

Laparoscopic evaluation of tubo-peritoneal causes of infertility

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Abstract

Tubal and peritoneal factors are related to female infertility by about 25-30%. Through laparoscopy we want to know what are the tubal and peritoneal leading causes and its management related to primary & secondary infertility. Twelve hundred women were selected for laparoscopic evaluation from January 2001 to December 2012 (diagnostic as well as disease correction) those who have no other ovarian, uterine or extra uterine pathology and male factor abnormalities. Under spinal or general anaesthesia, abdomen was distended by CO₂, 10mm telescope was introduced by sub-umbilical port and another two ports are used for accessories. Before that history taking, general & per vaginal examination, associated relevant investigations were done for exclusion of other causes. Twelve hundred laparoscopy had been done only for detection of tubo-peritoneal causes of infertility. Sixtyseven percent was primary infertility and 33% was secondary infertility. Normal healthy tubes were found in 52% and among the unhealthy tubes, majority were peritubal adhesion (15.8%) followed by unilateral cornual block (12.9%). Treatment given to the patients were adhesiolysis, unilateral or bilateral salpingectomy, salpingostomy and fimbrial dilatation. Hysteroscopic canulation were done in 7 cases. Advice were given for in vitro fertilization & embryo transfer to 71 patients. Pregnancy rate after laparoscopic management was 43% and rest was under observation. Tubal block are more common than in peritubal adhesion. About 50% patient has a history of some form of genital tract infection. Laparoscopy and same sitting hysteroscopic canulation are essential for better pregnancy outcome in patient of proximal tubal block.

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Introduction

Fallopian tube obstruction is a major cause of female infertility. Blocked fallopian tubes are unable to let the ovum and the sperm converge, thus making fertilization impossible. About 20 % of female infertility can be attributed to tubal causes.¹ Tubo-peritoneal factor of infertility includes blocked fallopian tube, partially blocked fallopian tube, one of the two tubes blocked, tubal scarring and other types of damage of the fallopian tubes and due to any anatomical defect or any history of pelvic inflammatory disease (PID), tubal surgery, ruptured appendix, ovarian surgery or septic abortion strongly suggest the possibility of tubal disease. Tubal infertility is most often caused by Chlamydia and Nisseria Gonorrhoea, it leads to pelvi-peritoneal adhesion, constitute the single most common cause of tubal pathology responsible for tubal infertility.² Proximal tubal occlusion prevents sperm transfer to the distal

portion of fallopian tube where fertilization normally occurs. Distal tubal occlusion or adhesion prevents egg pick up. Distal tubal disease can range from mild (fimbrial adhesion) to severe (complete occlusion).

The diagnostic evaluation of tubal patency in infertile women can be accomplished by performing laparoscopy, hysterosalpingogram (HSG) or a saline sonogram.^{3,4} Every procedure has some advantages or disadvantages. But laparoscopy allows for the most comprehensive evaluation of tubal and peritubal factors, proper evaluation and management which can improve the fertility. However, Bangladesh has no population based data regarding tubo-peritoneal factors related to infertility. Our aim is to evaluate the tubo-peritoneal factors that are related to primary or secondary infertility in our country with the management and future planning for improving the fertility.

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Methodology

Material & Methods: Around 1200 women were selected for laparoscopic evaluation (i.e. diagnostic as well as disease correction) those who have no other ovarian, uterine or extrauterine pathology starting from January 2001 to December 2012 in Khulna Medical College Hospital and private clinic.

Selection Criteria: 1. Primary & secondary infertility. 2. No endometriosis. 3. Confirm ovulation by transvaginal ultrasonography for folliculometry / use of LH kits. 4. Previous history of menstrual regulation, D & C, hysterosalpingography (HSG) and any pelvic surgery. 5. Completed treatment of tuberculosis. 6. Past history of ectopic pregnancy operation. **Exclusion criteria:** 1. Age > 42 years. 2. Male factor i.e severe oligospermia / Nacrospermia 3. Increased FSH & LH (Premature ovarian failure). 4. Other causes related to infertility (i.e. Detected endometriosis, multiple fibroid). **Procedure:** Under spinal or general anaesthesia, abdomen was distended by CO₂, 10mm telescope was introduced by sub-umbilical port and another two ports are used for accessories. Before that history taking, general & per vaginal examination associated relevant investigations were done for exclusion of other causes.

The laparoscopic evaluation was performed in the follicular phase of menstrual cycle. After making a neumoperitonium, a thorough inspection of pelvis, internal genitalia and liver region were performed, followed by testing of fallopian tube patency by using methylene blue, a dilute solution of methylene blue was injected through cervix via a Robin canula. The presence of adhesion, structural abnormalities of the uterus, endometriosis & fallopian tube occlusion were sought for. Tubal occlusions detected by laparoscopy were classified as no tubal occlusion, one sided tubal occlusion or both sided tubal occlusion. During laparoscopy, therapeutic reproductive surgery such as adhesiolysis, salpingectomy, salpigostomy, coagulation of grade I or II endometriosis, or cystectomy were performed when required and in proximal tubal block, hysteroscopic canulation had been done selectively. During hysteroscopic canulation uterine cavity was distended by normal saline, Glycin or Sorbital and cervix was dilated about 7-10 mm for using telescope with operative sheeth. Under hysteroscopic guidance any proximal tubal obstruction (due to mucous plug or spasm) can be released. A special flexible catheter was passed through the tubal ostium up to the interstitial part of the tube under guidance of laparoscopy.

Result

We had done 1200 laparoscopy for detection of tubal and peritubal causes of infertility, within that 67% (804) were primary infertility and 33% (396) was secondary infertility (Fig-1).

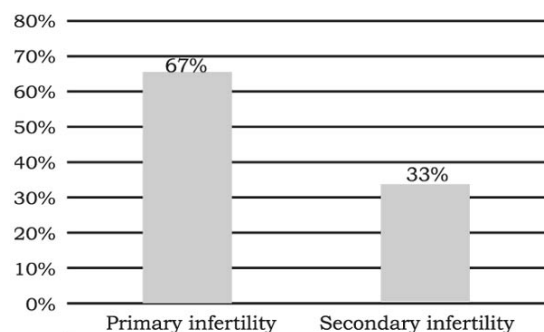


Figure-1: Number of infertility patients

The present study showed maximum duration of infertility was within 1-6 yrs, after marriage was concerned, 3% patients sought medical advice within 16-20 years. 30% patient sought for medical advice within ages 21-25 years, 26-30 years was 40%, 31-35 years was 20%, 35-40 years was 06% and above 40 years about 1% (Fig-2).

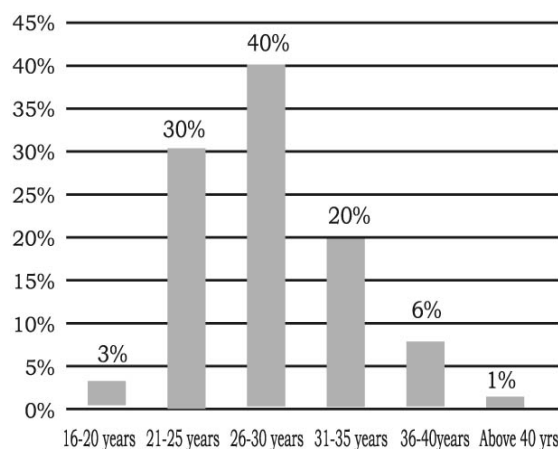


Figure-2: Distribution of cases according to duration of infertility

After laparoscopic evaluation we got normal healthy tube without any tubal pathology about 52% (624), peritubal adhesion about 15,7% (189), unilateral cornual block 13% (155), Bilateral cornual block 5.5% (66), Uni-lateral & bi-lateral fimbrial block was 06% (73), Hydrosalpinx 2.3% (28), Pyosalpinx 2.3% (28), Congenital tubal defect and hypoplasia 3% (37) which was shown in table I.

Within our study population, 45% patient has no relevant history those were directly or indirectly related to infertility.

Table I
Laparoscopic findings

Findings	No of causes	%
Normal findings	624	52
Peritubal adhesion	189	15.75
Tubal block	221	18.4
Unilateral-155		
Bilateral- 66		
Fimbrial block	129	10.6
Unilateral and bilateral agglutination-73		
Hydrosalpinx -28		
Pyosalpinx -28		
Congenital tubal defect	16	1.3
Short tube - 7		
Unusual lengthy tube-9		
Hypoplastic uterus & tube	21	1.75

18.8% patient has a history of M.R, 10.75% has D&C, 3.5% has HSG, 13% has pelvic surgery, H/O PID -3.75% and 0.25% has T.B which was shown in table II.

Table II
Etiological factor related to the tubal pathological changes

Findings	No of causes	%
No relevant history	540	45
Menstrual regulation (MR)	266	18.8
D&C	130	10.75
for infertility	69	
abortion complication	61	
H/o of Hysterosalpingography (HSG)	51	3.25
H/o of previous pelvic surgery	213	13
Appendectomy	77	
Chocolate cyst operation	27	
Ovarian cyst operation	34	
Myomectomy	09	
Caesarean section	18	
Pelvic tuberculosis	3	0.25
Pelvic inflammatory disease(PID)	45	3.75

The treatment that was given to the patient was presented in table III. No treatment was required in 55% patient due to normal pelvic anatomy and congenital uterine with or without tubal or only tubal anomalies. 16.75% patient required mild to severe adhesiolysis. Unilateral / bilateral

salpingectomy had been done in 6% cases due to pyosalpinx, & hydrosalpinx. These patients had a history of D&C, M.R, previous pelvic surgery and HSG. No treatment was given to the unilateral tubal block. In bilateral proximal tubal block, 19 cases were attempted for hysteroscopic canulation, rest were not attempted due to tubal tortuosity. But in 7 cases hysteroscopic canulation was done successfully. 5% patient had been referred to the IVF and ET centre, these are failed tubal canulation and bilateral salpingectomy, frozen pelvis and tubal anomalies. Pregnancy rate after laparoscopic management was 43%, rest of the patient has under observation.

Table III
Treatment given to the patient

Treatment	No	%
Adhesiolysis	201	16.75
Salpingostomy	26	2.1
Unilateral / bilateral salpingectomy	72	6.0
Fimbrial dilation	26	2.1
Bilateral proximal block	66	5.5
Hysteroscopic canulation successfully done	7	
Failed canulation	19	
Not done	40	
Laparotomy followed by Laparoscopy for frozenpelvis.	13	1.08
No tubal pathology but stage 1 or Stage pelvic endometrisis- adhesiolysis, small cyst ablation	194	16.16
No treatment:	661	55
Normal pelvic organs	624	
Only tubal anomaly	16	
Hypoplasia of uterus & tube	21	

Discussion

The anatomic and physiological tubal function of ovum pick up, fertilization and zygote transport between the ovary and tube is the normal process of procreation.^{3,4} Tubo-peritoneal factors accounts for up to 25-30% of infertility with varied and desired etiologies, pelvic peritoneal adhesion mostly sequels of prior infections from STD by chlamydia trachomatis and N. gonorrhoea and post MR, abortion & delivery related to pelvic inflammatory disease (PID).^{5,6} PID may be responsible for more than 50% of the causes of tubal factor infertility. PID can damage the tube at multiple sites. Proximal (uterotubal) obstruction occurs in 10-25% of women with tubal disease.⁷ However, population based data from Bangladesh are lacking. Proximal tubal obstruction secondary to tubal spasm or intratubal debris may be a

reversible condition. Tubal factor for infertility was common in developing countries due to high incidence of PID with limited resources but the prevalence appears to be higher in India due to higher rates of unrecognized pelvic inflammatory disease (PID) and tuberculosis but no such study in our country.⁸ Less severe disease may cause distal tubal stenodilatation, fimbrial adhesion, tubal kinking and fixity from adhesions with preserved tubal patency. Tuberculous involvement of the tube can be mild with damage to the tubal lining or more severe, with tubal scarring, rigidity, fibrosis, stenocclusion, dilatation, hydrosalpinx, peritubal and pelvic adhesion. Other important causes of tubal damage include endometriosis (7-14%), salpingitis isthmica nodosa and cornual polypoidal lesions (10%).⁹

In our study the mean age of women in primary infertility was 27 years and secondary infertility was 29.6 years. Maximum number of patient seeks for medical advice within 21-30 years (about 70%) with less than 5 years infertility. Tubal adhesion & tubal cornual block were the most common causes of infertility i.e in our study tubal adhesion was 15.75% and tubal block in variable site is about 29%. 22%, 10.75% patient has a history of MR, & D & C for infertility or abortion complications and 12.5% patient has a history of pelvic surgery. Pelvic surgery were appendectomy, ovarian cyst operation, myomectomy and caesarean section, Within that 62% patient had adhesion in the form of flimsy adhesion of one/both tubes, uterus adherent with anterior abdominal wall with lateral tubal adhesion, hydrosalpinx and pyosalpinx.

HCG in unsterile condition may itself cause tubal adhesion and block. Majority of diagnostic center in our country does not maintain the proper sterilization and this procedure is done by unexpert person may have chance to introduction of infection which lead to PID and tubal block. It should be considered before doing HSG, maintain proper sterile condition and in suspected cases cervical culture for Gonococcus and Chlamydia should be performed prior to HSG and prophylactic antibiotic treatment; utilizing doxycyclin 100 mg twice daily for 3-5 days is a good idea especially when tubal disease is suspected.¹⁰ Beside this injection of the contrast media may cause tubal spasm in the cornual region that may be misinterpreted as proximal tubal occlusion.¹¹ Majority causes have been treated by adhesiolysis, salpingectomy or salpingostomy. In proximal tubal disease we treated successfully by hysteroscope canulation in 7 cases, failed canulation in 19 and not done in

40 cases due to laparoscopic detection of tubal tortousity but in case of hydrosalpinges we removed both tubes for overcoming the adverse impact of IVF pregnancy outcomes.

Comprehensive meta analysis have been concluded that IVF success rates in women with hydrosalpinges are significantly reduced. Several theories have been proposed to explain the adverse effects of the hydrosalpinges on IVF pregnancy outcome, including mechanical interference of the tubal fluid with implantation as well as possible toxic effects on the endometrium.^{12,13}

About 55% patient did not require any treatment within that normal pelvic organ was 52% and congenital tubal anomalies and hypoplasia of uterus and fallopian tube about 03%. 71 patients had been advised for in vitro fertilization with embryo transfer procedure and rest under treatment. Pregnancy rate after laparoscopic management was 43%.

Conclusion

Higher evidence of tubal pathologies were related to unsafe abortion, M.R, mismanaged home delivery, previous pelvic surgery. Tubal blocks are more common than in peritubal adhesion. So laparoscopy and same sitting hysteroscopic canulation are essential for better pregnancy outcome in patient of tubal block.

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