



LAPAROSCOPIC FINDINGS IN INFERTILITY

Obstetrics & Gynaecology

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ABSTRACT

Introduction: The success of womanhood culminates to its zenith in motherhood. Even today Indian society, predominantly feudalistic in nature, attaches tremendous importance to motherhood. Instances are ample where women have been compared to land and fertility have been considered to be an intrinsic quality shared by both these "assets" which men own. The media flashes women of today delivering an exuberant smile and claiming that their ultimate success has been attained when they have become mothers. **Aims:** Visualization of anatomy of uterus, fallopian tubes and ovaries and Detection of pelvic tuberculosis, a disease still very much prevalent in our country. **Materials and Methods:** The present study was prospective study. This Study was conducted from August 2021 to July 2022 at SKIMS Medical College and Hospital. **Result:** Chromotubation findings showed tubal block (unilateral and bilateral) in 24 cases (45.29%) and healthy patent tubes in 29 cases (54.71%). In a number of cases coexistence of adhesion, endometriosis and tubal pathology has been noted. **Conclusion:** As laparoscopy is an invasive procedure and requires general anaesthesia, it is not free of complications, but if done by a skilled person in a proper set-up the complications are minimum.

KEYWORDS

Laparoscopy, Endometriosis, Infertility and Primary infertility.

INTRODUCTION

The success of womanhood culminates to its zenith in motherhood. Even today Indian society, predominantly feudalistic in nature, attaches tremendous importance to motherhood. Instances are ample where women have been compared to land and fertility have been considered to be an intrinsic quality shared by both these "assets" which men own. The media flashes women of today delivering an exuberant smile and claiming that their ultimate success has been attained when they have become mothers. In this context, infertility is definitely a problem which affects many ill-fated couples throughout the world. The infertile couple remains psychologically disturbed in their day to day life, right from the beginning, more so as the investigation progresses. The focus of the clinician therefore, should not only be on the diagnosis of the cause and treat the same, but also to counsel them in order to minimize the psychological upset.

Infertility has been defined as one year of unprotected intercourse without pregnancy. This condition may be further classified as primary and secondary. In primary infertility no previous pregnancies have occurred, whereas in secondary infertility a prior pregnancy, although not necessarily a live birth, has occurred. Infertility affects approximately 10 to 15% of couples worldwide and is an important part of clinical practice for many gynaecologists.

Fecundability is the probability of achieving pregnancy within a single menstrual cycle. The fecundability of a normal couple has been estimated at 20 to 25%. On the basis of this estimate about 80% of couples should conceive after 12 months of unprotected intercourse. Guttmacher's classic table has been a standard since 1956. According to the table, after 3 months of unprotected coitus pregnancy rate is 57%, after 6 months 72%, after 1 year 85% and after 2 years 93%.

Conception depends on the fertility potential of both male and female partners. Therefore, from the beginning, the evaluation of infertility focuses on the couple and not on one or the other partner, regardless of past reproductive performance. The male is found to be absolutely responsible for infertility in some 30% cases and partially responsible in 50% cases, the female in about 40 to 50% and both are responsible in about 10% cases. The remaining 10% comes under unexplained group where no definite cause could be found out even after thorough investigations.

Investigation of infertility is usually started if a couple fails to achieve pregnancy after one year of unprotected intercourse. But investigative procedures may be started earlier if the woman is elderly (above 35 years of age) and the couple is very much anxious to have a child. The probability of achieving a live birth without treatment decreases with increasing age and duration of infertility. Overall, the likelihood of

success without treatment declines by about 5% each additional year of female partner's age and by 15 to 25% for each added year of infertility. The examination of infertile couple starts with male counterpart with husband's semen analysis. When the male factor of infertility is excluded the female partner is examined. Proper history, including menstrual history are all noted. From the regularity of the cycle a lady can be presumed to have an ovulatory cycle which has to be confirmed by some tests. The traditional tests of ovulation such as temperature charts, endometrial biopsy have now been superseded by the use of luteal phase progesterone estimation and ultrasound follicular scanning. When the woman has been shown to be ovulating the next step is to establish the functional behaviour and anatomical patency of the fallopian tubes. The principal techniques employed for this are hysterosalpingography and laparoscopy with chromopertubation of the tubes.

Laparoscopy enables to directly visualize the fallopian tubes, whether they are normal or diseased. The tubal patency can be assessed by doing chromopertubation with methylene blue dye along with laparoscopy. Not only tubal assessment, peritoneal factors like adhesions or presence of endometriosis can be detected. Evaluation of uterus for size, shape, position, whether containing any fibroid, presence of endometriosis or of congenital anomalies if any, can also be detected. Adequate visualization of both ovaries during laparoscopy with regard to their size, presence of signs of ovulation, adhesions or tumors if any, can also be detected.

AIMS AND OBJECTIVES

The use of laparoscopy is gradually widening both in diagnostic and therapeutic field in gynaecology. Laparoscopy has revolutionized the assessment of infertile couples. The present study aims at assessment of female factors of infertility by laparoscopy.

Aims

1. Visualization of anatomy of uterus, fallopian tubes and ovaries.
2. Detection of endometriosis and its severity and pelvic organ adhesions.
3. Detection of pelvic tuberculosis, a disease still very much prevalent in our country.
4. To diagnose pathological conditions of ovary like polycystic ovary (PCO) where ovarian morphology is one of the diagnostic criteria.
5. To assess tubal patency with the help of dye test.

MATERIALS AND METHODS

This prospective study has been done at SKIMS Medical College and Hospital from August 2021 to July 2022. For the purpose of the study,

patients presenting with either primary or secondary infertility attending Gynaecology outpatient department of SKIMS Medical College and Hospital were taken.

Inclusion Criteria

1. Husband's semen analysis- within normal limit
2. Couple trying for pregnancy for one year or more (atleast 3 to 6 months if female partner's age is more than 35 years).
3. Wife's hormonal profile (viz. thyroid function test, Prolactin, FSH and LH) – normal.
4. Ultrasonography pelvis- no gross lesion present.
5. No definite contraindication for laparoscopy.

The basic semen analysis measures semen volume, sperm concentration, sperm motility, and sperm morphology. Normal values suggested by the World Health Organisation (WHO) are as follows :

Volume: > 2.0 ml

Sperm concentration: > 20 million/ml

Motility: > 50%

Morphology: > 30% normal forms

In addition, many laboratories measure pH, fructose levels, and white blood cell counts within the semen.

After proper selection of cases, a detailed history followed by general, systemic and pelvic examination of the female partner was done and noted as per the following protocol.

RESULT AND DISCUSSION

Laparoscopy as a diagnostic tool has made the investigation for infertility easier and more informative than any other method alone. In this study an attempt has been made to assess infertile women by laparoscopy and chromotubation and study the various factors contributing to infertility.

The study included 53 patients who attended the Gynaecology Outpatient Department of SKIMS Medical College and Hospital with complain of infertility, both primary and secondary.

Incidence of infertility

In our study 1750 patients attending Gynaecology Outpatient Department during the 1 year study, infertility was detected in 136 patients (7.77%). However only 53 patients had undergone laparoscopy and chromotubation with endometrial biopsy. This is because of the various inclusion criteria which needed to be fulfilled prior to laparoscopy. Moreover some of the patients were not willing for surgical intervention to find out the cause of infertility, some of them had poor compliance and few of them had conceived during their infertility workup. Worldwide infertility is affecting 8-12% of couples (BJOG September 2005)

Incidence of primary and secondary infertility

In our study, 53 patients, 34 patients (64.15%) reported with primary infertility and 19 patients (35.85%) had secondary infertility. Chitra Kumari et al (2000)¹ reported the incidence of primary infertility as 76.28% and secondary infertility as 23.72% in their study. According to Nalbanski (1990) primary infertility noted in 64% and secondary infertility in 36% cases. In all patients in this series, husband's semen analysis was within normal limits. With advancement of civilization the late age marriage and delay in child bearing are the contributing factors to this increased incidence of primary infertility with time. At the same time the smaller number of secondary infertility could be explained by small family norms adopted by many couples and also there is a greater chance of further pregnancy once the woman conceives.

Duration of infertility

Women failing to achieve pregnancy more than one year of unprotected intercourse are evaluated in the present study. It was been observed that the maximum number of patients have infertility of 2 to 5 years duration. Most couples usually waited 1 to 2 years before consulting doctors for their infertility problems.

According to Agarwal S.N. (1977)² studies indicate that 10 to 25 percent of all births occur within 1 to 5 years of married life. 50 to 55% of all births within 5 to 15 years of married life. Births after 25 years of married life are very rare.

Socioeconomic class and infertility

Our study showed that patients belonging to middle income group comprised 75.47% of the total cases of infertility. Classification of socioeconomic class was arbitrary depending on the family income and number of dependant family members. Here maximum patients attending Gynaecology Outpatient department were from middle income group. As a result they constituted the main bulk of infertile patients, whereas high and low income groups together constituted 24.53%.

Menstrual patterns and various symptoms associated with infertility

Many menstrual abnormalities have been found to be associated with infertile patients. Menorrhagia is present in 9 cases (16.98%) whereas oligomenorrhoea and hypomenorrhoea together constitute 18 cases (33.96%). The symptoms associated with infertility are dysmenorrhoea 10 cases (18.87%), dyspareunia 5 cases (9.43%), leucorrhoea 4 cases (7.55%) and symptoms of tuberculosis 3 cases (5.66%). There has been considerable overlapping of symptoms.

Menstrual patterns and their association with PCO

We observed that menstrual patterns associated with PCO. Here a menstrual abnormality in the form of oligomenorrhoea and hypomenorrhoea was noted in 66.67% cases. PCOS is a many faceted heterogenous problem and the commonest hormonal disturbance to affect women. The highest reported prevalence of PCO has been 52% amongst South Asian immigrants in Britain, of whom 49.1% had menstrual irregularity. From Table no. 11, the incidence of PCO is 11.32% whereas in general the prevalence is 15 to 20%. At the joint ASRM/ESHRE consensus meeting in 2003 PCOS has been redefined which requires the presence of two out of the following three criteria : (i) oligo – and/or anovulation; (ii) hyperandrogenism (clinical and/or biochemical); and (iii) polycystic ovaries, with exclusion of other aetiologies. Polycystic ovaries however, can exist without clinical signs of the syndrome, which may then become expressed over time.

Past history and infertility

Previous medical and surgical history contributing to infertility was found in 8 cases of primary infertility (23.53%) and 6 cases of secondary infertility (31.58%). History of operation or illness gives an idea regarding the cause of infertility and it has been seen that tubal pathology was present in all these cases.

Obstetric history and secondary infertility

In patients with secondary infertility, previous obstetric history needs to be evaluated and it has got definite importance regarding identification of the cause of infertility. In the present study 19 out of 53 patients were suffering from secondary infertility. Out of them 9 cases (47.37%) had history of abortion (both spontaneous and induced), one had a history of ectopic pregnancy (5.26%), history of confinement was noted in 11 cases in the form of vaginal delivery, caesarean section and still birth. Out of these 11 cases, 10 cases (90.91%) had normal puerperium whereas history of puerperal sepsis was noted in 1 case (9.09%). From Table no. 10, out of the 9 cases of abortion, associated tubal pathology was detected in 8 cases (88.89%)

Laparoscopic findings

In the present series out of the 53 infertile patients subjected to laparoscopy and chromotubation 3 cases revealed no apparent pelvic pathology, normal dye test and secretory endometrium. On the basis of laparoscopy findings, adhesions (18.87%) and endometriosis (28.30%) were noted in 47.17% of the cases of infertility. Apart from tubal block, the other pathologies related to fallopian tubes like peritubal adhesions, fimbrial cyst and hydrosalpinx were noted in a total number of 7 cases (13.21%).

Incidence of endometriosis

Endometriosis associated infertility is not a condition of sterility but more popularly subfertility. From Table no. 11 incidence of endometriosis was found to be 28.3%. Many cases of moderate endometriosis are asymptomatic and have no obvious clinical findings. In such patients laparoscopy is the only way for diagnosis. Strathy et al (1982)³ reported endometriosis in 2% of fertile women in USA compared with 21% among infertile group. The prevalence of endometriosis in female partner of infertile couple undergoing laparoscopy varies between 20 and 50%.

Certainly the overall prevalence of endometriosis appears greater in infertile than in fertile women. Infertile women are also more likely

than fertile women to have moderate to severe disease.

Incidence of PCO

Another finding noted by laparoscopy is PCO. Incidence of PCO is 11.32%. Mehra Mehra Tyagi found PCO in 4.5% cases whereas Hamid (1994) found in 7% of the cases of infertility. In general the prevalence of PCO is 15 to 20%.

Findings of chromotubation

It was found that chromotubation findings showed tubal block (unilateral and bilateral) in 24 cases (45.29%) and healthy patent tubes in 29 cases (54.71%). In a number of cases coexistence of adhesion, endometriosis and tubal pathology has been noted. These observations illustrate that the prevalence of tuboperitoneal factors affecting infertility are high in our community.

Types of tubal block in infertility

In this study distal tubal occlusion was noted in 41.67% and proximal occlusion in 58.33% cases. Maathuis (1972)⁴ found higher percentage of interstitial block. Commonest site of tubal occlusion is at the fimbrial end. Most cases of distal tubal occlusion are due to ascending genital tract infection. The incidence of ascending genital tract infection is affected by parity, sexual habits, social and cultural factors. Nalbanski B. et al. (1990)⁵ did diagnostic laparoscopy in 200 patients. The mean age of the patients was 29 years and 128 women suffered from primary and 72 from secondary infertility.

Caspi et al (1979)⁶ reported an inverse relationship between grade of periannexal adhesion and pregnancy rate in a study in which 101 patients were undergoing reconstructive tubal operation for infertility. Punnonen (1983)⁷ performed diagnostic laparoscopy during 1971 to 1980. Peritubal adhesion was detected in 13.9%. In the present series from Table no. 11 peritubal adhesion was noted in 9.43% cases.

No serious complications were encountered in the patients included in the present study. Due to pneumoperitoneum mild chest pain, abdominal pain occurred in a few cases. Extraperitoneal insufflation occurred in 2 cases where reinsertion of the Veress needle was done at a separate site. These 2 cases developed subcutaneous emphysema and they were kept under close observation and treated conservatively for 48 hours till they became stable.

Using the criteria of Noyes et al (1950)⁸, the luteal phase endometrium can be dated histologically.

One of the pioneering examples of detailed surgical audit was confidential enquiry into gynaecological laparoscopy conducted on behalf of the RCOG by Professor G.V.P Chamberlain which revealed an overall complication rate of 34/1000 and a mortality rate of 0.08/1000. Even two decades later diagnostic laparoscopy is associated with approximately 3% risk of minor complications such as nausea and shoulder tip pain. The risk of major complications such as bowel injury and injury to major blood vessels is about 0.6 -2/1000.

CONCLUSION

1. Age of female patients and duration of infertility are important parameters for evaluation of infertility.
2. While history and clinical examination should not be underestimated in their ability to provide the likely diagnosis, it should always be completed with laparoscopic evaluation.
3. By laparoscopy uterus, tubes, ovaries as well as peritoneal cavity are directly visualized and complete information can be obtained about concurrent pelvic pathology. Only intrauterine pathology like submucous polyp or synechiae cannot be detected by laparoscopic technique. Hence now a days in many infertility centres combination of hysteroscopy and laparoscopy is done for complete evaluation of infertile women.
4. Laparoscopic chromotubation and endometrial biopsy can be done concurrently to test tubal patency and detect the various endometrial patterns.
5. As laparoscopy is an invasive procedure and requires general anaesthesia, it is not free of complications, but if done by a skilled person in a proper set-up the complications are minimum. Introduction of methylene blue during laparoscopic chromotubation can also produce chemical peritonitis but this is transient and settles as the dye disperses.

The cost and associated surgical morbidity have traditionally been

justified because laparoscopy, unlike hysterosalpingography, allows pelvic diseases such as endometriosis and adhesions to be detected besides enabling the assessment of fallopian tube patency.

Table: Past obstetric history in secondary infertility and associated tubal pathology (total=19)

Obstetric history	No. of cases (%)	Associated tubal pathology No. of cases (%)
History of abortion (spontaneous and induced)	9 (47.37%)	8 (88.89%)
H/o ectopic	1 (5.26%)	1 (100%)
Vaginal delivery	8 (42.11%)	4 (50%)
Caesarean section	2 (10.53%)	1 (50%)
Stillborn	1 (5.26%)	1 (100%)

Table: Findings of further evaluation of patients with no apparent pelvic pathology on laparoscopy

Investigation	Dye test	Endometrial biopsy	No. of cases (total =9)	Percentage
Laparoscopy				
No apparent pelvic pathology	Tubes patent	Secretory endometrium	3	33.33
No apparent pelvic pathology	Tubal block	Secretory endometrium	4	44.45
No apparent pelvic pathology	Tubes patent	Proliferative endometrium	2	22.22

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