coimbatore.

Complete information on status of patient's reproductive tract is obtained. Both proximal and distal tubal pathology can be detected at the same setting.

It minimizes the hospital stay and decreases cost and reduces the surgical and anaesthetic risks to the patient. Proximal and distal tubal pathology can be detected at the same setting.

Hysterolaparoscopy is a feasible and acceptable procedure and it can be used as "ONE TIME APPROACH" in the assessment of female infertility caused due to pelvic pathology, helps in diagnosing of certain factors causing infertility, which cannot be diagnosed by any other method such as by USG, HSG and reveals when the surgery is possible and if so the nature of surgery most suited for the patient. It is concluded that while investigating the causes of female infertility combined simultaneous diagnostic laparoscopy and hysteroscopy should be performed in all infertile patients before treatment, especially in women with age more than 30years. Many diagnostic tests for female infertility have screening value but the gold standards are laparoscopy and simultaneous hysteroscopy.

Though HSG may be economical and may not require the theatre facility and trained endoscopist, the high incidence of false positive and false negative tubal studies, lack of specificity in diagnosing intrauterine pathology along with the risk of avoidable radiation to the infertile women, precludes its routine use wherever hysteroscopy, laparoscopy and trained endoscopist are available.

Hysteroscopy offers safe, direct and accurate diagnosis of intrauterine lesions, low failure rate and decreased complication rates.

Hysteroscopy allows diagnosis of small abnormalities not evident on HSG and also artefacts of HSG is avoided when hysteroscopy is used. It provides the opportunity not only to visualise the abnormalities but also to correct in many cases.

Laparoscopy aids in visualization of peritoneal, tubal & ovarian factors of infertility. In the same sitting diagnosis and corrective surgery can be done.

Laparoscopy is of value in detecting previously unsuspected tubal disease, hysteroscopy adds further information in the management of infertile patient for optimal evaluation, an approach using Hysteroscopy & Laparoscopy is recommended, especially in patients with a history of uterotubal and peritoneal lesions.

6. Conclusion

In this prospective study of 50 patients of infertility, diagnostic hysterolaparoscopy was found to be useful in the following aspects.

Presences of peritoneal factors, tubal and endometrial factors were diagnosed in the same sitting thereby improving the efficacy of infertility evaluation. It avoids unnecessary radiological evaluation in a majority of cases. It decreases hospital stay and decreases costs and inconvenience to the patients. It also decreases the time required to complete the infertility work up. Majority of patients with abnormalities as a probable cause of infertility were diagnosed in this study.

This procedure is also helpful in carrying out further required therapeutic procedures. Hence it can be concluded that diagnostic hysterolaparoscopy is invaluable in routine infertility work up.

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