

Research Article

Diagnostic Laparoscopy in Infertility - A Retrospective study

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Abstract

Background: Infertility affects approximately 10% of the population. One third (30%) of infertility can be attributed to male factors, and about one third (30%) can be attributed to female factors. In about 20% of cases infertility is unexplained, and the remaining 10% of infertility is caused by a combination of problems in both partners. Diagnostic laparoscopy is the gold standard in diagnosing tubal pathology and other intra-abdominal causes of infertility.

Objective: To evaluate the role of laparoscopy in the diagnosis of infertility.

Study design: Retrospective study.

Setting: Department of Obstetrics and Gynaecology, K.S. Hegde Charitable hospital, Mangalore from July 2006 to December 2007.

Methods: Fifty infertile women underwent diagnostic laparoscopy during the study period. Couples who had not lived together for at least 12 months, and those with male factor infertility were excluded. Laparoscopy was scheduled in the proliferative phase of the menstrual cycle.

Results: Of the fifty women studied, 34 (64%) had primary infertility while 16 (36%) secondary infertility. Laparoscopy revealed normal findings in 8 (23.5%) with primary infertility and 2 (12.5%) with secondary infertility. The common finding was tubal blockage in 9 (26.5%) and 4 (25%) of primary and secondary infertility respectively. Polycystic ovaries were detected in 4 (11.7%) of primary infertility and 1 (6.25%) in secondary infertility. Endometriosis was found in 5 (14.7%) with primary infertility and 1 (6.25%) in secondary infertility group. Pelvic inflammatory disease (PID) was found in 1 (2.9%) and 3 (18.7%) of primary and secondary infertility respectively. Peritubal and periovarian adhesions were detected in 3 (8.8%) with primary infertility and 3 (18.7%) in secondary infertility. Fibroids were found in 3 (8.8%) and 1 (6.25%) in primary and secondary infertility respectively. Ovarian cyst detected in 1 (2.9%) in primary infertility and 1 (6.25%) in secondary infertility.

Conclusion: The most common cause responsible for infertility was tubal occlusion in both primary and secondary infertility group. Laparoscopy is necessary in establishing diagnosis of female infertility.

Keywords: causes; diagnostic laparoscopy; primary infertility; secondary infertility

1. Introduction

Infertility is defined as failure to conceive during one year of unprotected frequent intercourse.¹ Leading causes of infertility include tubal disease, ovulatory disorders, uterine or cervical factors, endometriosis and male factor infertility.^{1,2,3} Major causes according to WHO on a global basis are malnutrition, pelvic tuberculosis and puerperal infections leading to tubal blockage.⁴

Laparoscopy is an essential step and a standard procedure in the investigation and evaluation of infertile females before initiating infertility treatment.^{5,6} In the absence of clinical signs and symptoms suggestive of a diagnosis; laparoscopy

offers an excellent means through direct visualization to elucidate the hidden pathology. It has got an advantage of direct visualization of the pelvic organs and the peri-tubal status resulting in greater information as compared to hysterosalpingography and ultrasonography.⁷ The advance in instrument technology has made this procedure more productive and less hazardous. Laparoscopy is the most dependable tool to investigate pelvic pathology. The objective of our study was to highlight the role of laparoscopy in establishing diagnosis of female infertility.

2. Materials and Methods

Fifty patients admitted to the Obstetrics and Gynaecology unit of K.S. Hegde Charitable hospital, between July 2006 and December 2007 were included in this retrospective study. The patients having cardiac disease, documented H/o genital tuberculosis, were excluded from the study. Patients with all contraindications as related to procedure of laparoscopy like generalized peritonitis, bowel obstruction, and large pelvic mass were also excluded from the study. The informed consent of all the patients was obtained and the study was approved by the institutional ethical committee. Apart from complete history, general physical examination, baseline investigations and semen analysis were performed. The ECG and chest X-ray were done if required, for pre-anesthetic evaluation. Patients' details were collected on a pre-designed proforma regarding age of marriage and duration of infertility. Laparoscopic findings and complications of laparoscopy were documented.

3. Methodology

The laparoscopic examination was performed under general anesthesia, in the proliferative phase of the menstrual cycle. After creating a pneumoperitoneum, a thorough inspection of the pelvis, was performed, followed by testing of the Fallopian tube patency using Methylene blue. A dilute solution of Methylene blue was injected through the cervix via a Rubin cannula. The presence of adhesions, structural abnormalities of the uterus, endometriosis and fallopian tubal occlusions were noted. Patients were discharged after 24 hours of observation, if stable.

4. Results

Of the fifty women who underwent diagnostic laparoscopy, 34 (68%) had primary infertility and 16 (32%) had secondary infertility. In primary infertility, most of the patients were in the age group of 25 to 30 years - 14 (41.2%) and >30 years in secondary infertility - 8 (50%) patients. The mean age at presentation was 28.3 years and 31.8 years for primary and secondary infertility respectively (**Table-1**). The duration of infertility ranged from 1.5 to 12 years. Maximum number of cases had duration of infertility between 2 to 4 years in both, primary infertility group 16 (47.1%) and secondary infertility group 7 (43.7%). The mean duration of infertility was found to be 4.8 years in primary infertility and 4.2 years in secondary infertility (**Table-2**).

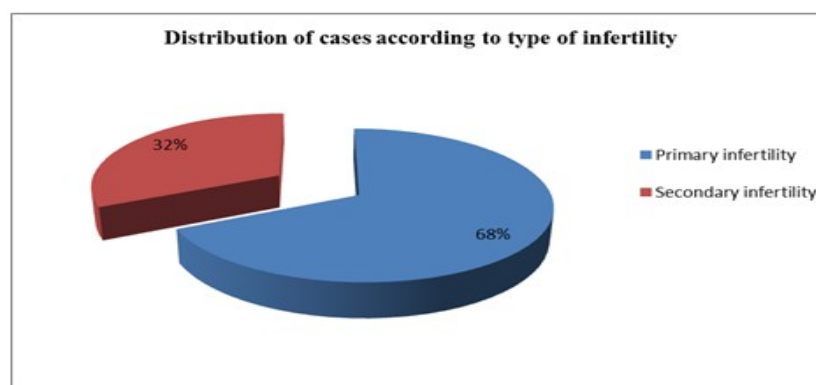


Table-1: Age groups of women with infertility at time of laparoscopy

| Characteristics | Primary infertility (34) | | Secondary infertility (16) | |
|-----------------|--------------------------|------|----------------------------|------|
| | N | % | n | % |
| Age (years) | | | | |
| <20 | 0 | 00.0 | 0 | 00.0 |
| 20-25 | 9 | 26.4 | 1 | 6.25 |
| 25-30 | 14 | 41.2 | 7 | 43.7 |
| >30 | 11 | 32.4 | 8 | 50.0 |

Table-2: Duration of infertility at time of presentation

| Duration of infertility (years) | Primary infertility (34) | | Secondary infertility (16) | |
|---------------------------------|--------------------------|------|----------------------------|------|
| | N | % | n | % |
| <2 | 1 | 2.9 | 2 | 12.5 |
| 2-4 | 16 | 47.1 | 7 | 43.7 |
| 4-6 | 9 | 26.5 | 6 | 37.5 |
| >6 | 8 | 23.5 | 1 | 6.25 |

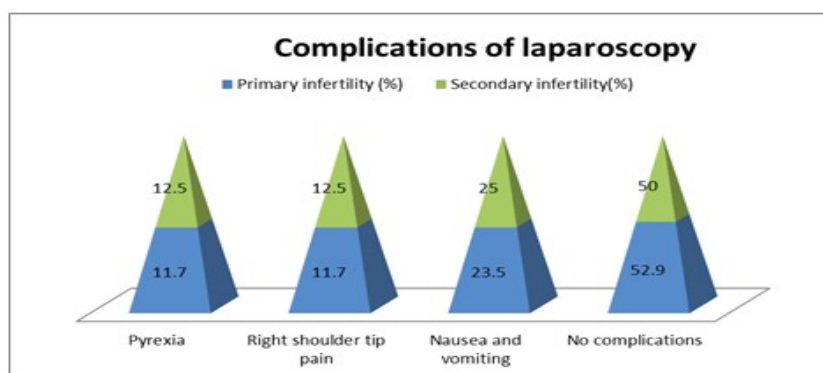
Among the 34 patients with primary infertility, 8 (23.5%) had no other symptoms. Twenty six patients (81.25%) presented with various symptoms - dysmenorrhea in 10 (29.4%) was the commonest, followed by pelvic pain in 4 (11.7%), dyspareunia in 4 (11.7%), 4 (11.7%) had irregular cycles, 2 (5.8%) presented with hirsutism, 1(2.9%) each with secondary amenorrhea and menorrhagia respectively. Among the 16 patients with secondary infertility, 3 (18.7%) were asymptomatic, while dyspareunia was the commonest symptom in 6 (37.5%) and 1 (6.25%) had pelvic pain. Other symptoms like dysmenorrhea was seen in 3 (18.7%), 2 (12.5%) had history of irregular cycles. Hirsutism was present in 1 (6.25%) case.

Various causes found in infertility are shown in (**Table-3**). Laparoscopy revealed normal findings in 10 out of 50 patients, 8 (23.5%) with primary infertility and 2 (12.5%) with secondary infertility. Abnormal findings were present in 40 (80%) patients. The common finding was tubal blockage in 9 (26.5%) and 4 (25%) of primary and secondary infertility respectively. Polycystic ovaries were detected in 4 (11.7%) of primary infertility and 1(6.25%) in secondary infertility. Endometriosis was found in 5 (14.7%) with primary infertility and 1 (6.25%) in secondary infertility group. Pelvic inflammatory disease (PID) was found in 1 (2.9%) and 3 (18.7%) of primary and secondary infertility respectively. Peritubal and periovarian adhesions were detected in 3 (8.8%) with primary infertility and 3(18.7%) in secondary infertility. Fibroids were found in 3 (8.8%) and 1 (6.25%) in primary and secondary infertility respectively. Ovarian cyst detected in 1 (2.9%) in primary infertility and 1(6.25%) in secondary infertility.

Table-3: Laparoscopic findings regarding cause of female infertility

| Findings | Primary infertility (34) | | Secondary infertility (16) | |
|-------------------------------------|--------------------------|------|----------------------------|------|
| | N | % | n | % |
| Normal | 8 | 23.5 | 2 | 12.5 |
| Tubal occlusion | 9 | 26.5 | 4 | 25.0 |
| Polycystic ovaries | 4 | 11.7 | 1 | 6.25 |
| Peritubal and periovarian adhesions | 3 | 8.8 | 3 | 18.7 |
| Endometriotic deposits | 5 | 14.7 | 1 | 6.25 |
| PID | 1 | 2.9 | 3 | 18.7 |
| Fibroid | 3 | 8.8 | 1 | 6.25 |
| Ovarian cyst | 1 | 2.9 | 1 | 6.25 |

The most common cause observed by laparoscopy was tubal occlusion (26%). This was followed by endometriosis (14.7%) and polycystic ovaries (11.7%) in case of primary infertility while peritubal and periovarian adhesions (18.7%) and pelvic inflammatory disease (18.7%) were the second most common causes in secondary infertility. There were no complications in 52% of primary and 50% patients with secondary infertility groups. The most common complications were pyrexia, shoulder tip pain, nausea and vomiting.



5. Discussion

In everyday clinical practice, it is not always clear if and when exactly in the fertility work-up a diagnostic laparoscopy should be offered. There is a need for more randomized controlled trials to answer remaining questions regarding its value in the diagnosis and treatment of some patients with infertility.⁸

Traditional way to assess the uterine cavity, tubal structure and tubal patency was hysterosalpingography but it has now been largely superseded by laparoscopy and hysteroscopy. In one study, in presence of normal HSG, laparoscopy identified pelvic disease in about half of patients.⁹

In the present study, laparoscopy was done to study its role in diagnosis of various causes of female infertility. Of fifty women studied over a span of one and a half years, 34 (68%) presented with primary infertility and 16 (32%) with secondary infertility. The mean age at presentation was 28.3 years in primary infertility and 31.8 years in secondary infertility group, similar results were observed in Boricha *et al* study.¹⁰

Various studies have shown that there is rise in age at which women presented with infertility. In our study, 4 (12.5%) presenting with primary infertility and 5 (31.25%) with secondary infertility were of age > 35 years. Because of the decline in fertility and the increased time to conception that occurs after the age of 35, women > 35 years of age should be referred for infertility work-up after 6 months of trying to conceive.¹¹

The duration of infertility was 2-4 years in the majority of patients (47.1%) in primary infertility and (43.7%) in secondary infertility. The mean duration of infertility was found to be 4.8 years in primary infertility and 4.2 years in secondary infertility. Similar results were observed in Boricha *et al*.¹⁰

Major symptoms were dysmenorrhea, pelvic pain, dyspareunia, which are in accordance with other studies.¹² These symptoms were found to be frequently associated with organic pelvic pathology. The diagnostic laparoscopy should be considered early in symptomatic patients during infertility workup.¹⁴ Studies have shown that the history of dysmenorrhea or dyspareunia increased the likelihood of detecting endometriosis from 41% to 64% and 69% respectively. The presence of both symptoms increased the likelihood to 83%.³

The most common cause of infertility observed by laparoscopy was tubal occlusion (26%). This was followed by endometriosis (14.7%) and polycystic ovaries (11.7%) in primary infertility while peritubal and periovarian adhesions (18.7%) and pelvic inflammatory disease (18.7%) in cases of secondary infertility respectively which correlated with other studies.^{4, 12}

Tubal factors accounts for up to 40% of infertility with varied and diverse etiologies. Pelvic-peritoneal adhesions (mostly sequels of prior infections from organisms like Chlamydia trachomatis and Neisseria gonorrhea) constitute the single most common class of tubal pathology responsible for tubal infertility.¹⁵ They cause anatomic and physiological compromise of tubal functions of ovum pick-up, fertilization and zygote transport between the ovary and the uterus in the normal process of procreation.^{16,17} In our study, tubal blockage was present in present in 26.5% in the primary group and 8.8% in the secondary infertility group and peritubal and periovarian adhesions in 25% and 18.7% of primary and secondary infertility respectively.

A meta-analysis of 20 studies comparing HSG and laparoscopy for tubal patency and peritubal adhesions showed that HSG is of limited use for detecting tubal patency because of its low sensitivity, though its high specificity makes it a useful test for confirming the presence of tubal obstruction. For the evaluation of tubal patency and peritubal adhesions, but especially endometriosis, HSG is not reliable and requires laparoscopy.¹⁸ Laparoscopy still reveals tubal pathology or endometriosis in 35–68% of cases, even after normal HSG.^{9, 18}

Tubal blockage represents the aftermaths of pelvic infection or surgery. A single episode of Pelvic inflammatory disease carries up to 10% risk of future tubal factor infertility.¹⁹ In the present study, it was observed in 2.9% of primary and 18.7% in secondary infertility while in the study of Raida M and co-workers, PID was found in 2.13% of primary and 5.08% of secondary infertility patients.²⁰

Polycystic ovaries were detected in (11.7%) and (6.25%) in primary and secondary infertility group respectively. Polycystic ovary syndrome is the most common cause of an ovulatory infertility. In the study by Nazand colleagues, PCO

(polycystic ovaries) were detected in (8.82%) and (3.5%) cases of primary and secondary infertility respectively.³

In the present study, endometriosis was found in 5 (14.7%) with primary infertility and 1 (6.25%) in secondary infertility. Endometriosis was determined to have a rate of 15% in the primary infertility group and 11.5% in the secondary infertility group in A Göçmen and T Atak study.²¹ Women who have been diagnosed with endometriosis are more likely to experience infertility, and observational studies have shown that the monthly probability of pregnancy in women with endometriosis is about half of the probability in normal women. In spite of this well documented association, a true cause and effect relationship has not been established.²²

In the present study, fibroids were observed in 8.8% and 6.25% cases of primary and secondary infertility respectively which correlated with Aziz N study.¹² The incidence of myoma in women with infertility without any obvious cause of infertility is estimated to be 1-2.4%.²³

The incidence of postoperative complications with laparoscopy is very low which corresponds with the findings of other national and international studies.^{24,25}

6. Conclusion

Tubal disease is a common factor responsible for infertility in both primary and secondary infertility in our study. Laparoscopy is necessary for diagnosis of tubal and pelvic factors and in evaluating the patency of the tube. It also helps in assessing the uterine and ovarian status. Hence laparoscopy plays an important role in diagnosis of infertility and planning the management.

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