

Role of hysterosalpingoscopy in management of infertility a retrospective clinical analysis

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ABSTRACT

Background: Diagnosis and treatment of infertility is an elaborate process. The goal of treating clinician is to decide upon the plan of management best suited to the couple by selecting relevant investigations and procedures from available options. Objective was to determine the role of hysterosalpingoscopy in the management of infertility.

Methods: This retrospective study was conducted at a tertiary canter (Department of reproductive medicine and surgery) over a period of 12 months-January 2019 to December 2019. Women aged 20-40 years with primary or secondary infertility, except male factor infertility, undergoing hysterosalpingoscopy were included.

Results: Out of 41 cases, 71.84% patients had primary infertility. Common laparoscopic abnormalities were adhesions (36.5%) and endometriosis (17.07%). Hysteroscopy revealed polyps (9.7%) and intrauterine synechia (4.8%) as common pathologies. The diagnosed pathologies were dealt surgically in the same sitting. Plan of infertility treatment could be outlined in all patients based on intraoperative findings.

Conclusion: Hysterosalpingoscopy serves both diagnostic and therapeutic purpose. Various pelvic, peritoneal, tubal, endometrial and uterine factors can be diagnosed and treated at the same time. The clinician has to be well versed and skilled in selecting and performing the appropriate surgery. Clinical information gained from hysterosalpingoscopy helps in decision making and designing individualized, evidence-based treatment plan can for the patients.

Keywords: Diagnosis, Hysteroscopy, Infertility, Laparoscopy, Treatment

INTRODUCTION

Infertility is a disease of reproductive system defined by failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.¹ Female factor, (40-55%), followed by male factor (30-40%) are the major contributors to infertility. Both partners are affected in 10% of cases, and in approximately 10% couples, the cause remains unexplained.

Approximately 13-19 million couples are likely to be infertile in India at any given time.² The spectrum of pathological conditions affecting fertility in females includes not only anatomical, genetic, and immunological factors, but a significant proportion of sexually

transmitted infections, pelvic inflammatory diseases (PID), postpartum infections, post-abortion infection, genital tuberculosis, previous contraceptive complications and PCOS.³⁻⁶

The critical decision that has to be made for the couple is, whether or not they need advanced assisted reproductive techniques like IVF/ICSI. If yes, how early, and which treatment option is likely to give them the best chance of achieving pregnancy.

Evaluation of ovulation, tubal patency and endometrial cavity in the female and semen analysis of male partner remain cornerstones of evaluation of an infertile couple.

In process of evaluation of female partner, clinical examination and radiological investigations do provide information about pelvic pathologies, albeit only indirectly.

Hysterolaparoscopy gives the clinician a singular opportunity and ability to directly visualize and manipulate uterus and its cavity, fallopian tubes, ovaries, pelvic and peritoneal cavity, though it is not without surgical and anaesthesia risks.

This observational study is a retrospective clinical analysis 41 cases of hysterolaparoscopy, aimed at determining its role in the management of infertility.

The objectives of the study were to evaluate the indications of hysterolaparoscopy in patients of infertility, evaluate the intraoperative findings in hysteroscopy and laparoscopy, and the corrective surgeries performed and assess the application of clinical information obtained by performing the procedure.

METHODS

Case records of all the patients with infertility who underwent hysterolaparoscopy between January 2019 to December 2019 at fertility clinic at a tertiary hospital were analysed by using SPSS software 25.0.

Results of quantitative variables shown by descriptive methods, while qualitative variables by frequency and percentages.

Inclusion criteria included patients of age 20-40 years and primary or secondary infertility as per WHO definition. Exclusion criteria excluded male factor infertility.

History, findings of clinical examination, significant past history, relevant preoperative and pre anaesthesia investigations were reviewed in 41 patients fulfilling the inclusion criteria.

Intraoperative findings were noted in all cases. Protocol for the procedure was as follows-

Hysteroscopy: Cervical canal/uterine cavity /bilateral tubal ostia visualized. Endometrial sample collected in all patients and sent for histopathology and any additional testing as deemed necessary.

Laparoscopy: Pelvis visualized systematically noting size, shape, position of uterus and ovaries, presence of

any ovarian cysts. Fallopian tubes evaluated for appearance, mobility, tubo-ovarian relation and any pathology. Bilateral Ovarian fossae, pouch of Douglas, peritoneal cavity, omentum, sub hepatic and perihepatic space inspected. Chromoperturbation performed to note passage of methylene blue dye from fimbrial end of both tubes. Any diagnosed pathology treated in same sitting.

Patients managed postoperatively as per hospital protocol and discharged next day. They were called for follow up after one week for suture removal. Any histopathology or culture reports were reviewed. A detailed counselling session was conducted to discuss further plan of treatment. It was documented on case record sheet.

RESULTS

Sociodemographic and clinical parameters of patients are summarized in table 1-4.

Table 1: Type of infertility.

Types	No. of patients	Percentage (%)
Primary	32	78.84
Secondary	9	21.95

78.84% patients had primary infertility while 21.95% had secondary infertility, similar to Nayak et al.⁷

Table 2: Age distribution.

Age (Year)	Primary infertility (n=32)	Secondary infertility (n=9)	Total	Percentage (%)
18-25	9	0	9	21.95
25-30	17	6	21	51.21
30-35	6	3	9	21.95
35-40	1	0	1	2.43

Mean age of patients with primary infertility was 28.39 ± 3.88 years while 29.6 ± 3.21 years of those with secondary infertility.

Mean duration of infertility was 5.31 ± 3.44 years in cases of primary infertility, as compared to 3.66 ± 2.95 years in those with secondary infertility (Table 3).

Tubal pathology contributed to 46.87% cases of primary infertility. Tubal pathology and uterine/endometrial factor taken together contributed majority (77.7%) of cases of secondary infertility (Table 4).

Table 3: Duration of infertility.

Duration (years)	Primary infertility (n=32)	Secondary infertility (n=9)	Total	Percentage (%)
<5	14	7	21	51.21
5-10	15	2	17	41.46
>10	3	0	3	7.31

Table 4: Clinical diagnosis (Indication of hysterolaparoscopy).

Diagnosis	Primary infertility (n=32)	Percentage (%)	Secondary infertility (n=9)	Percentage (%)	Total (n=41)	Percentage (%)
Tubal factor	15	46.87	4	44.44	19	46.34
Unexplained	10	31.25	1	11.11	11	26.8
Endometriosis	3	9.37	1	11.11	4	9.75
PCOD	2	6.25	0	-	2	4.78
Cervical stenosis	1	3.12	0	-	1	2.43
Ovarian dermoid	1	3.12	0	-	1	2.43
Endometrial /uterine	0	-	3	33.3	3	7.31

Table 5: Laparoscopy findings.

Findings	Primary infertility (n=32)	Percentage (%)	Secondary infertility (n=9)	Percentage (%)	Total	Percentage (%)
Normal	9	28.12	4	44.4	13	31.7
Ovarian Endometrioma	3	9.37	1	11.1	4	9.75
Endometriosis Spots/ patches	3	9.37	0	-	3	7.31
Adhesions	12	37.5	3	33.3	15	36.58
Tubal pathology	13	40.62	5	55.5	18	43.90
PCOS	2	6.25	0	-	2	4.87
Uterine anomaly	1	3.12	0	-	2	2.43

Table 6: Hysteroscopy findings.

Findings	Primary infertility (n=32)	Percentage (%)	Secondary infertility (n=9)	Percentage (%)	Total (n=41)	Percentage (%)
Normal	25	78.12	6	66.6	32	78.04
Endometrial polyps	3	9.37	1	11.1	4	9.75
Intrauterine adhesions	1	3.12	1	11.1	2	4.87
Fibroid polyp	1	3.12	0	-	1	2.43
Septate	0	-	1	11.1	1	2.43
Unicornuate	1	3.12	0	-	1	2.43

Table 7: Surgical procedures performed.

Surgical procedure	Performed
Laparoscopic adhesiolysis	11
PCO drilling	2
Endometriosis coagulation	3
Ovarian cystectomy(endometrioma)	4
Ovarian cystectomy(dermoid)	1
Para ovarian / fimbrial cystectomy	2
Fimbrioplasty	1
Hydrosalpinx clipping	5
Hysteroscopic cannulation	8
Hysteroscopic Adhesiolysis	2
Septum resection	1
Hysteroscopic polypectomy	4
Hysteroscopic myomectomy	1

Table 8: Results of chromoperturbation.

Result of chromoperturbation	Primary Infertility	Secondary infertility	Total cases	Percentage (%)
Bilateral free spill of dye+	18	5	23	56.09
Bilateral block, No spill from either tube even after hysteroscopic cannulation	1	1	2	4.87
Bilateral block, Bilateral free spill with slight use of force	2	0	2	4.87
Bilateral block, Hysteroscopic cannulation not done because of obvious tubal pathology	3	0	3	7.31
Bilateral block, both tubes opened after hysteroscopic cannulation	1	0	1	2.43
Bilateral block, one tube opened after hysteroscopic cannulation	3	0	3	7.31
Unilateral/bilateral delayed spill	3	1	4	9.75
Unilateral free spill+, other tube diseased, hence hysteroscopic cannulation not done	0	1	1	2.43
Unilateral block, Hysteroscopic cannulation done, spill+ after cannulation	1	1	2	4.87

Table 9: Formulating the treatment plan in cases of tubal factor infertility: correlation between findings of HSG and CPT.

HSG finding	Laparoscopy finding	CPT	Intervention done	T/t plan
B/l proximal tubal block	No abnormality	No spill	Hysteroscopic cannulation -failed	IVF
B/l localized spill	Lt fimbrial end fused with ovary Rt fimbrial end free	Bilateral delayed spill	Adhesiolysis	IUI
Lt distal, Rt proximal block	Lt hydrosalpinx Rt tube small fibrotic	No Spill from either side	Lt Salpingectomy	IVF
B/l mid tubal block	Pelvic adhesions in Lt ovarian fossa Lt hydrosalpinx Rt tubal block	No spill from either side	Adhesiolysis Lt Salpingectomy, Rt tubal clipping	IVF
B/l tubal block	Rt tubal puckering and Lt tube, ovary buried in dense adhesions with bowel in left ovarian fossa	Rt spill and after cannulation	Rt tubal cannulation	IUI
B/l cornual tubal block	Lt unicornuate uterus with Rt rudimentary non communicating horn Bl ovaries normal	Lt spill and after cannulation	Lt tubal cannulation	IUI
B/l tubal block	Peritubal adhesions	Rt spill and after cannulation Lt spill absent	Rt tubal cannulation	IUI
Bl tubal block cornual	No abnormality	Bl spill	-	IUI
Left loculated spill.	Lt fimbrial end everted Rt tube healthy	Left delayed spill Rt spill	Left fimbrioplasty	IUI
B/l tubal block mid segment Cavity defects	Dense adhesions between B/l fimbrial ends with ovaries. Adhesions and in POD	No spill	Intrauterine Adhesiolysis	IVF
Lt cornual tubal block	Submucous fibroid polyp 1.5cm at fundus on hysteroscopy	Lt spill and after cannulation Rt spill	Hysteroscopic myomectomy and Lt tubal cannulation	IUI
Rt spill and Cavity-polyp	Rt tubo omental adhesions	Bl spill	Adhesiolysis	IUI

Continued.

HSG finding	Laparoscopy finding	CPT	Intervention done	T/t plan
Rt mid tubal block				
Rt spill and Lt hydrosalpinx	Lt terminal hydrosalpinx Adhesions and Lt tube and ovarian fossa	Rt spill and Left no spill	Lt salpingectomy and Adhesiolysis	IUI
B/l Cornual Block	B/l ovaries adherent to POD Rt endometrioma 3×3 cm POD adhesions +	B/l spill and after cannulation	Cystectomy B/l tubal cannulation	IUI
Rt Tube Spill and Lt Terminal Hydrosalpinx	Adhesions and Rt tube Ovarian fossa, POD Lt hydrosalpinx+	Rt tube delayed spill and Lt no spill	Rt tubal clipping Lt salpingectomy Adhesiolysis	IVF
B/l Tubal Block	Peritubal adhesions	No Spill Even After cannulation	Adhesiolysis	IVF
Rt Spill and Lt Distal Block	Adhesions and Lt Fimbrial End with Ovary	Rt Spill Lt tube delayed spill	Adhesiolysis	IUI
Left Distal Tubal Block	Left fimbrial cysts flimsy adhesions at distal end of tube	B/l Spill	Left Fimbriolysis	IUI
Left cornual block	No abnormality	Rt spill Left spill and after cannulation	Hysteroscopic cannulation	IUI
Rt localized spill				

B/l-Bilateral, Lt-Left, Rt-Right, HSG-Hysterosalpingography, CPT-Chromoperturbation, POD-pouch of Douglas, IUI-Intrauterine Insemination, IVF-In Vitro Fertilization.

On chromoperturbation, bilateral tubes were found to be patent in 56.09% cases. Tubal patency couldn't be restored at all in either tube in 4.87% cases of tubal block. In 21.91% cases, at least one tube was patent, with or without surgical intervention.

DISCUSSION

Commonest indication for hysterolaparoscopy in patients with infertility was tubal block diagnosed on screening test HSG. (46.34%).⁸

In 13 (31.70%) patients, no abnormality was detected on laparoscopy, 8 (19.5% of total cases) of which had unexplained infertility.

The commonest finding on laparoscopy was adhesions, seen in (36.5%) cases. Majority involved tubes and ovaries, followed by pouch of Douglas, omentum and sub diaphragmatic space. Similar observation was made by Ahmed MS, Bhalerao AN⁹ in their study.

This may be attributed to history of pelvic inflammatory disease, previous surgeries or tuberculosis.¹⁰

Adhesiolysis could be performed in 11 patients, and tubo ovarian relationship restored in 8 patients. Rest were left untouched as either these were dense fibrotic adhesions or because of their involvement/proximity to bowels or sigmoid colon.

Endometriosis was the second common pathological finding (17.5%), similar to study by Puri et al.¹¹ It was staged and treated in the same sitting. Ovarian

cystectomy was performed in all cases of ovarian endometrioma with targeted haemostasis.

Superficial endometriotic spots and patches were noted in 3 cases of unexplained infertility, which were located in the POD, uterosacral ligaments and ovarian fossa. They were coagulated with bipolar cautery.

Majority (75.6%) of patients had a normal uterine cavity and cervical canal on hysteroscopy. Abnormalities were detected in 18.73% cases of primary infertility and 33.3% cases of secondary infertility.

Endometrial polyps were removed with scissors. Submucous fibroid polyp and intrauterine adhesions were dealt with monopolar cautery with glycine as the distension medium. The partial uterine septum was resected with scissors under laparoscopic guidance.

Tubal cannulation was the commonest hysteroscopic procedure performed. Tubal patency of at least one tube could be successfully restored in 75% of attempted cases.

Endometrial sample could be sent for histopathology in all cases except those with intrauterine adhesions. Histopathology showed proliferative endometrium in 31 patients, granulomatous endometritis in 3 patients, fibroid in 1 patient and endometrial polyp in 4 patients. There were no intraoperative or postoperative complications.

Following factors were considered while planning treatment: Age of the female, ovarian reserve, duration of infertility, the underlying pathology, its nature and the corrective actions taken during hysterolaparoscopy, past

treatment history. Current available body of evidence about the medical condition was taken into account.

When bilateral tubal block was confirmed on chromoperturbation, and tubal patency could not be restored by hysteroscopic cannulation, IVF was the treatment of choice.

Patients, who had a distal tubal pathology or hydrosalpinx, underwent salpingectomy or clipping of the hydrosalpinx before proceeding to IVF.¹²

When at least one tube was patent, patients were offered treatment option of IUI. Associated risk of ectopic pregnancy was explained to the couple.

Patients with moderate to severe endometriosis, who had chocolate cysts hindering oocyte retrieval for IVF, were planned to undergo IVF post cystectomy (3 cases).

One patient had a unilateral chocolate cyst (size 3 cm), which was surgically removed, bilateral tubes were found to be patent after hysteroscopic cannulation. After counselling, the patient opted to undergo IUI.

Patients diagnosed with minimal or mild endometriosis were planned to undergo ovulation induction with IUI.¹³

3 patients were put on anti-tubercular medication as their endometrial sampling revealed granulomatous endometritis. Patients with PCOS were advised to try naturally for a period of 6 months after undergoing ovarian drilling.¹⁴

After resection of intrauterine adhesions, patients were put on oral or topical oestrogen preparations to build up the endometrium.^{15,16}

Out of the 41 patients who underwent hysterolaparoscopy, 3 didn't continue the treatment .11 patients were advised to undergo IVF, 20 patients were planned for IUI. 2 patients were advised to try naturally, 3 were put on AKT. 2 patients required treatment to build up the endometrium.

CONCLUSION

Hysterolaparoscopy serves an excellent diagnostic purpose by direct visualization. It gives a unique opportunity to treat the pathology, restore anatomy, and obtain samples for histopathology and/or culture as deemed necessary, all in the same sitting.

In judiciously selected cases, it provides critical information to the clinician, guiding him to design an individualized and evidence-based treatment plan for the couple.

Its role in unexplained infertility needs further exploration to avoid unnecessary surgeries and to ensure rational use of resources.

Till the submission of this publication, 8 (21.05%) patients have conceived. One patient conceived spontaneously, 4 patients with IUI and 3 with IVF.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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