



DIAGNOSTIC HYSTERO-LAPAROSCOPY A ONE-STEP APPROACH IN EVALUATION OF FEMALE INFERTILITY – A RETROSPECTIVE STUDY

Dr Karishma Nimje*

Senior Resident, OBGY department, Datta Meghe Medical College, Nagpur. *Corresponding Author

Dr Amruta Choudhary

Assistant professor, OBGY department, Datta Meghe Medical College, Nagpur.

Dr Anup Gundecha

Assistant professor, OBGY department, GMCH, Nagpur.

ABSTRACT

Infertility affects around 12-16% of couples in reproductive age group. As per WHO the estimated incidence of primary infertility in India is 3.9 – 16.8 %. Almost one-third infertility cases affecting couples are attributed to women, another one-third to men, another third due to interaction between two and 10% are unexplained causes. Diagnostic hystero-laparoscopy has come to light as a vital tool for evaluating infertile females. It provides outstanding means of direct view to explicate concealed pathology. The aim of the study is to highlight the importance of laparoscopy in the evaluation of infertility and objective of the study is to identify the various etiological factors. **Material And Methods:** This was a cross-sectional study conducted in a Tertiary Care Hospital, in Central India, over a period of 8 months. Total 60 cases of infertility both primary and secondary were included in the study, as per inclusion and exclusion criteria and undergone hystero-laparoscopic procedure. **Results:** Amongst the 60 women, primary infertility cases were 34 and secondary infertility cases were 26. On hysteroscopy findings were normal in 35(59%) cases, tubal ostia was not visualized in 3(5%) cases, Septate uterus in 2(3%) cases, submucosal fibroids in 5(8%) cases, flimsy adhesions in 7(12%) cases, endometrial polyps in 8(13%) cases. Laparoscopic abnormality were bulky ovaries and polycystic ovaries in 14 cases(23.3%), endometriosis 11(18.3%) cases, myomas 4(6.6%) cases, pelvic adhesions 4(6.6%) cases and uterine anomalies in 2(3.3%) cases. Tubal block was found in 11(18.3%)cases of infertility. **Conclusion:** Thus, hystero-laparoscopy is a gold standard, safe and effective tool that detects as well as treats numerous abnormalities in different sites like uterus, pelvis, tubes within the same setting.

KEYWORDS :

INTRODUCTION:

Infertility is "A disease of the reproductive system defined by failure of couple to achieve pregnancy after 12 months or more of regular, unprotected sexual intercourse" ⁽¹⁾. Infertility impacts the state of mind of couple medically and socially. Infertility affects around 12-16% of couples in reproductive age group. ⁽¹⁾ As per WHO the estimated incidence of primary infertility in India is 3.9 – 16.8 % ⁽²⁾. Almost one-third infertility cases affecting couples are attributed to women, another one-third to men, another third due to interaction between two and 10% are unexplained causes. ⁽³⁾ Causes of infertility in females – Ovulatory dysfunction (20-40%), tubo- peritoneal pathologies (30-40%), uterocervical pathologies being relatively uncommon and remainder are unexplained.

Infertility is farther classified as primary infertility, where patient has never conceived in her lifetime and secondary infertility, where prior pregnancy, although not necessarily a live birth, has occurred. Most causes observed by WHO are Sexually Transmitted Diseases(STD's), malnourishment, genital tuberculosis, puerperal infections which ultimately lead to tubal block.

Evaluation is recommended to all such couples who failed to achieve live pregnancy after a year or more of regular unprotected intercourse and an earlier evaluation is validated for females with irregular or infrequent menses, with history of pelvic infection or endometriosis, or a male partner with known or suspicious poor quality semen analysis, evaluation is also highly recommended after 6 months of futile effort for women over the age of 35 years. An optimal infertility investigation should follow a logical order at correct time. Hysteroscopy or/and laparoscopy are used if no abnormality is found on initial screening.

Diagnostic hystero-laparoscopy has come to light as a vital tool for evaluating infertile females and it's also a final test of workup before proceeding for infertility treatment. It a benchmark test for tubal patency. ⁽⁴⁾ It provides outstanding

means of direct view to explicate concealed pathology. It has an edge over ultrasonography as it evaluates pelvic organs and fallopian tubes thoroughly by direct visualization to excavate more information. These pathologies are frequently overlooked in routine checkups and radiological examinations. In adjunct to diagnosing, DHL bestows an outstanding benefit of carrying out therapeutic interventions in same setting.

This study was taken up to highlight position of laparoscopy in infertility evaluation.

AIMS AND OBJECTIVES:

The aim of the study is to highlight the importance of laparoscopy in the evaluation of infertility and objective of the study is to identify the various etiological factors associated infertility.

MATERIALS AND METHODS:

This was a cross-sectional study conducted in a Tertiary Care Hospital, in Central India, over a period of 8 months from March, 2019 to October, 2019. Patients who presented with complaints of primary and secondary infertility at tertiary care center during study period that satisfied the set inclusion and exclusion criteria in the study are included.

Inclusion Criteria:

Women with primary or secondary infertility, also who were willing to provide consent for the study and those with no positive results after ovulation induction for minimum 3 cycles.

Exclusion Criteria:

Patients with contraindications, relative as well as absolute, for laparoscopy i.e. preexisting cardio-respiratory conditions, peritonitis, intestinal ileus, hernia or intestinal obstruction are withdrawn from study. Any psycho sexual dysfunction in couples and couples under any kind of substance abuse, were also withdrawn from study.

Total 60 cases of infertility both primary and secondary were

included in the study. A complete history, general physical examination, routine investigations include- hemoglobin estimation, blood grouping and Rh typing, HIV, HbsAg, VDRL, X-ray chest and ECG was done for pre – anesthetic evaluation. Apart from investigations needed for pre-anesthetic checkup, semen analysis was also done. Patient's information was obtained as per the designed format which included, age, period of infertility, type of infertility and primary Laparoscopic findings.

The laparoscopic examination was done in an operation theater under General Anesthesia in post menstrual phase. Hysteroscopy was performed first- vagina and cervix were examined for abnormalities like (Growth, Polyp, etc.), thereafter uterine cavity was inspected for the existence of septum or congenital malformation, any fibrotic bands and synechia, polyps, fibroid, endometrium, both tubal ostia were examined.

Pneumoperitoneum was created, the distending medium used is carbon di-oxide and laparoscopy was carried out to carefully examine for any pathology in – B/L fallopian tubes, B/L ovaries, peritoneum of pelvic cavity and cavity itself and cul-de-sac. Detailed inspection of each structure was performed. Uterus, externally examined for its shape, size, position, surface and presence of fibroid. The cul-de-sac, inspected for obliteration, any adhesions, endometriotic nodules or fluid. Ovaries observed for shape, size, color, surface and presence of cysts and its relation to tubes. The fallopian tubes observed for surface, shape, size, dilatation, kinking or stricture or hydrosalpinx. At last fallopian tube patency was checked using chromopertubation Test. A dilute solution Methylene blue was infiltrated with a 20cc syringe through Leech Wilkinson cannula inserted in cervix and spill of dye from both fimbrial ends of tube was observed.

Statistical Analysis:

Statistical analysis was done by using SPSS software 23.0

RESULTS:

Amongst the 60 women, who underwent diagnostic hysterolaparoscopy, primary infertility cases were 34 (54.6%) and secondary infertility cases were 26 (43.3%). Amongst primary cases of infertility , majority cases were in the age group of 26 to 30 years – 18 (52.9%), whereas in secondary cases of infertility majority cases were in age group of >30 years – 14 (46%).(Table 1) The period of infertility range was 1.5 to 15 years. Majority of cases had duration of infertility in the range of 2 years to 5 years in both, cases of primary infertility -18 (52.9%) and in cases of secondary infertility-14(53.8%).(Table 2.)

Table 1. Age Distribution

Age in Years	Primary Infertility	Secondary Infertility	Total
21-25	8 (23.5%)	5 (19.2%)	13
26-30	18 (52.9%)	7 (26.9%)	25
31-35	7 (20.5%)	10 (38.4%)	17
36-40	1 (2.9%)	4 (15.3%)	05
Total	34	26	

Table 2. Period Of Infertility:

Period of Infertility	Primary Infertility	Secondary Infertility	Total
1.5-5 Years	18(52.9%)	14(53.8%)	32
6-10 Years	14(41.1%)	12(46.1%)	26
10-15 Years	2(5.8%)	0	2
Total	34	26	

The different causes of infertility in patients undergoing Hysteroscopy shown in pie chart, revealed normal findings in 35(59%) cases, tubal ostia was not visualized in 3(5%) cases, Septate uterus in 2(3%) cases, submucosal fibroids in 5(8%) cases, flimsy adhesions in 7(12%) cases, endometrial polyps

in 8(13%) cases. Figure 1)

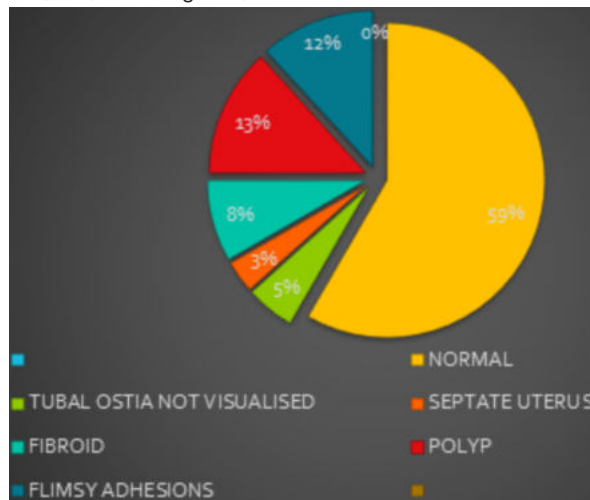


Figure 1. Causes Of Infertility On Hysteroscopy

After hysteroscopy, diagnostic laparoscopy with bilateral chromopertubation test was done. The various causes of infertility observed in diagnostic laparoscopy shown in bar diagram, revealed: Normal laparoscopic findings in 14(23.3%) cases of female infertility. The most common diagnostic laparoscopic abnormality was bulky ovaries and polycystic ovaries in 14 cases(23.3%) ,of which 9(64.2%) cases were of primary infertility and 5(35.7%) cases were of secondary infertility. Other laparoscopic abnormalities seen were, endometriosis 11(18.3%) cases, myomas 4(6.6%) cases, pelvic adhesions 4(6.6%) cases and uterine anomalies in 2(3.3%) cases.(Figure 2) Tubal block was found in 11(18.3%)cases of infertility, of which 6(54.5%) cases had unilateral tubal block on chromopertubation test, demonstrating free spill by only one fallopian tube and 5(45.4%) cases with bilateral tubal block, demonstrating no free spill in either of the tubes. Other tubal pathology detected was delayed tubal spill seen in 19(31.6%) cases of infertility.(Figure 3)



Figure 2. Causes Of Infertility On Laparoscopy

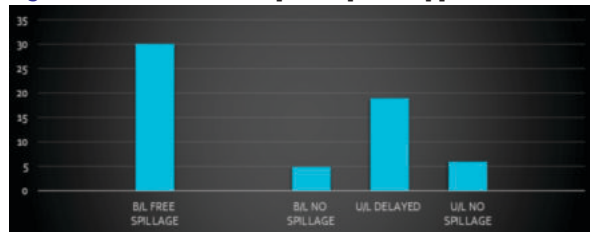


Figure 3. Results of Chromopertubation

DISCUSSION:

Diagnostic hysterolaparoscopy might appear to be invasive, but it's a beneficial tool for diagnosing the etiological factors of female infertility and treating the local causes by carrying out therapeutic interventions in the same setting, making hysterolaparoscopy a one-step approach to infertility. Also, appropriate decisions can be made at right time for artificial

reproductive techniques can be taken after evaluating patients by hysteron-laparoscopy.⁽⁵⁾

There is added advantage of minimal complexity of procedure. According to the study done by Mettler, the study reported the complexity rate of hysteroscopy as 1.65%⁽⁶⁾. But when monitored with laparoscopy, the rate of complexity decreased. Thus hystero-laparoscopy is a secure procedure, with no major surgical or anesthetic complications except for mild abdominal pain in few of our patients.

In our study, out of 60 infertile women, 34(56.6%) women presented with Primary and 26(43.3%) women with secondary infertility. The results were similar to studies conducted by Gondotra *et al*(2018),Shetty KS *et al*(2013)⁽⁷⁾,Nayak KP *et al*(2013)⁽⁸⁾, Vaid K *et al*(2014).⁽⁹⁾

Age of female is one of the important factor for conception by both means – spontaneous and treatment related. The universal accepted definition for advanced reproductive age does not exist, but 35 years is contemplated as maximum in fertility terms (American Society of Reproductive Medicine 2006).⁽¹⁰⁾ As decline in fertility as well as increased time period to achieve conception after the age of 35 years, such women ought to be evaluated following 6 months of failure to achieve conception. In our study 5 patients out of 60, were in the age group of >35 years, of which maximum patients- 4 had secondary infertility and 1 patient had primary infertility.

Our study observed most common hysteroscopic abnormality found was endometrial polyps-8 cases(13%), flimsy intrauterine adhesions-7 cases(12%) and fibroids-4cases(6.6%).The mechanisms that reduces the fertility outcome in cases of uterine myomas and endometrial polyps are: cornual myomas which compress the interstitial part of tube, interference with sperm or ovum transport, implantation of embryo, and decreased regional flow of blood causing focal endometrial ulceration or attenuation.⁽¹¹⁾The frequency of endometrial polyps in asymptomatic cases of infertility is observed to be in between 10% to 32%^{(12),(13)}.

In our study, the commonest intrauterine abnormality observed is septate uterus, that went undetected by ultrasonography. Amongst the congenital uterine abnormalities, septate uterus has worst reproductive outcome.^{(14),(15)}Diagnosis of uterine septum is not an indication of septal resection, but an uncorrected uterine septum has a poor reproductive outcome in the form of recurrent pregnancy loss. Reproductive outcome is dramatically increased after septal resection (80% term delivery, 5%preterm delivery, 15% pregnancy loss)⁽¹⁴⁾. The current hysteroscopic operative techniques made septal resection an easy as well as brief day care procedure with prompt recovery and decreased morbidity. Therefore, resection of septum is liberally recommended nowadays.

Diagnostic laparoscopy is also a standard method of detecting tubal pathology, endometriosis, peritoneal factors and intra-abdominal etiologies of infertility^{(16),(17),(18)}. In our study, most common diagnostic laparoscopic abnormality was bulky ovaries and polycystic ovaries in 14 cases(23.3%) and next in line was, Tubal block found in 11(18.3%)cases.

Thus diagnostic hysteron-laparoscopy is very important one step approach in the workup of primary as well as secondary infertility.^{(19),(20),(21)}

CONCLUSION:

It is evident from our study that, diagnostic methods are a crucial part of assessment of causes of female infertility. Hystero-laparoscopy is a gold standard, safe and effective tool that detects as well as treats numerous abnormalities in different sites like uterus, pelvis, tubes within the same setting.

Hysterolaparoscopy is a suitable and feasible procedure, making it a "One-step approach" in assessing and treating female infertility. Thus we conclude from our study that, combined hysteroscopy and diagnostic laparoscopy should be considered in all infertility cases before treatment, as other diagnostic tests have only screening value.

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Conflict Of Interest:

The authors declare that there is no conflicts of interest.

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Ethical Approval:

This was a cross sectional observational study and it was approved by the ethical committee of the institute and has been performed with the ethical standards described in an appropriate version of the 1975 Declaration of Helsinki, as revised in 2000

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