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Original Research Article

Diagnostic laparoscopy in the evaluation of tubal factor in cases of infertility

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ABSTRACT

Background: Tubal factor infertility accounts for a large portion of female factor infertility. The most prevalent cause of tubal factor infertility is pelvic inflammatory disease and acute salpingitis. Tubal patency can be diagnosed by hysterosalpingography (HSG) or laparoscopy with chromopertubation. The aim of this study was to determine the role of laparoscopy in the evaluation of tubal factor in infertile women.

Methods: Sixty women presenting with complaints of primary and secondary infertility were investigated for tubal disease by laparoscopy at Smt. NHL Municipal Medical College, Ahmedabad during July 2011 to September 2013. Tubal patency was tested by chromopertubation using Methylene blue dye.

Results: Thirty-five (58.3%) patients were in primary infertility group while 25 (41.7%) patients were in secondary infertility group. 80% women were in the age group of 21 to 30 years. In 49% of women, the duration of infertility was between 2 to 4 years whereas 17% cases had been infertile for 6 to 10 years. Diagnostic laparoscopy and findings of chromopertubation revealed unilateral blockage in 37% of cases, bilateral blockage had seen in 23% of cases, endometriosis was seen in 9% of cases and adhesion in 7% of cases.

Conclusions: Unilateral and bilateral tubal blockade was detected in 60% of cases of infertile women.

Keywords: Chromopertubation, Infertility, Laparoscopy, Tubal factors, Tubal blockage

INTRODUCTION

The desire to reproduce is an intensely motivating human force. Couples may also experience strong religious, cultural and social pressure to conceive. Infertility is a life crisis for them. The number of couples seeking medical help for infertility is increasing dramatically (from 8% to 10-15%).^{1,2}

Tubal disease is among the most common causes of infertility and is the primary diagnosis in approximately

30% of female infertility cases. The fallopian tubes are very delicate structures that are responsible for picking up the egg and providing the site for fertilization of the egg as well as early embryo development and transport to the uterine cavity. The tubes may be damaged by infections or other pelvic conditions. A previous history of pelvic inflammatory disease, tubal surgery, ectopic pregnancy, ruptured appendix, ovarian surgery or septic abortion strongly suggests the possibility of tubal disease. The most prevalent cause of tubal factor infertility is pelvic inflammatory disease and acute salpingitis. The incidence of tubal damage after one episode of pelvic infection is

approximately 12%, 23% after two episodes and 54% after three episodes.^{3,4} Proximal, distal, and peritubal damage can be caused by a number of pathologic processes such as inflammation, endometriosis, and surgical trauma.⁵

Today in the era of scientific advancement and technology, newer diagnostic and operative modalities have paved the path for further insight into this problem. Laparoscopy has emerged in recent years as an accurate method of assessing, evaluating and treating infertility.^{6,7,8}

Laparoscopy and chromopertubation is widely considered the gold standard test for investigating tubal patency. Additionally, it allows assessment for peritubal disease, adhesions and endometriosis. This has led to a recommendation by the NICE (UK) that women suspected of having comorbidities (such as endometriosis and pelvic inflammatory disease should undergo laparoscopy so that pelvic and tubal pathology can both be assessed.⁹ The aim of the study was to evaluate the role of laparoscopy in diagnosis of infertile women with tubal factors.

METHODS

Sixty women presenting with complaints of primary and secondary infertility were investigated for tubal disease by laparoscopy at Smt. NHL Municipal Medical College, Ahmedabad during July 2011 to September 2013. Inclusion criteria were no prior pelvic surgery, no history of pelvic infection, normal bimanual pelvic examination, and normal semen parameters of partner. Those patients who had medical disorders and contraindication for laparoscopy were excluded from study. Laparoscopy was scheduled in proliferative phase of menstrual cycle.

Laparoscopy was performed under general anesthesia. A one cm incision was made within or just below the lower edge of the umbilicus. Through this incision the abdominal cavity is inflated with carbon dioxide gas and pneumoperitoneum being obtained. A trocar was inserted in the same region. The cannula of the trocar was left, and the trocar was pulled out. Then a laparoscope was introduced through the cannula. During the procedure, the pelvis was inspected, including uterus, fallopian tubes, uterosacral ligaments, and Pouch of Douglas. The tubes were inspected for any abnormality in their length and shape. Both ovaries were examined regarding their size, shape, thickness of peripheral follicles.

Peritubal, periovarian and omental adhesions, tubo-ovarian masses, endometriotic deposits, fibroid, presence of fluid in the Pouch of Douglas or any other pathology, if present was noted. The patency of fallopian tubes was ascertained by injecting methylene blue or Gentian violet into the uterine cavity and its spill through the fimbrial ends was checked. Variables were age, primary and secondary infertility, duration of infertility, tubal patency

(yes or no), bilateral tubal block and unilateral tubal block. The study protocol was approved by the Institutional ethics committee. Patients were enrolled after having provided their informed written consent.

RESULTS

There were 35 (58.3%) cases of primary infertility and 25 (41.7%) cases of secondary infertility. 80% women were in the age group of 21 to 30 years (Table 1).

Table 1: Age distribution in cases of primary and secondary infertility.

Age (years)	Primary infertility		Secondary infertility		Total	
	No.	%	No.	%	No.	%
21-25	21	35.0	05	8.3	26	43.3
26-30	08	13.3	14	23.3	22	36.7
>= 30	06	10.0	06	10.0	12	20.0
Total	35	58.3	25	41.7	60	100

In 49% of women, the duration of infertility was between 2 to 4 years whereas 23% cases had been infertile for 5 to 6 years (Table 2). 64% women had regular menstruation while 36% had irregular cycles (Table 2).

Table 2: Duration of infertility.

Duration of infertility	No. of Patients	%
2-4 years	29	49
5-6 years	14	23
Above 6 years	17	28
Total	60	100

Diagnostic laparoscopy and findings of chromopertubation revealed unilateral blockage in 37% of cases, bilateral blockage had seen in 23% of cases, endometriosis was seen in 9% of cases, adhesion in 7% of cases, hydrosalpinx in 10% of cases and tubo-ovarian mass in 3% of cases (Table 3).

Table 3: Findings of diagnostic laparoscopy and chromopertubation.

Tubal Factors	Number	%
Unilateral blockage	22	37
Bilateral blockage	14	23
Endometriosis	09	15
Adhesion	07	12
Hydrosalpinx	06	10
Tubo-ovarian mass	02	03
Total	60	100

Out of total 22 cases of unilateral blockage, 11 (50%) cases has proximal tubal blockage and 9 (41%) cases had distal tubal blockage. Only 2 cases had bipolar tubal blocks. Out of total 14 cases of bilateral blockage, 8

(57%) cases had Pelvic Inflammatory Disease (PID) and 6 (43%) cases had tuberculosis. Out of 60 cases, 45 had tubal factors of infertility in pelvic inflammatory disease. Out of 45, 22 cases (49%) had unilateral blockage and 8 cases (17%) had bilateral blocks followed by hydrosalpinx, peritubal adhesions, adhesions in pouch of Douglas and tubo-ovarian mass in 13%, 11%, 5% and 5% respectively.

Table 4: Tubal factors of infertility in pelvic inflammatory disease.

	Number	%
Unilateral blocks	22	49
Bilateral blocks	08	17
Hydrosalpinx	06	13
Peritubal adhesions	05	11
Adhesion in pouch of Douglas	02	05
Tubo-ovarian mass	02	05
Total	45	100

DISCUSSION

In present study diagnostic laparoscopy and findings of chromopertubation revealed unilateral blockage in 37% of cases, bilateral blockage had seen in 23% of cases. In Shetty SK et al tubal pathology was detected in 66% cases and bilateral tubal block in 8% cases and unilateral block in 28% cases.⁹ These observations illustrate that the prevalence of tubal pathology in women complaining of infertility is high in our community. In Ikechebelu JI et al, 39.5% women had normal patent tubes while (60.4%) had tubal pathologies like bilateral tubal occlusion in (38.3%) and unilateral tubal occlusion in (22.1%) women.¹⁰

In present study, out of total 22 cases of unilateral blockage, 11 (50%) cases has proximal tubal blockage and 9 (41%) cases had distal tubal blockage. Only 2 cases had bipolar tubal blocks. Out of total 14 cases of bilateral blockage, 8 (57%) cases had Pelvic Inflammatory Disease (PID) and 6 (43%) cases had tuberculosis. In Shetty SK et al, nonspecific pelvic inflammatory disease was observed in 15 (44%) cases in primary infertility and 8 (50%) cases in secondary infertility whereas Aziz N et al, Pelvic inflammatory disease was reported in 1 (3.1%) and 2 (16.7%) cases of primary and secondary infertility respectively.^{9,11} The common finding was tubal blockage in 7 (21.9%) and 6 (33.3%) cases of primary and secondary infertility respectively. After one episode of PID, a woman has an estimated 15% chance of infertility. After two episodes, the risk rises to 35%. After three episodes, the risk for infertility is nearly 75%.

In present study, endometriosis was seen in 9% of cases, adhesion 7% of cases, hydrosalpinx in 10% of cases and tubo-ovarian mass in 3% of cases. In Shetty SK et al, endometriosis was observed in 12 (24%) cases but significant peritubal adhesions were found in 4 (8%)

cases whereas Aziz N et al reported endometriosis in 6 (12%) cases and peritubal and peri-ovarian adhesions in 6 (12%) cases.^{9,11}

In present study out of total 14 cases of bilateral blockage, 8 (57%) cases had Pelvic Inflammatory Disease (PID) and 6 (43%) cases had tuberculosis. In Shetty SK et al, the diagnosis of genital tuberculosis was made by laparoscopy in 1 (2%) cases.⁹ Bilateral tubal block was seen in the case. Sharma JB et al studied laparoscopic findings in genital TB in 47.1% cases.¹² Genital tuberculosis is common in India and a combination of clinical and laparoscopic diagnoses, along with endometrial histopathologic studies, acid-fast bacillus culture, and polymerase chain reaction assays provides the best available method for the diagnosis of genital tuberculosis in infertile women.¹³ However, study done in single college of Gandhinagar city limits us to generalize the results. There is definitely a need for well-planned, large-scale studies to evaluate the role of laparoscopy in diagnosis of infertile women with tubal factors.

CONCLUSION

Unilateral and bilateral tubal blockade was detected in 60% of cases of infertile women in this study. These observations suggest that the use of laparoscopy and chromopertubation test should be recommended as a first step in the investigation of infertile women with tubal factor.

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Conflict of interest: None declared

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

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