

The Study of Laparoscopic Finding in Infertility Cases

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Abstract

Introduction: One of the most important and under appreciated reproductive health problems in developing countries is the high rate of infertility and childlessness. The inability to procreate is frequently considered a personal tragedy and a curse for the couple, impacting on the entire family and even the local community. Negative psychosocial consequences of childlessness are common and often severe. About 20% of all patients diagnosed with polycystic ovarian syndrome (PCOS) and infertility, will not ovulate after ovulation induction treatment with clomiphene citrate. Even today, the effective treatment of clomiphene resistant PCOS remains a challenge for the medical profession.

Aim & Objective: Study of laparoscopic evaluation in infertility cases at Panna Dhai Mahila Chikitsalaya, Udaipur.

Material and Methods: Total 100 cases randomly selected attending OBG OPD with both primary and secondary infertility were studied. After taking detailed history, thorough clinical examination, investigations and informed consent diagnostic laparoscopy was done between 7th to 11th day of menses under GA. Patient was discharged on the 2th postoperative day according to her general condition and was followed on 5th postoperative day for stitches removal.

Results: 62 cases were primary infertility and 38 cases were of secondary infertility. Pelvic ultrasonography

was normal in 54 women. 77% of the women reproductive pathology was noted on laparoscopy. 23% women had normal study. In 25% of the women reproductive pathology was freshly detected by laparoscopy, which was missed by other modalities like clinical examination and ultrasound. 20 women conceived during the period of study. Among these 13 (22.14%) women had undergone concurrent therapeutic interventions at laparoscopy conceived during follow-up. 8 conceived spontaneously, 4 women who had polycystic ovaries had undergone ovarian drilling conceived after ovulation induction. One woman conceived with GnRH agonist. 6 women conceived with ovulation induction in subsequent cycles and one woman with unilateral tubal block conceived after hydrotubation in subsequent cycles.

Conclusion: Most effective treatment decisions and interventions can be made in the light of laparoscopic findings in managing infertility. Though laparoscopy is invasive the complications associated with the procedure can be minimized with proper training.

Keywords: Laparoscopy; Infertility; PCOS.

Introduction

One of the most important and under appreciated reproductive health problems in developing countries is the high rate of infertility and childlessness. The inability to procreate is

frequently considered a personal tragedy and a curse for the couple, impacting on the entire family and even the local community. Negative psychosocial consequences of childlessness are common and often severe [1].

Infertility is a common problem in day to day practice and it still continues to baffle the gynaecologist. Being infertile or barren is the biggest social stigma faced by Indian women.

Definition

Infertility is the failure to conceive (regardless of cause) after 1 year of unprotected intercourse. Infertility affects approximately 10-15% of reproductive-aged couples [2]. Its overall prevalence has been stable during the past 50 years; however, a shift in etiology and patient age has occurred. As the woman's age increases, the incidence of infertility also increases.

Causes of female infertility

Major causes of infertility include Ovulatory dysfunction (40%), Tubal and pelvic pathology (40%), Unexplained infertility (10%) and Unusual problems (10%) [2].

Ovarian factor infertility

Anovulation due to endocrine disorders, polycystic ovaries disease (PCOD) and corpus luteal phase defects (LPDs) are some of important causes of infertility. Peri-ovarian adhesion in pelvic infection and luteinized unruptured follicular (LUF) syndrome in 9% cases are also responsible. Resistant ovarian syndrome cause anovulation.

Ovulatory dysfunction defined as an anovulation or Oligovulation. Many of these women have polycystic ovarian syndrome. Resulting in alteration in the frequency and duration of the menstrual cycle. Oligomenorrhea is a dysfunction of the hypothalamus-pituitary-ovarian axis and is the most common ovulatory disorder associated with infertility. Patients may have symptoms of hyperandrogenism, acne, hirsutism and baldness. Obesity is frequently associated and aggravates the prognosis. Although these patients are not sterile, their fertility is decreased, and the obstetrical outcome is poor because of an increased risk of pregnancy loss.

Tubal factors

The fallopian tubes play an important role in reproduction it the sites for fertilization at ampulla

ans transportation of gametes. Abnormalities or damage to the fallopian tube interferes with fertility and is responsible for abnormal implantation (e.g., ectopic pregnancy). Obstruction of the distal end of the fallopian tubes results in accumulation of the normally secreted tubal fluid, creating distension of the tube with subsequent damage of the epithelial cilia (hydrosalpinx).

Other tubal factors associated with infertility are either congenital or acquired. Congenital absence of the fallopian tubes can be due to spontaneous torsion in utero followed by necrosis and reabsorption. Among acquired causes elective tubal ligation, PID, peritubal adhesion, fimbrial end blockage and salpingectomy are acquired causes. Genital tuberculosis, gonorrhoea and chlamydial infections or sapingitis, following septic abortion are among the common causes of tubal block.

Uterine factor infertility

The uterus is the final destination for the embryo where implantation takes place and where the fetus develops until delivery. Therefore, uterine factors may be associated with primary infertility. Uterine factors can be congenital or acquired. They may affect the endometrium or myometrium and are responsible for 2-5% of infertility cases.

- Congenital defects
- Mullerian anomalies like Rokitansky-Küster-Hauser syndrome, arcuate uterus and vaginal septa (transverse or longitudinal).
- Acquired defects.
- Intrauterine and submucosal fibroids are very common, affecting 25-50% of women. They can cause distortion of the cavity and compromise the blood supply and hinder implantation.
- In pelvic tuberculosis, blockage of tubes and endometrial tuberculosis causing Asherman syndrome.

Cervical factor infertility

Cervical factor infertility can be caused by stenosis or abnormalities of the mucus-sperm interaction. Cervical factors account for 5-10% of infertility. Cervical stenosis can be congenital or acquired in etiology, resulting from surgical procedures, infections, hypoestrogenism and radiation therapy. Nonmotile, nonprogressively motile sperms in cervical mucus showing a shaking pattern are highly suspicious of the presence Antisperm antibodies and immunological cause.

Comprehensive Evaluation of Infertility

Evaluation of infertile couples should be organized and thorough. Diagnostic tests should progress from the simplest (e.g. pelvic ultrasonography) to the more complex and invasive (e.g. laparoscopy). The couple may be stressed by their need to seek medical intervention; therefore, to relieve anxiety, emphasize that a complete infertility evaluation is performed according to the woman's menstrual cycle and may take up to 2 menstrual cycles before the etiology is determined.

Laparoscopy in infertility Practice

Laparoscopy was introduced to clinical practice in the early part of this century and its use in gynecology was described in 1967. Laparoscopy is a trans-peritoneal endoscopic technique that provides excellent visualization of pelvic structures and often permits the diagnosis of gynecologic disorders and pelvic surgery without laparotomy [3].

It provides direct visualization of pelvis and complete view of cul-de-sac. Laparoscopy allows for the comprehensive evaluation of the pelvis including confirmation of tubal patency and evaluation of tubo-ovarian relationships. Pelvic adhesions, endometriosis, and tubal disease can be assessed and in most circumstances, simultaneously treated in a relatively non-invasive outpatient procedure [4].

Role of laparoscopy in current fertility practice

Laparoscopy was the final diagnostic procedure of the female fertility exploration, as outlined by the American Fertility Society in 1992 and by the World Health Organization guidelines [5]. Glatstein *et al.* (1997) reported that 89% of all reproductive endocrinologists in the USA routinely performed a laparoscopy in the diagnostic work-up of infertility [6]. However, some investigators showed that the diagnostic laparoscopy did not reveal any pathology or only minimal and mild endometriosis in 40-70% of all cases [7].

Disadvantages of diagnostic laparoscopy include the need for general anaesthesia, patient's anxiety and the possibility of adhesion formation. In a large Finnish follow-up study, the complication rate of diagnostic laparoscopy was 0.6 per 1000 procedures [8]. However, advantages include the possibility to perform both diagnosis and therapy at the same time, and the opportunity to combine the laparoscopy with the hysteroscopic exploration of the uterine cavity with an endometrial biopsy, all as part of day care surgery.

Diagnostic laparoscopy is an essential part of full assessment and treatment of infertility. It provides information regarding tubal status, any pelvic adhesions, ovarian and uterine pathology. Diagnostic laparoscopy is usually performed under general anaesthesia, with endotracheal intubation to minimize the risk of aspiration. However, if the pressure used for peritoneal insufflation is limited, laparoscopy can be performed under conscious sedation [9].

Laparoscopy in PCOS

About 20% of all patients diagnosed with polycystic ovarian syndrome (PCOS) and infertility, will not ovulate after ovulation induction treatment with clomiphene citrate. Even today, the effective treatment of clomiphene resistant PCOS remains a challenge for the medical profession.

In a recent Cochrane review (Farquhar *et al.*, 2005), the efficacy of laparoscopic drilling of the ovarian capsule (laparoscopic ovarian diathermy, LOD) by diathermy or laser in clomiphene resistant PCOS has been compared to gonadotrophin treatment based on a total of 15 RCTs. The reviewer's conclusion is that there is no difference in the live birth rate and the miscarriage rate in women with clomiphene resistant PCOS undergoing LOD when compared with gonadotrophin treatment. However, the reduction in multiple pregnancy rate in women undergoing LOD makes this option attractive [10].

Disadvantages of the LOD procedure include the risks related to laparoscopic surgery, the need for general anaesthesia, the possible risk of thermal damage to adjacent organs and ovarian adhesion formation, and as clearly mentioned in the Cochrane review, the lack of knowledge concerning the possible negative long-term effects of this procedure on the ovarian reproductive function.

Laparoscopic adhesiolysis

Adhesions may form due to prior infection, such as a ruptured appendix or pelvic inflammatory disease (PID), endometriosis, or previous surgery. Peritubal adhesions may impair ovum pick due to decrease in tubal motility. It is said that laparoscopic adhesiolysis might increase the spontaneous pregnancy rates as well as pregnancy rates after IUI [11].

Laparoscopy before IVF treatment

There is a fair degree of consensus that selected adnexal pathology, such as hydrosalpinx and ovarian endometriotic cysts, still have to be treated

by laparoscopic surgery prior to IVF.

With respect to hydrosalpinx, two RCTs have demonstrated increased implantation and pregnancy rates in IVF cycles after salpingectomy for ultrasonographically visible hydrosalpinges. Both these trials have been included in a recent Cochrane review (Johnson *et al.*, 2004). According to the meta-analysis by Johnson *et al.*, 2004, eight women would have to undergo salpingectomy prior to IVF to gain one additional live birth [12]. The adverse effect of hydrosalpinx on ART success rates can be explained by several mechanisms: the direct toxic effect of tubal fluid on the embryos, the negative effect of tubal fluid on the endometrium by flushing out embryos, dilution of implantation factors and prevention of normal embryonic-endometrial apposition [13].

There are no randomized studies comparing the live birth rates after IVF treatment in women who were surgically treated for endometriotic cysts prior to IVF versus women who were not. In a retrospective case-controlled study, Garcia-Velasco *et al.* (2004) demonstrated that laparoscopic removal asymptomatic small endometriotic cysts (<3 cm), immediate proceeding to IVF may reduce the time to pregnancy, treatment costs and the possible detrimental effects of inappropriate surgery on the ovarian function. However, laparoscopic cystectomy of larger symptomatic endometriotic cysts (>4 cm) improves fertility and reduces recurrence of these cysts when compared to cyst drainage and coagulation [14].

Patient risk factors

- *Obesity*- Obesity is a well-recognized factor that increases the risk of any abdominal surgery. For laparoscopy, increased weight takes on a special significance.
- *Age* - Another well-described surgical risk factor is age. As the population ages, more women of increased age will have indications for laparoscopy. Older patients are at increased risk of having concomitant disease processes that affect their perioperative morbidity and mortality.
- *Previous abdominal surgery* - As far as laparoscopic complications are concerned, one of the most important risk factors is a history of previous abdominal surgery. The risk of adhesions of omentum and/or bowel to the anterior abdominal wall after previous abdominal surgery is greater than 20%. Because laparoscopy requires

the insertion of sharp instruments into the abdominal cavity, a reasonable assumption is that previous surgery would increase the risk of bowel injury. Thus, strategies have been developed to decrease the risk of bowel injury in patients with previous abdominal surgery.

The most common of these strategies is the use of an open technique for laparoscopic trocar placement, as first advocated by Hasson. Open laparoscopy techniques almost certainly decrease the risk of bowel injury distant to the umbilicus. To avoid bowel injury at the site of entry, modifications of the open technique have employed blunt entry of the peritoneal cavity with a hemostat to avoid inadvertently grasping and incising the bowel. In patients with previous laparotomy in which the scar is located at the umbilicus, use of an alternative location for trocar insertion (usually in the left upper quadrant) has been recommended to avoid injury of bowel adherent immediately beneath the umbilicus. The closest organ to the left upper quadrant is the stomach (therefore, an oral gastric tube is recommended before insertion) and the left lobe of the liver. Although clinical trials are limited, this appears to be an acceptable approach.

Despite the potential for increased risk of bowel injury after previous laparotomy, some laparoscopists advocate the use of a closed periumbilical trocar insertion techniques in all patients, regardless of a history of previous surgery. One justification is that bowel injury is uncommon (approximately 3 cases per 10,000 procedures) and open laparoscopy does not completely avoid the risk of bowel injury.

Instruments

Many surgeons says "Laparoscopy is the by product of medical engineering". Laparoscopy was initially criticized due to the cost of instruments and possible complications due to these sharp long instruments and difficult hand eye coordination. Many senior surgeon started saying "Laparoscopy is conspiracy against common man". Minimal access surgery has developed rapidly only after grand success of laparoscopic cholecystectomy. Recently computerized designing of laparoscopic instrument is introduced and microprocessor controlled safety features are added. Now it is impossible to stop the speed of growth of minimal access surgery and every day new procedures are added on its list. Laparoscopy is a technologically dependent surgery and before starting surgery every surgeon should have reasonably good

knowledge of these instruments.

Laparoscopic Trolley

The mobile video cart is equipped with locking brakes and has 4 anti-static rollers. The trolley has a drawer and three shelves, the upper shelves have a tilt adjustment and used for supporting the video monitor unit. Included on the trolley is an electrical supply terminal strip, mounted on the rear of the 2nd shelf (from the top). Recently ceiling mounted trolleys are launched by many companies which is ergonomically better and consume less space in operation theatre (Image 1).



Image 1: Laparoscopy trolley

Light cable and light source

The Minimal access surgery depends on the artificial light available in closed body cavity, and before the discovery of light source and light cable; mirrors were used to reflect the light onto the subject where the direct light access was not possible (Image 2).



Image 2: Light cable

Technique

Anterior abdominal wall is elevated. With a 11m blade, a superficial incision is made on the skin subumbilically about 1 cm. Verres needle is introduced in the direction of the coccyx taking care to penetrate all the layers of the abdomen individually & enter the peritoneal cavity, aspirate & see to get air in it. Pneumoperitoneum is created by insufflating 1-2 ltrs of CO₂ taking care to see that all quadrants of the abdomen is filling. The verres needle is withdrawn & the trocar and canula introduced in the same direction as the verres needle. This might be easy as pneumoperitoneum is already created. A light source is connected to the scope & is introduced into the peritoneum. A thorough check up of all organs is done in a methodical manner. Secondary ports can be created, operative instruments can be inserted through them. A pyramidal trocar is easier to insert than a conical one but the former does carry more risk of puncturing vessels & causing bleeding into the abdominal cavity.

It can confirm a clinical impression, establish a definite diagnosis, follow the course of a disease, and modify therapy. Certain operative procedures (tubal sterilization, ovarian cyst aspiration, or biopsy of intraperitoneal structures) can be accomplished through the laparoscopy.

Therefore, laparoscopy is an important tool to assess the reproductive pathology including tubal patency (chromotubation) in infertile women. In the same setting therapeutic interventions like adhesiolysis, PCOD drilling, cystectomy etc can be performed in these patients. Thus laparoscopy offers both diagnostic and therapeutic advantage to the infertile patients. With bulk of patients belonging to lower socioeconomic status this study offers the advantage of laparoscopy to needy infertile patients.

Aims & Objectives

A Study of laparoscopic evaluation in infertility cases at Panna Dhai Mahila Chikitsalaya, Udaipur.

Materials and Methods

Present study is a prospective study on laparoscopic evaluation of female infertility at Panna Dhai Mahila Chikitsalaya, Udaipur. This study was done for the duration of one year from Jan 2017 to Dec 2017. Our study included total 100 cases randomly selected attending OBG, OPD with both primary and secondary infertility.

Both primary and secondary infertility patients, were included in our study. After taking detailed history, thorough clinical examination, investigations and informed consent diagnostic laparoscopy was done between 7th to 11th day of menses.

Under GA, diagnostic laparoscopy was done using laparoscope. During laparoscopy uterus, fallopian tube, ovaries, pouch of douglas and peritoneal cavity were thoroughly examined and evaluated. Treatment given according to peroperative finding and other responsible factors during laparoscopy polycystic ovarian drilling in cases of PCOD, chromopertubation for tubal patency, adhesiolysis etc was done. Patient was discharged on the 2th post operative day according to her general condition and was followed on 5th post operative day for stitches removal.

Inclusion Criteria

1. All infertile patients (primary and secondary) who have under gone prior standard non invasive investigation of infertility for both Partner.
2. Those patients who were willing and gave their consent to undergo diagnostic laparoscopy for evaluation of the same.

Exclusion Criteria

1. Patients with absolute or relative contraindications for laparoscopy i.e., severe cardiopulmonary disease, presence of large abdominal masses, diaphragmatic hernia, bowel obstruction and gross obesity etc.

2. All those patient who hadn't gone prior standard non invasive investigation of infertility.
3. All those patient not willing to undergo diagnostic laparoscopy for evaluation.

Observation and Discussion

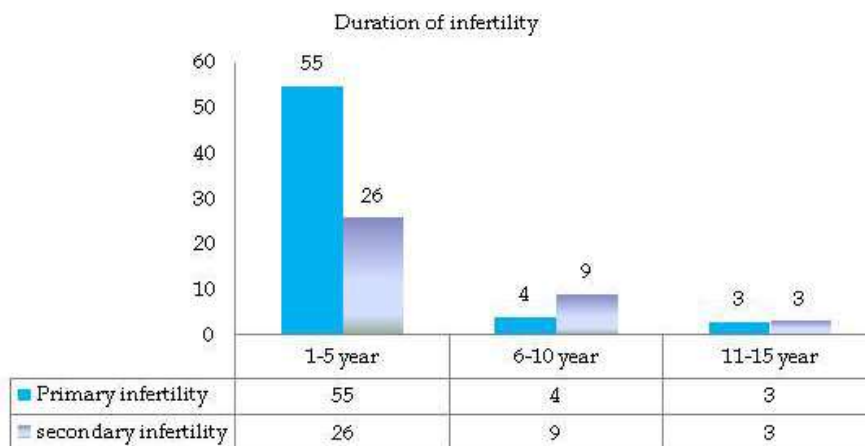
In the present study, 62 cases (62%) were primary infertility and 38 cases (38%) were of secondary infertility. This was comparable to the other earlier studies [15].

Table 1: Age wise distribution of cases

Age group (years)	Number of cases	% of cases
18-20	8	8%
21-25	43	43%
26-30	45	45%
31-35	3	3%
36-40	1	1%
>40	00	00
Total	100	

Table 1 shows the age distribution of patients. 88% of the women were aged between 20-30 yrs. 51% of the women were less than 25 yrs and 49% of the women were more than 25 yrs. The mean age of the women in the study was 26.2 yrs which is comparable to study by Waseem Talib *et al.* [18], Usmani *et al.* [17] and Amrita *et al.* [16].

Long duration of infertility in India may due to patient not seeking medical advice from rural area rituals or are going to neem-hakims. The mean duration of infertility is 3.7 yrs which is similar to the study done by Gokhan Goynumer *et al.* where the mean was 2.6 yrs among women with primary infertility (Graph 1).



Graph 1: Duration of infertility included in our cases

Table 2: Pattern of menstrual cycles

Menstrual cycles	Numbers/Percentage (N=100)
Regular	48(48%)
Irregular	52(52%)
Oligomenorrhea	28(28%)
Polymenorrhea	24(24%)

Twenty eight patients had oligomenorrhea and 24 patients had polymenorrhea and rest had regular menstrual cycles. In the present study 52% women had irregular cycles and 48% had regular cycles. However in the study by Waseem et al. 20% women had irregular cycles though 48% had polycystic ovaries detected on laparoscopy, 28% had regular cycles but had polycystic ovaries. Our study indicates growing incidence of PCOD, in our country due to life style changes. Anovulatory infertility (43%) is the most common cause of infertility (Table 2).

Table 3: Associated Symptoms in women

Symptomatic/Asymptomatic	Number (n=100)
Asymptomatic	65%
Irregular cycles	26
Dysmenorrhoea	22
Dyspareunia	27
White discharge	24
Pelvic pain/ abdomen pain	16

In present study 35% the women had symptoms like, Irregular cycles dysmenorrhoea, dyspareunia, pain abdomen/Pelvic pain related to pelvic pathology (Table 3 and Fig. 1).

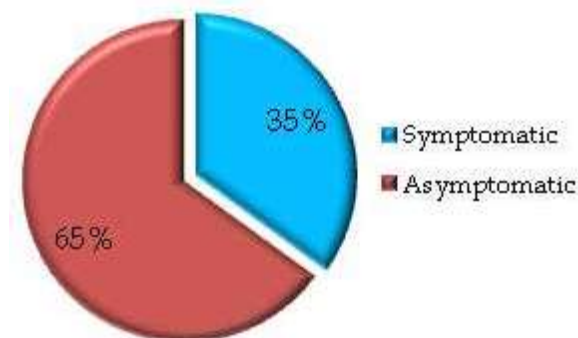


Fig. 1: Associated Symptoms

Table 4: Associated signs

Associated signs	Number of patients
BMI >25	27
Hirsutism	10
Abdominal obesity	22
Galactorrhoea	8
Significant per vaginal finding	21

In present study BMI >25 was seen in 27 cases, hirsutism was in 10 cases, abdominal obesity was seen 22 cases and galactorrhoea was in 8 cases (Table 4).

Table 5: Galactorrhoea and serum prolactin

Clinical feature	Number/Percentage (n=100)
Galactorrhoea	8 (8%)
No galactorrhoea	92 (92%)
Serum prolactin Normal	96 (96%)
Serum prolactin Raised	4 (4%)

Table 5 shows 8% women in the study had galactorrhea and 4% women had raised serum prolactin. 12% women had both galactorrhea and raised serum prolactin.

Ultrasonographic findings

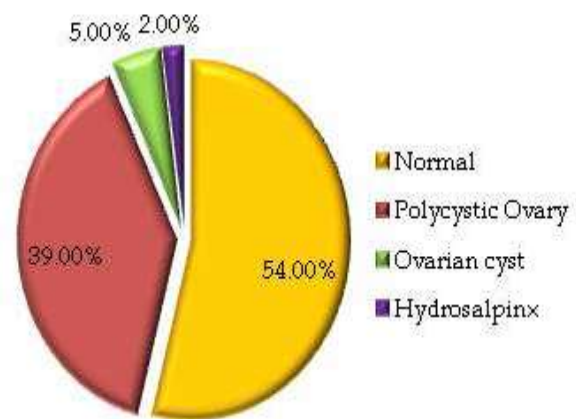


Fig. 2: Ultrasonographic findings

Pelvic ultrasonography was normal in 54 women, 39 women had polycystic ovaries diagnosed on ultrasound. 5 women had ovarian cyst, and another 2 had hydrosalpinx (Fig. 2).

Ultrasonography of the pelvis is the basic part of evaluation of the infertile women and it has replaced routine invasive investigations. In half of the patients ultrasonography was normal. Ovarian pathology including polycystic ovaries, simple cysts, adnexal masses and fibroid reported on ultrasonography were confirmed on laparoscopy. In the present study ultrasonography has detected pelvic pathology in forty nine women (Fig. 2). Where as in the study by Talat Naz [19] pelvic pathology was found in 17.65% of the women by ultrasound which was confirmed on laparoscopy.

Laparoscopy Findings

In 77% of the women reproductive pathology was noted on laparoscopy. 23% women had normal study. In 25% of the women reproductive pathology was freshly detected by laparoscopy, which was missed by other modalities like clinical examination and ultrasound.

Table 6: Uterine findings detected on laparoscopy

Finding	Primary infertility	Secondary infertility
Fibroid	3%	4%
Arcuate uterus	1%	-
Hypoplastic uterus	1%	-
Bulky	2%	-
Normal	55%	34%

In our study 7% patients had fibroid uterus in which 3% patients from primary infertility and 4% from secondary infertility. Bulky uterus seen in 2% patients of primary infertility. 84% patients had anteverted uterus and 16% patients had retroverted uterus. Among retroverted uterus most of patients were from secondary infertility (Table 6). In the present study uterine factors were found in 11% of the infertile patients. Our results were comparable with the studies conducted by Aziz N et al. [20], Amrita et al. [16], Chakraborty et al. [22] found uterine factors in 6%, 11% and 14% respectively.

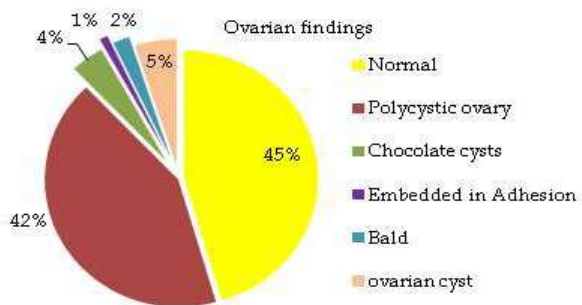


Fig. 3: Ovarian findings

55 women had ovarian pathology. 42 women had polycystic ovaries, 4 women had chocolate cyst of ovary and 6 women had ovarian cysts. Talt Naz [19] showed ovarian pathology in 13.23% of primary infertility. Among these PCO was found in 8.82% of primary infertility. In the present study ovarian pathology was seen in 55% of the women and among this 42% of the women had polycystic ovaries which is comparable to the study by Waseem Talib et al. [18] (Fig. 3). In present study anovulatory infertility is common.

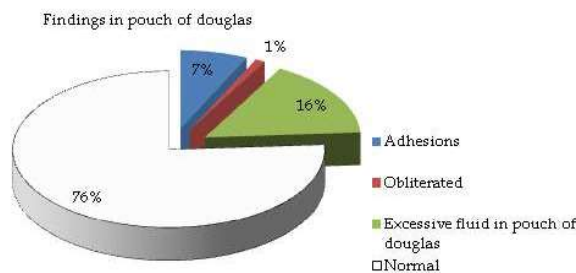


Fig. 4: Findings in pouch of douglas

In our study 7 women had adhesions in the pouch of douglas and one women had obliterated. In present study adhesion in pouch of douglas was seen in 7% patients, obliteration seen in 1% patients and excessive fluid in pouch of douglas were seen in 16% patients among them, straw colour of fluid in pouch of douglas due to tuberculosis and serous colour of fluid in pouch of douglas due to PID (Fig. 4).

Table 7: Fallopian tube findings

Finding	Number/Percentage (n =100)
Normal	67(67%)
Absent tube	1(1%)
Peritubal adhesions	6(6%)
Hydrosalpinx	4(4%)
Beaded tubes	5(5%)
Congested and inflamed tube	9(9%)
Tuberculosis	8(8%)

In present study 9 patient had inflamed tubes, 8 women had tuberculoid tube, 6 patients had peritubal adhesions, 5 patient had beaded tube and one had absent tube (Table 7).

Table 8: Chromopertubation

Blocked tubes	Number of patients
Unilateral	08
Bilateral	14
Cornual block	19
Ampullary block	03

In our study 19 women had cornual block, 14 patients had bilateral tube block and 8 patients had unilateral block. 33 women had tubal pathology diagnosed on laparoscopy. 22 women had tubal blocked diagnosed on chromopertubation. Among them 19 had cornual blocked and 3 had ampullary blocked. 4 women had hydrosalpinx. One women with bilateral hydrosalpinx turned out to have tubercular salpingitis on histopathology (Table 8).

Table 9: Fallopian tube findings

Author	Year	Bilateral tubal block (%)	Unilateral tubal block (%)
Waseem Talib <i>et al.</i> [18]	2003	24	12
Talt Naz [19]	2009	23.52	2.94
Amrita <i>et al.</i> [16]	2017	10	24
Present study	2018	14	8

Thirty three percent of the women had tubal abnormalities detected on laparoscopy which correlates with the literature that tubal factors account for 15-30% of infertility. 4 women had hydrosalpinx, 22 women had tubal blockade. Among them 14 had bilateral tubal blockade. 19 women had cornual blocks with no free flow of the dye even on repeated flushing (Table 9).

Table 10: Peritoneal finding in infertility

Peritoneal finding	Primary infertility	Secondary infertility	Total
Endometriosis	04	02	06
Tuberculosis	04	00	04
Pelvic adhesions	04	04	08
Total	12	06	18

Endometriosis was seen in 4 cases with primary infertility and 2 case with secondary infertility. Overall peritoneal factors were seen in 12 cases of primary infertility and 6 cases of secondary infertility (Table 10).

Table 11: Endometriosis

Finding	Number/Percentage (n =100)
Endometriosis Chocolate cyst	4(4%)
Endometriotic deposits	2(2%)

In our study the incidence of endometriosis was 6% which is comparable to the studies of Sharma *et al.* [21] (6.6%) and Chakraborty *et al.* [22] (4.6%).

In the study by Talat Naz *et al.* [19] the incidence of endometriosis was 10.29% in women with primary infertility. Pelvic inflammatory disease resulting in adhesions was seen in 8% of the women which is comparable with the study by Aziz N *et al.* [20] (12%). 4% of the pelvic adhesions were found to be having pelvic tuberculosis on histopathology. This is comparable to the findings of Aziz N *et al.* [20] (6%) and Chakraborty *et al.* [22] (8.3%) (Table 11).

In our study post laparoscopic complications included 4 cases of abdominal pain, two case of shoulder pain and one case wound infection (Table 12).

Table 12: Complication of Laparoscopic procedure

Complication	Number of cases	% of cases
Wound infection	1	1%
Abdominal pain	4	4%
Shoulder pain	2	2%
Total	7	7%

Table 13: Post operative complications after laparoscopy

Complication	Peterson EP <i>et al.</i> [23]	Present study
Gastric perforation	1	0.0
Wound infection	3	1
Wound hematoma	3	0.0
Failed Pneumoperitoneum	12	0.0

In our study one patient had wound infection whereas in the study by Peterson EP *et al.* [23] three patients had wound infection (Table 13).

Table 14: Therapeutic Intervention

Therapeutic intervention	Number	Pregnancy rate in Percentage
Yes (58)	13	22.41%
No (42)	7	16.66%

Twenty women conceived during the period of study. Among these 13 (22.14%) women had undergone concurrent therapeutic interventions at laparoscopy conceived during follow-up (Table 14).

Eight women conceived spontaneously, 4 women who had polycystic ovaries had undergone ovarian drilling conceived after ovulation induction. One woman conceived with GnRH agonist. 6 women conceived with ovulation induction in subsequent cycles. One woman with unilateral tubal block conceived after hydrotubation in subsequent cycles.

Summary & Conclusion

In the study laparoscopic evaluation of female infertility patients was done to know the reproductive pathology in primary and secondary infertility and to formulate the line of management in such patients. Laparoscopy detects pelvic pathology to a significant level even in women thought to be at low risk and enables formulating the line of management for infertile women.

Most effective treatment decisions and interventions can be made in the light of laparoscopic findings in managing infertility. Though laparoscopy is invasive the complications associated with the procedure can be minimized

with proper training.

Laparoscopy is a valuable technique for the complete assessment of female infertility, especially in symptomatic patients and should be used early in the diagnostic work up. With bulk of our patients belonging to low socio-economic status laparoscopic evaluation of infertile women offers therapeutic advantage to the needy infertile couple.

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