International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583

Diagnostic Hysterolaparoscopy for Evaluation of Infertility: A Study of 140 Cases at a Tertiary Health-Care Center, Ahmedabad, Western India

Dr. Babulal S. Patel[1], Dr. Adwait B. Patel[2], Dr. Akash J. Patel[3], Dr. Saumya P. Agrawal[4], Dr. Sapna R. Shah[5]

[1]PhD Scholar, Gujarat University, MD (Professor of Obstetrics and Gynecology), Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad – 380006, India (Corresponding Author)

[2]MBBS (Medical Officer), Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad – 380006, India

[3]MBBS (Resident), Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad – 380006, India

[4]MD (Senior Resident), Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad – 380006, India

[5]MD (Professor of Obstetrics and Gynecology), Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellisbridge, Ahmedabad – 380006, India

Abstract: ***Aims and Objectives: According to WHO, the prevalence of infertility is about 10%–15% of reproductive age couples. Our aim of this study is to assess the demographic details of the patients of infertility, the role of hysteroscopy and laparoscopy in the evaluation of female anatomical etiology of infertility and the therapeutic role of these endoscopic modalities to correct anatomical pathology responsible for female infertility. Material and Method: This retrospective computer based data analysis of 140 cases of female infertility was conducted at Sheth V. S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ahmedabad, Gujarat, India from January 2015 to December 2018. Women aged 19-45 years with normal hormone profile without male factor infertility were included. Results: Out of 140 cases, 92 (65.7%) patients had primary infertility. While laparoscopy detected abnormalities in 62.9% of the cases, significant hysteroscopy findings were noted in 18.6% of cases. While the most common laparoscopic abnormality was adnexal adhesion (17.1%), hysteroscopy synechiae as the most common abnormality in both groups. Conclusion: Hysterolaparoscopy is an effective diagnostic tool for evaluation of certain significant and correctable tubo-peritoneal and intrauterine pathologies like peritoneal endometriosis, adnexal adhesions, and subseptate uterus, which are usually missed by other imaging modalities. It has proved to be diagnostic as well as therapeutic procedure for female pelvic pathologies responsible for infertility.***

Keywords: Hysteroscopy, infertility, laparoscopy

1. Introduction

The WHO has defined infertility 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." The prevalence of infertility is about 10%–15% of reproductive age couples.[1] According to the WHO, the overall prevalence of primary infertility in India is between 3.9 and 16.8%.[2] Sexually transmitted infections are among the leading cause of infertility worldwide, especially in developing countries [3] which can lead to pelvic inflammatory disease (PID) and tubal damage. Among the causes of infertility female factor (40%–55%) remains the foremost reason followed by male factor (30%–40%), combined factor (10%), whereas in 10% cases etiology remains unexplained. Diagnostic hysterolaparoscopy (DHL) has emerged as the essential tool for the evaluation of female infertility and is the gold standard investigation for tubal patency. The importance of DHL lies in the fact that it gives a detailed, direct visualization and analysis of the uterine cavity, endometrium, tubal morphology and patency, uterine, ovarian, and adnexal pathology. These pathology findings are often missed in routine clinical examination and ultrasound scan. In addition to diagnosis, DHL also provides the additional benefit of therapeutic interventions in few conditions.

This study was undertaken to evaluate the role of diagnostic hystero-laparoscopy (DHL) in the comprehensive work up of infertility, which would help in planning appropriate management.

2. Materials and Methods

The present study is a retrospective computer based data analysis conducted in a tertiary care center, Sheth V.S. and Sheth C.M. Hospital, N.H.L. Municipal Medical College, Ahmedabad, Gujarat, Western India. Over a period from January 2015 to December 2018. Infertile couple with primary and secondary infertility aged between 19 and 45 years were included in the study. However, only those patients above 40 years of age who had good antimullerian hormone level, and hence, could be potentially benefited from the DHL were included in this study. Primary infertility patients were those who had never conceived

before whereas secondary infertility patients had one prior conception before regardless of the duration, site, and outcome.

In our study for inclusion, as per definition, minimum 1 year of infertility was taken into account. That means, for primary infertility, inability to conceive after minimum of 1 year of unprotected sexual intercourse and for secondary infertility, the same duration and criteria after previous obstetrical event. However, in our study, there was no upper limit of duration of infertility. Patients with abnormal hysterosalpingogram were also included in the study irrespective of the presence or absence of another known etiology of infertility. In our institute, it is a routine protocol to perform DHL and Chromopertubation (CPT) in a diagnosed case of tubal block by HSG. The patients with abnormal HSG findings (unilateral or bilateral tubal block and uterine anomaly) were included and confirmed by DHL. However, we did not compare the finding of HSG with that of DHL in our study.

Exclusion Criteria

1) Endocrine disorder causing chronic anovulation or oligoovulation such hyperprolactinemia, thyroid disorder, etc.
2) Couples with abnormalities in semen analysis were also excluded.
3) Patients having any relative and absolute contraindication to laparoscopy.

DHL with CPT was performed in the preovulatory (day 6–12 of menstrual cycle). Transvaginal sonography before DHL was performed routinely to evaluate the antral follicular count.

3. Results

Table 1: Demographic Data:

Age (Years)	Primary (n-92)	Secondary (n-48)
19-25	42 (30%)	19 (13.6%)
26-30	26 (18.6%)	17 (12.1%)
>30	24 (17.1%)	12 (8.6%)
Duration of infertility (Years)	Cases (n-140)	Nandhini et al (n-50)
1-6	99 (70.7%)	36 (72%)
7-12	31 (22.1%)	11 (22%)
13-18	10 (7.2%)	3 (6%)
Education	Cases (n-140)	Sachdev et al (-50)
Illiterate	17 (12.1%)	19 (38%)
Primary (Class 1-8)	54 (38.5%)	22 (44%)
Secondary (Class 9-10)	24 (17.1%)	5 (10%)
High (Class 11-12)	32(22.9%)	3 (6%)
Graduate	13 (9.4%)	1 (2%)

A total number of 140 patients underwent DHL out of which 92 (65.7%) suffered from primary infertility and 48 (34.3%) suffered from secondary infertility. Majority of patient of primary as well as secondary infertility were from age group of 19-25 years, and most of the cases of infertility were having the condition for around 1-6 years (70.7%), while 72% women had infertility of the same duration in a study by Nandhini et al.

Most of the cases (38.5%)had primary education. In PK Sachdev et al study 44% women had primary level education.[Table 1].

Table 2: Hysteroscopic Findings

Finding	Cases (n-140)	Prasanta K N et al (n-300)
Normal	114 (81.4%)	244 (81.3%)
Myoma	2 (1.4%)	8 (2.6%)
Polyp	5 (3.6%)	16 (5.3%)
Septum	10 (7.1%)	29 (9.6%)
Synechiae	5 (3.6%)	1 (0.3%)
Cervical Stenosis	4 (2.9%)	0

Table 3: Laparoscopic Findings

Finding	Cases (n-140)	Ramalingappa c et al (n-668)	Prasanta K N et al (n-300)
Normal	52 (37.1%)	270 (40.4%)	199 (66.3%)
Unilateral Tubal Block	21 (15%)	30 (4.5%)	30 (10%)
Bilateral Tubal Block	8 (5.7%)	25 (3.7%)	31 (10.3%)
Ovarian Cyst	14 (10%)	184 (27.5%)	22 (7.3%)
PCOS	16 (11.4%)		
Pelvic Inflammatory Disease	9 (6.4%)	72 (10.8%)	
Adhesions	24 (17.1%)	128 (19.2%)	26 (8.7%)
Fibroid Uterus	21 (15%)	42 (6.3%)	15 (5%)
Endometriosis	15 (10.7%)	59 (8.8%)	37 (12.3%)
Anomaly	3 (2.1%)	12 (1.8%)	3 (1%)

In the present study laparoscopic abnormalities were more common than the hysteroscopic [Table 2] [Table 3]. In both, the groups laparoscopic abnormalities were significant The most common abnormalities found during laparoscopy were features of PID (adnexal adhesion and hydrosalpinx) [Table 4]. 9 patients in primary and three in secondary infertility had findings suggestive of tuberculosis, for example, caseous material in pelvis and visible tubercles on fallopian tubes and pelvic serosa (tuberculosis was confirmed later on by polymerase chain reaction). The most common abnormality in hysteroscopy was uterine synechiae (6.4%) [Table 3]. 2 patients in primary infertility group had cervical stenosis. Bilateral block was more common than the unilateral one.

Patients did not suffer from any major complication during or after the procedure. Mild abdominal pain in the perioperative site was the only complaint.

Table 4: Operative Procedure Performed during Diagnostic Hysterolaparoscopic Evaluation:

Procedure	Cases (n-140)	Keya vaid et al (n-193)
PCO	12 (8.5%)	10 (5.2%)
Ovarian Cystectomy	4 (2.9%)	2 (1%)
Adnexal Adhesiolysis	18 (12.9%)	71 (36.8%)
Fulgration of Endometriotic Spots	5 (3.6%)	29 (15%)
Salpingectomy	11 (7.9%)	2 (1%)
Fimbrioplasty	6 (4.3%)	-
Laparoscopic/ Hyteroscopic Myomectomy	13 (9.3%)	50 (25.9%)
Hysteroscopic Septal Resection	2 (1.4%)	-
Unilateral Tubal cannulation+ Selective chromopertubation	16 (11.4%)	4 (2.1%)
Hysteroscopic Polypectomy	4 (2.8%)	10 (5.2%)

In the present study, apart from diagnostic use, hysteroscopy was used for myomectomy for fibroid cases (9.3%), septal resection (1.4%), and polypectomy (2.8%). Laparoscopy was used for PCO driiling in 8.5% cases, cystectomy in 2.9% cases, adhesiolysis in 12.9% cases, fulguration of endometriotic spots in 3.6%, salpingectomy in 7.9%, unilateral tubal cannulation followed by selective chromopertubation in 11.4% cases, fimbrioplasty in 4.3% cases, and myomectomy in 9.3% cases. The results were comparable to study done by Keya Vaid t al.

4. Discussion

Infertility is a serious problem to the couple and brings about family unhappiness and mental trauma and is a matter of financial burden. Among female factor infertility, the most common cause is tuboperitoneal pathology accounting for 30%–35% cases [4] followed by ovulatory dysfunction (20%–30% cases) and uterine pathology (15% cases).[5] The gold standard for evaluating tuboperitoneal pathology is laparoscopy.[6] In our study, pelvic adhesion and hydrosalpinx were the two most common tubopelvic pathologies as seen in laparoscopy. Adnexal adhesion is an established feature of PID.[7] The important etiologies of hydrosalpinx are PID and pelvic tuberculosis.[8] It is a proven fact that hydrosalpinx is associated with infertility and even poor IVF outcome.[9] Now, the prevalance of PID in India ranges from 1% to 17%.[10] Even subclinical PID is substantially associated with infertility and women with subclinical PID achieved 40% less pregnancies compared to women without the same.[11] Tubal factor infertility is the foremost reason of infertility among female patients, the majority of which is due to PID.[12] In our study, apart from hydrosalpinx, few other features such as caseous material in the pelvis, pouch of douglas, and tubercles on the tubes or pelvic serosa were present. The prevalence of genital tract TB in female ranges from 1% to 19% depending on the region.[13] A study conducted in India found that more than 25% infertile patients (40 out of 150) had genital tuberculosis.[14]

In the present study, overall10.7% patients had findings of endometriosis during laparoscopy in the form of endometrioma, endometriotic nodules, chocolate cyst of ovary and other characteristic endometriotic lesions such as powder burn lesions. Laparoscopy remains the gold standard for diagnosing endometriosis by visual inspection of the lesions.[15] It is estimated that around 30%–50% patients with endometriosis suffer from infertility.[16]

15% patients in present study during laparoscopy and 2.1% patients during hysteroscopy were found to have myoma. Pritts *et al*. concluded that submucosal fibroids (International Federation of Gynecology and Obstetrics [FIGO] L0–L2) which cause distortion of the uterine cavity resulted in the decreased rates of clinical pregnancy, implantation, and ongoing pregnancy/live birth, as well as an increased rate of spontaneous miscarriage.[17] The review by Pritts *et al*. also concluded that women with fibroids with no submucosal involvement, i.e., pure intramural fibroids (FIGO L3–L4), had decreased rates of implantation and ongoing pregnancy/live birth, and an increased rate of spontaneous miscarriage when compared with controls without fibroids.[18] In addition, there was no evidence to suggest that subserosal (FIGO L5– L7) fibroids decreased any measure of fertility.[17]

The prevalence of uterine anomaly in infertility patient is 8%, the foremost reason being septate uterus. Arcuate uterus is most common in the population without any high risk, and its prevalence is not increased in high-risk groups, for example, having infertility.[18] In our study, 2.1% patients in laparoscopy were found to have uterine anomaly.

Intrauterine adhesions (Asherman syndrome) are a rare but significant cause of menstrual disturbance and infertility.[19] It is an established fact that unlike developed countries genital tuberculosis is an important cause of Asherman syndrome in India.[20] In our study, the most common finding in hysteroscopy was intrauterine adhesions.

In this study, 15.0% patients had unilateral tubal block whereas 5.7% patients had bilateral tubal block. Our hospital is a tertiary one and majority of the patients are referred here with already diagnosed tubal block on hysterosalpingogram. That can explain the high prevalence of tubal block on chromopertubation in our study.

Knowledge is a key factor associated with fertility self-care. Educated couples tend to know more about STDs and other genital tract infections. They have knowledge regarding the fertility period and also seek medical hospital faster.[21]

Postoperarative period was uneventful for most of the patients. Mild postoperative pain was the only minor complaint which could be controlled with mild analgesics. No hemorrhagic or infective complications were seen during or after the procedure.

5. Conclusion

Diagnostic hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility, particularly for detecting peritoneal endometriosis, adnexal adhesions, and septum in the uterus. These are correctable abnormalities that are unfortunately missed by routine pelvic examination and usual imaging procedures. Needless to emphasize that, it is a very useful tool that can detect various structural abnormalities in multiple sites like pelvis, tubes, and the uterus in the same sitting in patients with normal ovulation and seminogram. When done by experienced hands and with proper selection of patients, hystero-laparoscopy can be considered as a definitive investigative daycare procedure for evaluation of female infertility. This helps in formulating specific plan of management.

6. Declaration

Source of Support: Nil

Conflict of Interest: None declared

7. Acknowledgments

Authors would like to thank

Mr.Dipesh Manishkumar Patel, Biology major student, Penn state University Park, State College , PA , U.S.A. For study Design.

Nidhi H Desai, School of Visual Arts and Design and Social Innovations, MFA, DSI course, 23rd Street, Manhattan, NY, U.S.A. and

Dr.Vismay B Patel, 330, Angelo Cifelli Dr, Apt.239, Harrison NJ 07029, U.S.A. for their motivation and guidance for data analysis and presentation of this study.

References

[1] Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: Potential need and demand for infertility medical care. Hum Reprod. 2007;22:1506–12. [PubMed] [Google Scholar]
[2] Infecundity, Infertility, and Childlessness in Developing Countries. DHS Comparative Reports No. 9. Calverton, Maryland, USA: ORC Macro and the World Health Organization; 2004. [Google Scholar]
[3] Ombelet W, Cooke I, Dyer S, Serour G, Devroey P. Infertility and the provision of infertility medical services in developing countries. Hum Reprod Update. 2008;14:605–21. [PMC free article] [PubMed] [Google Scholar]
[4] Miller JH, Weinberg RK, Canino NL, Klein NA, Soules MR. The pattern of infertility diagnoses in women of advanced reproductive age. Am J Obstet Gynecol. 1999;181:952–7. [PubMed] [Google Scholar]
[5] Wallach EE. The uterine factor in infertility. FertilSteril. 1972;23:138–58. [PubMed] [Google Scholar]
[6] Mol BW, Collins JA, Burrows EA, van der Veen F, Bossuyt PM. Comparison of hysterosalpingography and laparoscopy in predicting fertility outcome. Hum Reprod. 1999;14:1237–42. [PubMed] [Google Scholar]
[7] Molander P, Finne P, Sjöberg J, Sellors J, Paavonen J. Observer agreement with laparoscopic diagnosis of pelvic inflammatory disease using photographs. Obstet Gynecol. 2003;101:875–80. [PubMed] [Google Scholar]
[8] Boukaidi SA, Delotte J, Steyaert H, Valla JS, Sattonet C, Bouaziz J, et al. Thirteen cases of isolated tubal torsions associated with hydrosalpinx in children and adolescents, proposal for conservative management: Retrospective review and literature survey. J Pediatr Surg. 2011;46:1425–31. [PubMed] [Google Scholar]
[9] Harb H, Al-Rshoud F, Coomarasamy A. The effect of presence and management of hydrosalpinx on miscarriage in IVF. FertilSteril. 2014;1:102–298. [Google Scholar]
[10] Latha K, Kanani SJ, Maitra N. Prevalence of clinically detectable gynaecological morbidity in India: Results of four community based studies. J Fam Welf. 1997;43:8–16. [Google Scholar]
[11] Wiesenfeld HC, Hillier SL, Meyn LA, Amortegui AJ, Sweet RL. Subclinical pelvic inflammatory disease and infertility. Obstet Gynecol. 2012;120:37–43. [PubMed] [Google Scholar]
[12] Centers for Disease Control and Prevention, American Society for Reproductive Medicine, Society for Assisted Reproductive Technology. 2007 Assisted Reproductive Technology Success Rates: National Summary and Fertility Clinic Reports. Atlanta (GA): U. S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2009. [Google Scholar]
[13] Varma TR. Genital tuberculosis and subsequent fertility. Int J Gynaecol Obstet. 1991;35:1–1. [PubMed] [Google Scholar]
[14] Gupta N, Sharma JB, Mittal S, Singh N, Misra R, Kukreja M, et al. Genital tuberculosis in indian infertility patients. Int J Gynaecol Obstet. 2007;97:135–8. [PubMed] [Google Scholar]
[15] Kennedy S, Bergqvist A, Chapron C, D'Hooghe T, Dunselman G, Greb R, et al. ESHRE guideline for the diagnosis and treatment of endometriosis. Hum Reprod. 2005;20:2698–704. [PubMed] [Google Scholar]
[16] Counsellor VS Endometriosis. A clinical and surgical review. Am J Obstet Gynecol. 1938;36:877. [Google Scholar]
[17] Pritts EA, Parker WH, Olive DL. Fibroids and infertility: An updated systematic review of the evidence. FertilSteril. 2009;91:1215–23. [PubMed] [Google Scholar]
[18] Chan YY, Jayaprakasan K, Zamora J, Thornton JG, Raine-Fenning N, Coomarasamy A, et al. The prevalence of congenital uterine anomalies in unselected and high-risk populations: A systematic review. Hum Reprod Update. 2011;17:761–71. [PMC free article] [PubMed] [Google Scholar]
[19] Thomson AJ, Abbott JA, Deans R, Kingston A, Vancaillie TG. The management of intrauterine synechiae. CurrOpinObstet Gynecol. 2009;21:335–41. [PubMed] [Google Scholar]
[20] Sharma JB, Roy KK, Pushparaj M, Gupta N, Jain SK, Malhotra N, et al. Genital tuberculosis: An important cause of Asherman's syndrome in India. Arch Gynecol Obstet. 2008;277:37–41. [PubMed] [Google Scholar]
[21] Bunting L, Boivinm J. Knowledge about infertility risk factors, fertility myths and illusory benefits of healthy habits in yound people. Hum Repord. 2008 Aug:23 (8):1858-64. Doi:10.1993/humrep/den168.