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Role of combined hysterolaparoscopy for the diagnosis of female infertility in tertiary care centre

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Abstract
Background: Infertility, one of the most common disorders confronting gynaecologist, has multifactorial etiology and none of the laboratory findings alone is conclusive in diagnosis. Combined diagnostic hysterolaparoscopy helps in finding the etiology and planning further management.
Aims & objective: To Evaluate the role of simultaneous combined diagnostic hysterolaparoscopy in the evaluation of female infertility.
Materials and methods: This was a descriptive type of interventional study on 80 infertile patients attending outpatient Department of Obstetrics and Gynaecology, SMS Medical college, Jaipur from June 2018 on words excluding male factor infertility with normal hormonal profile.
Results: We studied 80 patients comprising of 56 (70%) cases of Primary Infertility and 24 (30%) cases of secondary infertility. The average age of active married life in 80 patients was between 8 and 9 years. The most common pathologies found on DHL were Tubal factors in 40% cases, PCOD in 11.3% cases, Endometriosis in 8.5% cases, and uterine anomalies in 6.35% cases.
Conclusion: Laparoscopy and hysteroscopy play very important role as diagnostic tools in infertile women. Combined diagnostic laparoscopy and hysteroscopy should be performed in all infertile patients before the treatment.

Keywords: Role of combined hysterolaparoscopy diagnosis of female infertility multifactorial etiology

Introduction
According to WHO Infertility is defined as inability to conceive after 1 year of regular unprotected sexual intercourse. It affects 10-15% of couples in reproductive age group [1]. National survey of Family Growth estimates an increase in the number of infertile women from 5-6.3 million to 6.4-7.7 million by 2025 [2]. Infertility can be divided into primary and secondary infertility. Primary Infertility denotes those patientswho have never conceived. Globally most infertile couple suffers from primary infertility [3]. The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8% [4]. Secondary Infertility indicates the couple has experienced a pregnancy before although not necessarily alive birth has occurred but failure to conceive subsequently. Resolve-national fertility association states that 3 million couples are unable to conceive for the second time [5].
Though Basic laboratory investigations, routine pelvic examinations, sonography and hysterosalpingosonography (HSG) are good enough to exclude gross intrauterine pathology, but subtle changes in the form of small polyp, adhesions and seedling fibroid are better picked up with magnification by hysteroscopy. Laparoscopy is the gold standard for diagnosing tubal and peritoneal disease, endometriosis and adhesions because no other imaging technique provides same degree of sensitivity and specificity. Laparoscopy with direct visual examination of the pelvic reproductive anatomy is the only method available for specific diagnosis of peritoneal factors that may impair fertility. It is also helpful in diagnosing uterine and ovarian factors [6]. The practice committee of American society of Reproductive Medicine suggests that laparoscopy should be seriously considered before applying aggressive empirical treatments involving significant costs and potential risks [7].
In addition, hysterolaparoscopy guided biopsy and therapeutic procedures such as polypectomy, myomectomy, septal resection and adhesiolysis can be done in same sitting. Thus, the entire procedure becomes, “diagnostic and therapeutic oriented rather than only diagnostic.” [6]
Keeping this in view, the present study was designed to assess the utility of combined hysterolaparoscopy in 80 infertile women, as a single step procedure, which would help in

planning appropriate management in an Indian setting.

Aims & objectives: To Evaluate the role of simultaneous combined diagnostic hysterolaparoscopy in the evaluation of female infertility.

Materials and methods: Our study was a descriptive type of interventional study on 80 infertile women attending Gynaecology OPD in the Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur from June 2018 to June 2019.

Inclusion criteria
All infertile women between age 20 to 40 years.

Exclusion criteria
1. Patients having relative contraindications for hysterolaparoscopy eg. Anatomic obstacles (difficult access to the abdomen, intestinal distention etc.), Physiologic obstacles (cardiovascular, respiratory and chronic liver diseases), and contraindications related to hysteroscopy (bowel obstruction, hernia, generalised peritonitis).
2. Male factor infertility
3. Abnormal hormonal profile
4. Active pelvic Inflammatory disease
5. Active tuberculosis
6. Couples who had not lived together for atleast 12 months.

After taking detailed history, baseline investigations and clinical examination, hysterolaparoscopy was performed during the postmenstrual phase on 7th, 8th or 9th day of cycle under general anaesthesia with written and informed consent.
At the end of the study, data was compiled, and categorized as patients with primary and secondary infertility and benefits and drawbacks of combined hysterolaparoscopy for the diagnosis and treatment in infertile patients analysed.

Observation and discussion
In our study, out of the total 80 patients, 56 (70.00%) had primary infertility and 24 (30.00%) had secondary infertility. The mean age was 26.57 ± 3.39 yrs. in women of primary infertility and 27.58 ± 5.31 years in patients of secondary infertility.

Table 1: Distribution of Cases According to Duration of Infertility

Duration of Infertility (in yrs.)	Group-A (PI)		Group-B (SI)		Total	
	No.	%	No.	%	No.	%
1 – 5	39	69.64	9	37.50	48	60.00
6 – 10	14	25.00	11	45.84	25	31.25
11 – 15	3	5.36	2	8.33	5	6.25
>15	0	0.00	2	8.33	2	2.50
Total	56	100.00	24	100.00	80	100.00

$\chi 2 = 10.131$, d.f. = 3 p = 0.022 Sig

In present study, the range was 1 - 15 yrs. in primary infertility patients and 2 - 20 yrs. in secondary infertility group. Majority of patients of primary infertility (69.64%) and that of secondary infertility (37.50%) had duration of infertility of 1-5 years. Mean duration of infertility in Group-A was 4.71 ± 3 and in Group-B was 7.8 ± 4.8 yrs. The difference in the mean duration of infertility between the 2 groups was statistically significant (p= 0.002). It may be due to the following reasons: -
Women who have children when young may be less inclined to conceive again in later life,
Coital frequency often declines as age increases,
The incidence of subclinical abortion is unknown [8].

Table 2: Distribution of Cases According to the Findings on Diagnostic Hysterolaparoscopy

Procedures	Group-A (PI)		Group-B (SI)		Total abnormal findings	
	Normal (%)	Abnormal (%)	Normal (%)	Abnormal (%)	No.	%
Laparoscopy	13 (23.21)	43 (76.78)	5 (20.82)	19 (33.93)	62	77.50
Hysteroscopy	26 (46.43)	30 (53.57)	12 (50.00)	12 (50.00)	42	52.50
Total	39	73	17	31	104	

Group Aχ^2 =5.665 d. f.=1 P = 0.017(S)
Group B χ^2= 3.279 1 d. f.=1P = 0.07(NS)
total -χ^2 =9.918 d. f.=1; P = 0.002(S)

According to table- 2, In present study, laparoscopic abnormalities were more common than hysteroscopic (77.50% Vs 52.50%) in both primary as well as secondary infertility which is statistically significant (P < 0.002). Pelvic inflammatory disease is the most common abnormality in primary infertility while in secondary infertility incidence of endometriosis and adnexal adhesions are equivocal. Thus gold standard technique for diagnosing these disorders is laparoscopy, which is a better predictor of future spontaneous pregnancy in infertile couples with unexplained infertility.

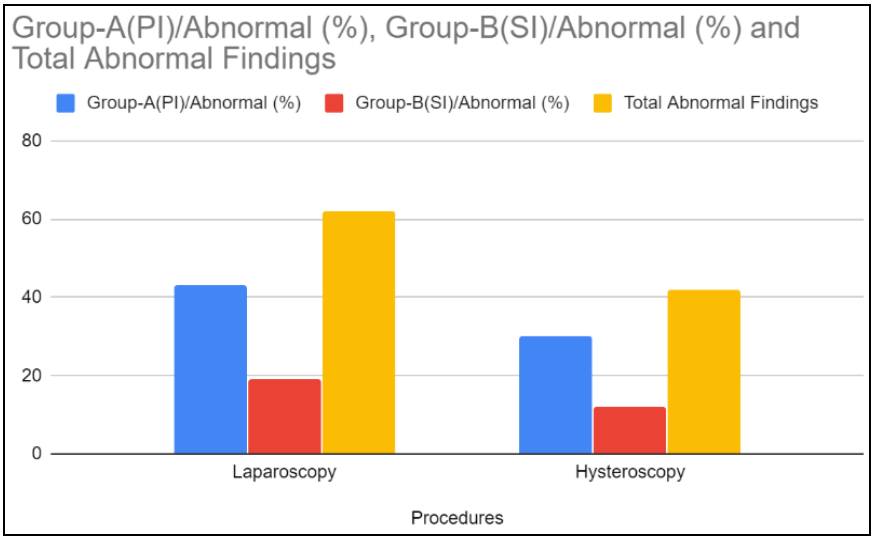

Fig 1: Distribution of cases according to diagnostic hysterolaparoscopy

Mehta AV *et al.* (2016) [9] found similar results, incidence of laparoscopy abnormalities were higher than hysteroscopy (33.67 Vs 18.66).

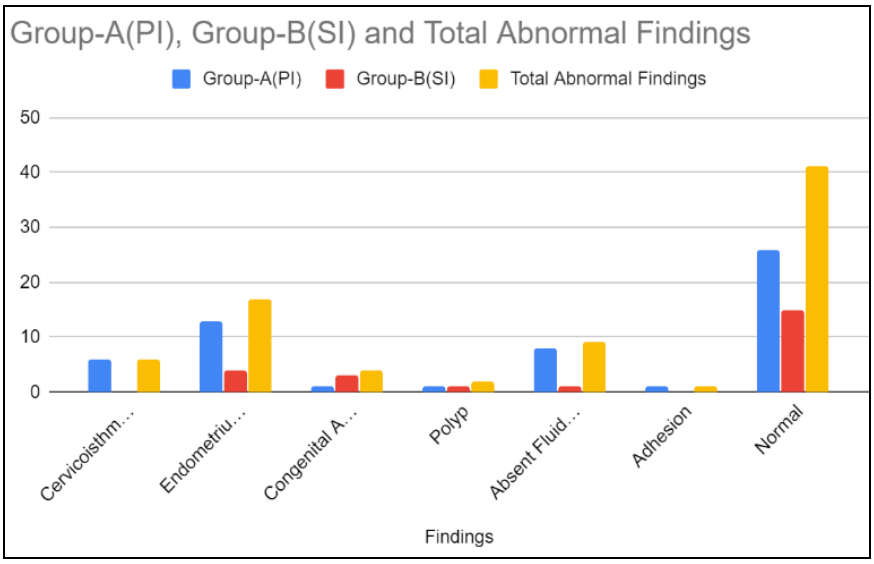

Fig 2: Distribution of Cases According to Abnormalities Detected on Hysteroscopy

In present study, 92.50% of patients had no abnormality in cervix. Pin point cervix, fibrosed cervix and a small polyp of 2 x 1 cm size at the level of internal os was present in 3.57%, 5.36% and 1.79% of patients in primary infertility group respectively.

In the study of Koskas M *et al.* (2010) [10], cervicoisthmic abnormalities were present in 4.3% of patients with 13 cases of polyps (2.3%), 9 cases of stenosis (18%) and 2 cases of adhesions (0.4%).

In present study, 41 (73.21%) patients in Group-A (PI) and 16 (66.66%) patients in Group-B had normal findings during diagnostic hysteroscopy. 2 (3.57%) patients in Group-A and 4 (16.67%) patients in Group-B had atrophic endometrium. And 5 (8.93%) patients in Group-A had polypoidal endometrium. These changes are due to hypoestrogenic and hyperestogenic state respectively associated with irregular periods due to ovarian dysfunction. while 2 (3.57%) patients in the same group had calcified endometrium. 4 (7.14%) patients of Group-A had hyperaemic endometrium. These interfere with implantation, preventing an embryo from attaching to the uterine wall.

Uterine cavity was tubular & narrow in 1 (4.17%) patients of Group-B. Partial septum was present in 1 (1.79%) patient of Group-A and 2 (8.33%) patients of Group-B and one patient (1.79%) of each group had polyp. Similar findings were reported by Puri S *et al.* (2015) [6], Mehta AV *et al.* (2016) [9], Nanaware SS *et al.* (2016) [11]

In present study, 71.25% of total patients had B/L patent ostia (75.00% of patients in Group-A v/s 62.50% of patients in Group-B). 7 (8.75%) patients had periosteal fibrosis in which 4 (7.14%) patients belonged to Group-A and 3 (12.50%) patients belonged to Group-B. 1 (1.78%) patient of primary infertility (Group-A) had flimsy adhesion around B/L ostia.

On diagnostic hysteroscopy in 4 (7.14%) patients of primary and 2 (8.33%) patients of secondary infertility had absent fluid current through B/L ostia. 7.14% patients of primary infertility and 4.16% patients of secondary infertility had absent fluid current through U/L ostia.

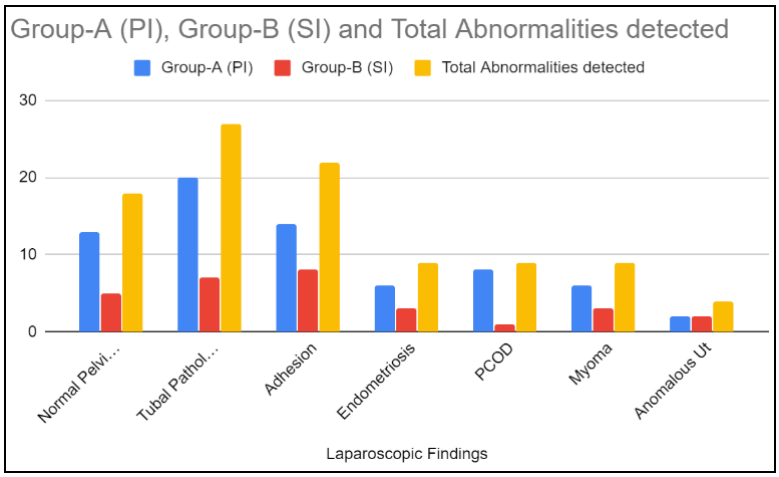

Fig 3: Distribution of Cases According to Abnormalities on Diagnostic laproscopy

In present study, most common laparoscopic uterine abnormality in primary infertility was congestion over the uterine surface in 7 (12.50%) patients, second was fibroid in 6(10.71%) patients, and third was endometriosis and periuterine adhesions in 5(8.93%) cases. One (1.79%) patient had small hypoplastic uterus and another one (1.79%) had tubercles all over the peritoneal cavity involving uterus and bilateral adnexa, peritoneum known as Koch abdomen.

In secondary infertility on laparoscopy, prevalence of periuterine adhesions, fibroid and endometriosis were equivocal. 2 (8.33%) patients in Group-B had chronic inflammation, one (4.17%) had unicornuate uterus and one had rudimentary horn (4.17%). The difference between the 2 groups regarding uterine factors in infertility is not significant (p=0.642).

In present study, maximum number of patients, 10 (17.86%) patients in primary and 2 (8.33%) patients in secondary infertility had dilated and tortuous tubes. It may be due to subclinical PID because of lack of sexual education, unawareness about the advantages of contraceptives and poor perineal hygiene, particularly during menstrual periods. Thus, proper education and counselling of girls are an important preventive measure for infertility.

Tuboovarian mass was found in 5 (8.93%) patients of Group-A and 1 (4.17%) patient of Group-B. 2 (3.57%) patients of Group-A and 1 (4.17%) patient of Group-B had hydrosalpinx.

Peritubal adhesion was found in 2 (3.57%) patients of Group-A and 3 (12.50%) patients of Group-B and 1 (1.79%) patient of Group-A had B/L fibrosed tube. Lead pipe appearance was found in 1.79% patients of Group-A and 12.50% patients of Group-B. Only unilateral tube was found in 3 (12.50%) patients of Group-B due to h/o salpingectomy for ectopic pregnancy.

In present study, 58.92% patients of Group-A had normal ovarian morphology compared to 66.66% from Group-B. Ovary was enlarged and pearly white in 5 (8.93%) patients of Group-A and 1 (4.17%) patient of Group-B. In 5 (8.93%) patients of Group-A and 3 (12.50%) patients of Group-B ovary not visualized due to adhesions. Endometrioma was detected in ovary in 3 (5.36%) patients of Group-A and 2 (8.33%) patients of Group-B.

Ovary was cystic and enlarge in 7.10% patients of Group-A and 4.17% patients of Group-B. 5.36% patients of Group-A and 4.17% patients of Group-B had tubo-ovarian mass in ovary.

In present study, POD was involved in 23 (41.07%) patients in Group-A and 7 (29.16%) patients in Group-B. Hyperaemia was the most common finding, 21.42% cases in Group-A and 12.50% cases in Group-B.

Adhesion was present in 8.93% of Group-A and 8.33% of Group-B. Gunshot lesions of endometriosis was present in 5 (8.93%) patients in Group-A and 2 (8.33%) patients in Group-B. One patient in Group-A had fibrous band obliterating the POD.

21.42% patients in Group-A and 17.50% patients in Group-B had flimsy adhesions which was most common type of adhesions in present study. 3.57% patients in Group-A and 25.00% patients in Group-B had dense adhesion. The difference between the two groups is statistically significant i.e. adhesions were more common in primary infertility in present study. Similar results were found in study of Kabadi YM *et al.* (2016) [12], Rizvi SM *et al.* (2018) [13], Nisar S *et al.* (2019) [14]

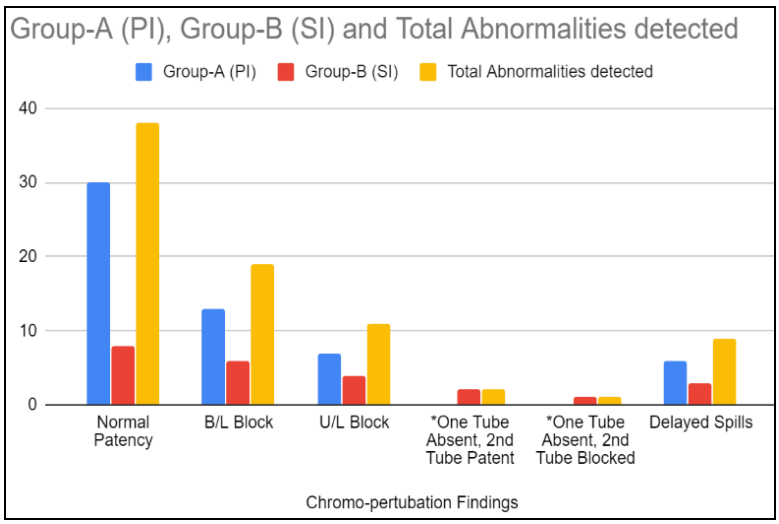

Fig 4: Distribution of Cases According to Tubal Patency on Diagnostic Laparoscopy

On chromopertubation normal patency of the tubes were found in 64.29% patients in Group-A and 45.83% patients in Group-B. B/L tubal block was found in 23.21% in Group-A and 25.00% in Group-B. Unilateral tubal block was found in 12.50% in Group-A and 16.67% in Group-B.

Among three patients of secondary infertility with history of salpingectomy for ectopic pregnancy, two had normal patency and one had agglutinated fimbrial end.

Table 3: Distribution of Cases According to Operative Procedure

Procedure	Group-A (PI)		Group-B (SI)		Total	
	No.	%	No.	%	No.	%
Cystectomy	4	7.14	0	0.00	4	5.00
Adhesiolysis	2	3.57	2	8.33	4	5.00
Laparoscopic Ovarian Drilling	3	5.35	0	0.00	3	3.75
Septal Resection	1	1.78	1	4.17	2	2.50
Laparoscopic Myomectomy	0	0	1	4.17	1	1.25
Hysteroscopic Polypectomy	1	1.78	1	4.17	2	2.50
Cyst Punctured and Suctioned Out	1	1.78	2	8.33	3	3.75
Cervical Cautery	0	0	1	4.17	1	1.25

In 4 (7.14%) patients of Group-A cystectomy was performed for endometrioma. Laparoscopic ovarian drilling was done in 3 (5.35%) patients in Group-A. In 3.57% cases of PI and 8.33% cases of SI adhesiolysis was performed. Septal resection was performed in 1.78% patients of Group-A (PI) and 4.17% patients of Group-B.

In 4.17% cases of Group-B laparoscopic myomectomy was done. Hysteroscopic polypectomy was done in 1.78% patients of Group-A and in 4.17% patients of Group-B.

In 1.78% cases of Group-A (PI) and 4.17% cases of Group-B (SI) ovarian cyst was punctured and suctioned out. Cervical cautery was done in 1 patient of secondary infertility having cervical erosion.

Summary

In our study most common abnormalities on diagnostic hysterolaproscopy was tubal pathology and adhesions in both primary as well as secondary infertility. By using hysterolaproscopy tubal morphology, tubal patency, ovarian morphology, unsuspected pelvic pathology and uterine cavity abnormalities can all be resolved with accuracy at one session.

Conclusion

Diagnostic hysterolaparoscopy plays a valuable role in the comprehensive evaluation of infertility. It helps to find out those causes which are unrevealed by other investigations and thus helps to guide appropriate therapy. Many diagnostic tests for female infertility only have screening value but in view of low complications rate, minimal time requirement and negligible effect on the post-operative course, combined simultaneous diagnostic hysterolaparoscopyis now gold standard test in all infertile patients before treatment.

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