



## Diagnostic Laparoscopy in the Evaluation of Female Factors in Infertility in Kashmir Valley

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### Abstract

**Objectives:** To evaluate the female factors in infertility using laparoscopy in Kashmiri women.

**Materials and Methods:** One hundred cases of infertility [primary and secondary] were included in this prospective study. Before the procedure, apart from complete history and detailed examination, baseline investigations (complete blood count, blood sugar, kidney and liver function tests, ECG, chest X-ray) were performed as per our institutional protocol for pre-anaesthesia check up. Laparoscopy was done in proliferative phase of menstrual cycle. To test the patency of tubes, chromotubation was done in all cases under laparoscopic vision by using 10-15 ml of autoclaved methylene blue dye. All the data was collected on pre-designed proforma and the results were tabulated and raw percentages calculated to describe the results.

**Results:** In primary infertility group [n=82], most common laparoscopic finding was tubal occlusion in 15 (18.3%), followed by endometriotic deposits in 14 (17.1%) patients. Other findings were polycystic ovaries in 10 patients (12.2%), peritubal and periovarian adhesions in 6 patients (7.3%), fibroids in 6 patients (7.3%), genital tract tuberculosis in 5 patients (6.1%), ovarian cysts in 4 patients (4.8%), hypoplastic uterus in 2 patients (2.4%) and pelvic inflammatory diseases in 2 patients (2.4%), in this group. The commonest finding by laparoscopy in patients with secondary infertility [n=18] was tubal occlusion in 5 (27.7%), followed by peritubal and periovarian adhesions in 4 (22.2%) patients.

**Conclusion:** laparoscopy is very effective and cheap method in evaluating infertile women and should be considered earlier in infertility workup for effective and early treatment decisions.

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**Introduction:**

Infertility is best defined as the inability to conceive after one year of unprotected regular intercourse (1,2). Based on this, 60–80 million couples all over the world can be labelled as suffering from infertility (3). Estimates of infertility vary widely among Indian states from 3.7 per cent in Uttar Pradesh, Himachal Pradesh and Maharashtra (4), to 5 per cent in Andhra Pradesh (5) and 15 per cent in Kashmir (6). Infertility affects men and woman alike, as both genders report associated psychological distress, depression and low self-esteem (7,8). In many cultures, the social repercussions of infertility compound the individual impact. Infertility has been observed to result in divorce, loss of economic resources, and even the annulment of rights to burial grounds (9).

The common factors responsible for infertility in females are anovulatory disorder, tubal factors, endometriosis, uterine and cervical factors (10). Untreated pelvic inflammatory diseases (PID), post-abortal, postpartum infections and tuberculosis are common factors of infertility in developing countries (11). Conventional way to assess the uterine cavity, tubal structure and tubal patency was Hysterosalpingography but it has now been largely superseded by laparoscopy and hysteroscopy. Advances in endoscopic surgery have revolutionized the approaches of obstetricians for diagnosis and management of patients with infertility. Laparoscopy is the standard means of diagnosing the tubal pathology, peritoneal factors and endometriosis and intra-abdominal causes of infertility. Not only does this help in identification of unsuspected pelvic pathology but also contributes to decision making of infertility treatment.

In Kashmir most of the patients are illiterate and from low socioeconomic status. They go to untrained health practitioners for the infertility treatment, which leads to delay in proper management. The role of laparoscopy in the diagnosis of primary and secondary infertility is established beyond any doubt. An effort was made to evaluate the female factors in infertility in Kashmiri

women using laparoscopy and to detect the diagnostic efficacy of laparoscopy.

**Material & Methods:**

This prospective study was conducted in the department of Obstetrics and Gynaecology, Sher-i-Kashmir Institute of Medical Sciences Medical College Hospital, Srinagar, Jammu and Kashmir, India from December 2011 to April 2013 after approval from the human ethical committee of our institute. One hundred eleven (111) infertile patients attended the gynaecology department of our institute from December 2011 to April 2013. One hundred cases of infertility (primary and secondary) were selected for diagnostic laparoscopy. Those patients who had absolute or relative contraindications for anaesthesia or laparoscopy were excluded from the study. Proper informed written consent was taken from every patient. All the patients were admitted in the ward one day prior to procedure. Before the procedure, apart from complete history and detailed examination, baseline investigations (complete blood count, blood sugar, kidney and liver function tests, ECG, chest X-ray) were performed as per our institutional protocol for pre-anaesthesia check up. Laparoscopy was done in proliferative phase of menstrual cycle. To test the patency of tubes, chromotubation was done in all cases under laparoscopic vision by using 10-15 ml of autoclaved methylene blue dye. All the data was collected on pre-designed proforma and the results were tabulated and raw percentages calculated to describe the results.

**Results:**

We studied one hundred cases of female infertility comprising of 82 (82%) cases of primary and 18 (18%) cases of secondary infertility. 38 (46.3%) cases of primary infertility were in the age group of 20-30 years followed by 29 (35.4%) cases in the age group of 31-40 years. In secondary infertility group 11 (61.1%) cases were in the age group of 31-40 years and 7 (38.8%) cases in 20-30 years age group. The mean age at presentation in our study was 25 years in primary and 31 years in secondary infertility group (Table 1).

The duration of infertility ranged from 1-15 years. The mean duration of infertility was 4.6 years in primary and 5.2 years in secondary infertility group. Maximum number of cases had duration of infertility between 1-5 years, in both primary infertility group- 41 cases (50%) and secondary infertility group- 10 cases (55.5%) (Table 2).

Fourteen patients (17.1%) of primary infertility group were asymptomatic. The main associated symptoms in this group were dysmenorrhea in 32 (39.02%), dyspareunia in 13 (15.8%), chronic pelvic pain in 9 (10.9%), menorrhagia in 5 (6.09%) and hirsutism in 2 (2.4%) patients. Among the 18 patients with secondary infertility, 4 patients (22.2%) were asymptomatic. In this group, the main associated symptom was dyspareunia in 6 (33.3%) patients. Other symptoms like irregular cycles were seen in 2 patients (11.1%), dysmenorrhea in 2 patients (11.1%), menorrhagia in 2 patients (11.1%), chronic pelvic pain in 1 patient (5.5%) and hirsutism in 1 patient (5.5%) in this group (Table 3).

Laparoscopy did not demonstrate evidence of any pathology in 20 (20%) patients out of 100 patients in our study. In primary infertility group, most common laparoscopic finding was tubal occlusion in 15 (18.3%), followed by endometriotic deposits in 14 (17.1%) patients. Other findings were polycystic ovaries in 10 patients (12.2%), peritubal and periovarian adhesions in 6 patients (7.3%), fibroids in 6 patients (7.3%), genital tract tuberculosis in 5 patients (6.1%), ovarian cysts in 4 patients (4.8%), hypoplastic uterus in 2 patients (2.4%) and pelvic inflammatory diseases in 2 patients (2.4%), in this group. The commonest finding by laparoscopy in patients with secondary infertility was tubal occlusion in 5 (27.7%), followed by peritubal and periovarian adhesions in 4 (22.2%) patients (Table 4).

There were no complications in 37 (45.1%) and 6 (33.3%) patients of primary and secondary infertility respectively. The complications after laparoscopy in our study are shown in Table 5. All the complications were of mild grade and did not require any active intervention.

## Discussion:

The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility (12). Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide (13,14). The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent (12). The female factors contribute most (i.e. 40-55%) in the etiologies of infertility followed by male factors (30-40%), both partners (10%) and unexplained (10%) (15). Infertility rates in Kashmir are very high as compared to other states of India (6).

The mean age at presentation in our study was 25 years in primary and 31 years in secondary infertility. Many studies in the literature have shown that there is rise in age at which women presented with infertility. In our study, 29 (35.4%) patients presenting with primary and 11 (61.1%) patients 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 (16). The duration of infertility was 1-5 years in the majority of patients (50%) in primary and (55.5%) in secondary infertility. The mean duration of infertility was found to be 4.6 years in primary and 5.2 years in secondary infertility. Boricha *et al* observed similar results (17).

Major symptoms in our study were dysmenorrhoea, dyspareunia and irregular cycles, which are in accordance with other infertility studies (18). 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 (19).

Tubal disease accounts for 15-20% of cases of primary infertility and approximately 40% of secondary infertility (20). Pelvic-peritoneal adhesions (mostly sequels of prior infections from organisms like *Chlamydia trachomatis* and *Neisseria gonorrhoea*) constitute the single most common class of tubal pathology

responsible for tubal infertility (21). They cause anatomic and physiological dysfunction of tubes and prevent ovum pick-up, fertilization and zygote transport between the ovary and the uterus in the normal process of procreation (22,23). In our study, tubal blockage was present in 18.3% in the primary and 27.7% in the secondary infertility group and peritubal and periovarian adhesions in 7.3% and 22.2% of primary and secondary infertility respectively.

In the United States, more than 1 million women are treated for PID every year, and 200,000 to 300,000 of them require hospitalization. The situation is even worse in developing countries where health care is not readily accessible. A single episode of PID carries up to 10% risk of future tubal factor infertility. In our study, PID was present in 2.4% and 11.1% cases of primary and secondary infertility respectively. In the study conducted by Raida M and co-workers, PID was found in 2.13% of primary and 5.08% of secondary infertility patients (24). In our study, pelvic inflammatory diseases (PID) and tubal blockage were more frequently found in secondary infertility as compared to primary infertility. Talat N *et al* (25) have reported same results.

Polycystic ovarian disease causes hormonal imbalance in women that is thought to be one of the leading causes of female infertility. Polycystic ovarian syndrome causes more than 75% of cases of anovulatory infertility (26). The prevalence of polycystic ovarian disease (PCOD) in asymptomatic women is thought to be between 16 and 33% (27). The incidence of polycystic ovaries in our study was 12.1% in case of primary infertility and no case of it was found in secondary infertility group.

The incidence of myoma in women with infertility without any obvious cause of infertility is estimated to be 1-2.4% (28). In our study, fibroids were seen in 7.3% and 5.5% cases of primary and secondary infertility respectively that correlated with study conducted by Aziz N *et al* (29).

Although exact prevalence of endometriosis in general population of reproductive age is not known, it is believed to be in the range of 3-10% (30). In our study, endometriosis was

seen in 17.1% and 11.1% cases of primary and secondary infertility respectively. Muzii L *et al* in their study demonstrated that endometriosis occurs three times more often in patients with primary infertility than in patients with secondary infertility (31).

Genital tuberculosis is an important cause of infertility especially in endemic zones. Genital tuberculosis not only causes tubal obstruction and dysfunction but also impairs implantation due to endometrial involvement and ovulatory failure from ovarian involvement (32). The prevalence of female genital tract tuberculosis in infertility clinics shows marked variations in different countries ranging between 15 and 25% (33). Our study revealed genital tract tuberculosis in 6.1% and 5.5% cases of primary and secondary infertility respectively. In our study, hypoplastic uterus was seen in 2 (2.4%) patients of primary infertility.

Laparoscopy was not able to demonstrate any pathology in 20 (20%) cases out of 100 cases in our study. Out of these, 4 patients were diagnosed as having male factor infertility on subsequent follow up. 16 (16%) patients had unexplained infertility with no obvious cause seen. Present study correlated with observations of the other studies (17) suggesting that laparoscopy was useful in achieving correct diagnosis in majority of the patients. In our study, laparoscopy was able to correctly diagnose pathology in 62 (75.6%) patients.

In 2007, Nakagawa K *et al* strongly recommended diagnostic laparoscopy for unexplained infertile patients because of the high rate of abnormal findings (87%) on laparoscopy (34). In a cross-sectional study in 2009, Kahyaoglu S *et al* evaluated the treatment strategy change after diagnostic laparoscopy for primary and secondary unexplained infertile patients. The rate of pelvic abnormalities related to infertility was found to be 60% and 69% among primary and secondary infertile patients that was reflected with a rate of 43% and 49% of treatment strategy change following laparoscopy respectively (35).

The incidence of postoperative complications with laparoscopy in our study was very low which corresponds with the

findings of few other national and international studies (36,37,38). There were no complications in 37 (45.1%) and 6 (33.3%) patients of primary and secondary infertility respectively. All the complications were of mild grade and did not require any active intervention.

Diagnostic laparoscopy by direct visualization of pelvic structures facilitates identification of etiology which commonly includes endometriosis, adhesions, ovarian cysts or pelvic inflammatory diseases, so that a therapeutic intervention can be initiated, while avoiding potentially ineffective or unnecessary empiric medical treatment for ovulation induction. In some patients, diagnostic laparoscopy alters treatment plans, including earlier utilization of assisted reproductive technology. Thus, diagnostic laparoscopy can be safely used earlier in the evaluation of infertile females.

### **Conclusion :**

Keeping in view the high infertility rates and illiteracy in our region, proper guidance and education of infertile females is needed to consult earlier at proper infertility clinics. Laparoscopy is very effective method in evaluating these infertile women to prevent delay in management. Diagnostic laparoscopy should be considered earlier in women with history of pelvic inflammatory diseases, pelvic surgery and chronic pelvic pain for effective treatment decisions. It may be considered in appropriately selected infertile patients even after normal findings, as important pelvic pathology may be identified in a significant number of patients. It is most useful in diagnosing cases with endometriosis and tubal factor infertility.

### **Conflicts of interest:**

We declare that no conflicts of interests exist regarding the material in this manuscript.

### **Acknowledgments:**

We have no acknowledgements to disclose.

**Table 1.** Various age groups analyzed in the study and their respective percentages of infertility occurrence.

Age group (yrs)	Primary infertility (n=82)		Secondary infertility (n=18)	
	(no)	(%)	(no)	(%)
<20	15	18.3	0	0
20-30	38	46.3	7	38.8
31-40	29	35.4	11	61.1

**Table 2.** Distribution of cases according to duration of infertility at the time of presentation.

Duration of infertility (yrs)	Primary infertility (n=82)		Secondary infertility (n=18)	
	(no)	(%)	(no)	(%)
1-5	41	50	10	55.5
6-10	35	42.7	5	27.7
11-15	6	7.3	3	16.6

**Table 3.** Presenting symptoms of patients analyzed in the study and their respective percentages in primary and secondary infertility groups.

Symptoms	Primary infertility (n=82)		Secondary infertility (n=18)	
	(no)	(%)	(no)	(%)
Irregular cycles	7	8.5	2	11.1
Dysmenorrhea	32	39.02	2	11.1
Dyspareunia	13	15.8	6	33.3
Chronic pelvic pain	9	10.9	1	5.5
Menorrhagia	5	6.09	2	11.1
Hirsutism	2	2.4	1	5.5
Asymptomatic	14	17.1	4	22.2

**Table 4.** Findings on diagnostic laparoscopy in the study and their respective percentages in primary and secondary infertility groups.

Findings on Diagnostic laparoscopy	Primary infertility (n=82)		Secondary infertility (n=18)	
	(no)	(%)	(no)	(%)
No pathology demonstrated	18	21.9	2	11.1
Tubal occlusion	15	18.3	5	27.7
Peritubal/Periovarian adhesions	6	7.3	4	22.2
Ovarian cysts	4	4.9	1	5.5
Endometriotic deposits	14	17.1	2	11.1
Genital tract tuberculosis	5	6.1	1	5.5
Hypoplastic uterus	2	2.4	0	0
Fibroids	6	7.3	1	5.5
Polycystic ovaries	10	12.2	0	0
Pelvic inflammatory diseases	2	2.4	2	11.1

**Table 5.** Complications after diagnostic laparoscopy in the study and their respective percentages in primary and secondary infertility groups.

Complications after laparoscopy	Primary infertility (n=82)		Secondary infertility (n=18)	
	(no)	(%)	(no)	(%)
Nausea/vomiting	19	23.17	5	27.7
Fever	11	13.41	3	16.6
Surgical emphysema	2	2.4	1	5.5
Shoulder tip pain	9	10.9	2	11.1
Abdominal pain	4	4.8	1	5.5
No complications	37	45.1	6	33.3

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