

ORIGINAL ARTICLE

Laparoscopic Evaluation of Tubal Factors in Female Subfertility

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ABSTRACT

Objective: The objective of this study was to evaluate frequency of tubal factors as a cause of female subfertility using laparoscopy.**Study design:** It was a cross-sectional study**Setting:** This study was conducted at Obstetrics and Gynecology department, Arif Memorial Teaching Hospital Lahore / Rashid Latif Medical College**Duration of study:** Study was done in 6 months [June 4, 2022 till December 4, 2022]**Methodology:** Using non probability consecutive sampling 179 females with primary and secondary subfertility who fulfilled the inclusion and exclusion criteria were enrolled in the study. Detailed demographics were recorded after taking informed written consent.**Results:** The mean age of participants was 29.12 ± 4.04 years with minimum and maximum age between 19 and 42 years. The mean duration of marriage was 7.13 ± 3.66 years with minimum and maximum duration of marriage between 3 and 17 years. The mean duration of subfertility was 5.32 ± 3.26 years with minimum and maximum duration of subfertility between 2 and 18 years. There were 137(76.5%) of the cases who had primary and 42(23.5%) females had secondary subfertility. A total of 56(31.2%) females had tubal factors and 123(68.7%) females did not have tubal factors as cause of subfertility. There were 39(21.8%) females who had Peri tubal adhesion, 17(9.5%) females had tubo ovarian mass. Among the 56 participants who had tubal factor presents 40 (22.3%) had bilateral blocked tubes**Conclusion:** Through the findings of this study, we concluded that 31.2% females had tubal factors subfertility, including 21.8% females with peri tubal adhesion and 9.5% females with tubo ovarian mass. 22.3% of the participants had bilateral blocked tubes. Hence proper evaluation of the female partner in a subfertile couple should be done by laparoscopy which is a superior tool for diagnosing tubal factors responsible for subfertility and tubal patency should also be confirmed before prescribing treatment such as ovulation induction.**Keywords:** Infertility, diagnostic laparoscopy, tubal factors, peri tubal adhesion, tubo ovarian mass, blocked tubes

INTRODUCTION

Subfertility affects a couple's social, psychological, financial, and sexual lives and is a major health issue worldwide.¹ Subfertility is commonly defined as the inability to conceive after 12 months to 24 months of unprotected sexual intercourse. Both primary (when a couple has tried and failed to conceive) and secondary (after a pregnancy) subfertility exist.² Worldwide, subfertility affects between 10 and 15 percent of couples. Subfertility can be attributed to a female factor in 35% of instances, a male factor in 45% of cases, a mix of variables in 10% of cases, or an unknown cause in the remaining 5% of cases.^{3,4}

Factors such as anovulatory dysfunction, tubal factors, polycystic ovary syndrome, peri-tubovarian adhesions, endometriosis, uterine and cervical factors, and so on account for the vast majority of cases of female infertility.^{5,6,7} Hysterosalpingography was previously used to evaluate the uterine cavity, tubal structure, and tubal patency but has since been mainly replaced by laparoscopy and hysteroscopy. Advances in endoscopic surgery have altered the method for gynaecologists to diagnose and manage patients with subfertility.⁸ Laparoscopy provides a panoramic picture of the anatomy of pelvis and amplifies the image of pelvic organs. Laparoscopy is the standard means of detecting the tubal pathology, peritoneal factors, endometriosis and intraabdominal causes of subfertility. This aids in deciding how to treat subfertility and can reveal previously undetected pelvic disease.^{6,8}

The rationale of this study was to explore Tubal factors responsible for subfertility based on laparoscopy. In our country patients are routinely prescribed ovulation induction without assessment of tubal patency. As ours is a developing country according to literature, most common cause of tubal blockage are pelvic adhesions secondary to pelvic infections, pelvic tuberculosis & puerperal infections. By larger sample size (n=179) this study helped us to understand the role of tubal factors responsible for female subfertility using laparoscopy that is an emerging and

valuable technique for complete assessment of female subfertility thus leading to prescribing treatment accordingly.

The objective of this study was to determine the frequency of various tubal factors as a cause of female factor subfertility, using laparoscopy.

Operational Definition: Infertility: All the women who failed to conceive after 12 months of regular intercourse, were further divided into primary subfertility which is defined as 'if a couple has never been able to conceive' and as secondary subfertility 'when a couple has never been able to conceive following a pregnancy'.

Tubal factor on Laparoscopy: It was defined when no spill of dye was seen from the fimbrial ends on both side with presence of peritubal adhesions and tubo ovarian mass.

MATERIALS AND METHODS

This was a cross-sectional study using non-probability consecutive sampling. It was conducted at Obstetrics and Gynecology department Arif Memorial Teaching Hospital, Rashid Latif Medical Complex, Lahore and Hameed Latif Hospital in 6 months from June 4, 2022 till December 4, 2022. A total of 179 females were enrolled using percentage of tubal factor as cause of subfertility as 44.1%. We used 95% confidence level and 8% margin of error. All the women aged 18-44 years with subfertility (as per operational definition) were included. Women who were not living with their husband for at least 12 months, couples suffering from male factor subfertility and patients with absolute or relative contraindication for laparoscopy i.e. any pre-existing cardiovascular or respiratory condition, generalized peritonitis, intestinal ileus or obstruction and abdominal hernia were excluded from the study.

After being approved by the institutional review board (IRB) of Rashid Latif Medical Complex (RLMC), 179 female participants who fulfilled the inclusion and exclusion criteria were enrolled in the study. All of the study participants were provided details about the conduct of the study, including the details of the procedure.

They were also informed about their right to withdraw from study, at any time, without having any fear of refusal of treatment. A written informed consent was obtained from each study participant, mentioning their willingness to participate in the study and for use of their data for study and publication. Demographic information i.e. age, years since marriage and duration of subfertility were collected. Complete history and examination were done and recorded. Patients were admitted for diagnostic laparoscopy in premenstrual phase of menstrual cycle. After taking anesthesia fitness and NPO for 8-10 hours diagnostic laparoscopy was carried out under general anesthesia. During the procedure aseptic measures were ensured. Bladder was emptied. Bimanual examination under anesthesia was done, routine procedure of diagnostic laparoscopy was carried out. Pelvis was inspected including uterus, fallopian tubes, ovaries and pouch of Douglas. The patency of fallopian tubes was assessed by injecting methylene blue dye into the uterine cavity and observing its spillage through the fimbrial ends. After the procedure, patients were shifted to postoperative ward for observation and shifted to the ward after complete recovery from anesthesia. They were allowed to take oral fluid when bowel sounds become audible. They were discharged after an overnight stay in the hospital. All data was entered on a pre designed proforma and analyzed using SPSS version 22. Mean \pm S.D was used for quantitative data like age, duration of marriage and duration of subfertility. Frequency and percentage were used for categorical data like types of subfertility, laparoscopic findings. Data was stratified for age, types of subfertility, duration of subfertility to address the affect modifiers.

RESULTS

The mean age of females was 29.12 \pm 4.04 years with minimum and maximum age as 19 and 42 years. The mean duration of marriage was 7.13 \pm 3.66 years with minimum and maximum duration of marriage as 3 and 17 years. The mean duration of subfertility was 5.32 \pm 3.26 years with minimum and maximum duration of subfertility as 2 and 18 years. (Table 1)

There were 137(76.5%) of the cases who had primary and 42(23.5%) females had secondary subfertility. A total of 56(31.2%) females had tubal factors and 123(68.7%) females did not have tubal factors as cause of subfertility. (Table 2)

Table-1: Descriptive statistics of Study Population

Age (years)	
Mean	29.12
S.D	4.04
Range	23
Minimum	19
Maximum	42
Duration of marriage (months)	
Mean	7.13
S.D	3.66
Range	14.00
Minimum	3.00
Maximum	17.00
Duration of Subfertility (years)	
Mean	5.32
S.D	3.26
Range	16
Minimum	2
Maximum	18

Table-2: Distribution of patients according to tubal factors

Factor	Number of participants	Percentage
No factor Found	123	68.7%
Peri tubal Adhesions	39	21.8%
Tubo Ovarian Mass	17	9.5%

Table-3: Distribution of patients according to tubal Patency

Status	Number of Participants	Percentage
Patent	139	77.6%
Blocked Tubes	40	22.3%

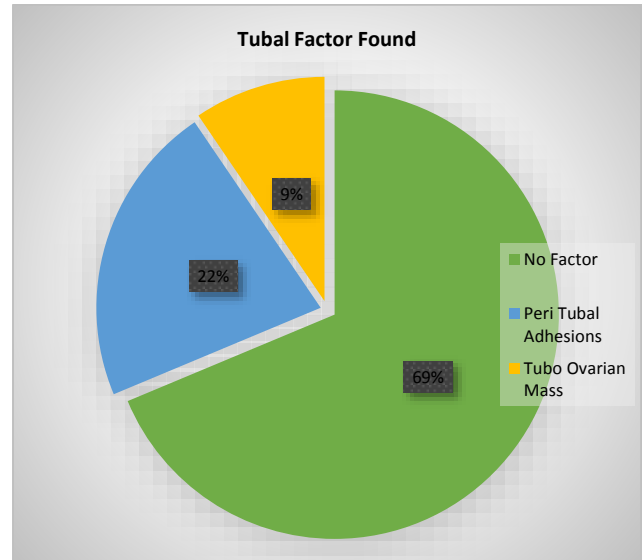


Fig-1: Distribution of tubal factor found

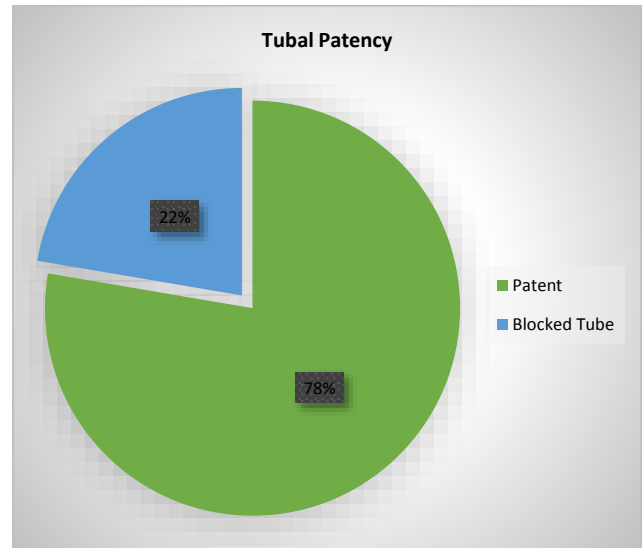


Fig-2: Distribution of Tubal Patency

DISCUSSION

The high rate of subfertility and childlessness is one of the most common and unappreciated health problems in underdeveloped countries. It's tragic that a couple's infertility is seen as a curse, as it affects not only the couple but also their children, extended family, and community.⁹ Globally, 8-10% of couples are subfertile, though this number varies greatly across areas. Primary subfertility and secondary subfertility each account for ¹⁰ of the cases.

Couples who have trouble getting pregnant within a year of engaging in unprotected sexual activity are said to be experiencing primary subfertility, whereas those who are unable to conceive after a pregnancy has been carried to term are said to be experiencing secondary subfertility. Most cases of female factor subfertility can be traced back to a dysfunction of the tubal lining. Pelvic inflammatory illness and acute salpingitis are the leading causes of tubal factor subfertility. After one episode of pelvic

infection, the risk of tubal damage is about 12%, after two episodes it rises to 23%, and after three episodes it reaches 54%.¹¹

Inflammation, endometriosis, and surgical trauma are just a few of the pathologic processes that can harm the proximal, distal, and peritubal regions. Because of the damage done to the fallopian tube, fertility suffers when tubal disease is present. The degree of tubal disease determines the chance for conception. In order to develop a strategy for treating infertility, it is essential to examine the fallopian tubes.¹² Multiple diagnostic options exist for determining tubal health. Laparoscopy, hysterosalpingogram, and saline sonography can all be used to diagnose tubal patency in infertile women. When evaluating tubal patency and the presence of adhesions, hysterosalpingography (HSG) is frequently used as a first-line method; however, HSG has limitations in diagnosing tubal disease¹³.

Laparoscopy and chromopertubation is widely considered as the gold standard test for investigating tubal patency. It allows assessment for peritubal disease, adhesions and endometriosis. This has led to the recommendation by the NICE (UK) that women suspected of having comorbidities (such as endometriosis and pelvic inflammatory disease should undergo laparoscopy so that pelvic and tubal pathology can both be assessed¹⁴.

In our study the mean age of participants was 29.12 ± 4.04 years with minimum and maximum age between 19 and 42 years. There were 137(76.5%) cases who had primary and 42 (23.5%) participants had secondary subfertility which is comparable to the study done by Omokanye LO et al where the participants were aged 21-50 years with a mean age of 33.2 ± 6.6 years and mean duration of subfertility 5.7 ± 5.5 years¹⁵. Similarly study done by Yasir N. et al demonstrated mean age of participants 30.14 ± 4.04 years and mean duration of subfertility was 9.5 years²

In our study, a total of 56 (31.2%) females had tubal factors while 123 (68.7%) females did not have tubal factors as cause of subfertility. Amongst the participants who had tubal factor present, 39(21.8%) females had peri tubal adhesion and 17(9.5%) females had tubo ovarian mass which can be compared with the study results of Yasir N. et al who demonstrated adhesions in 27.4% and tubo ovarian mass in 9.1% of the study population². Among the 179 participants, 40 (22.3%) participants had bilateral blocked tubes. These results are in comparison to the study done by Aziz N who showed the tubal occlusion in 26% of the study participants¹⁶. Another study was done by Chaudhari AD et al.¹⁷ to determine the role of laparoscopy in the evaluation of tubal factor in subfertile women. Diagnostic laparoscopy and findings of chromopertubation revealed bilateral blockage in 23%.

In 2013, Nahar S et.al examined the female pelvis by laparoscopy in 1200 patients and found the tubal and peritoneal factors as the leading causes of female subfertility with tubal factor present 15.8% had peritubal adhesions and 18.4% had bilateral blocked tubes while no tubal factor was identified in 52%¹⁸.

CONCLUSION

Through the findings of our study, we concluded that 34.6% females had tubal factors as a cause of subfertility with 21.8% females having peri tubal adhesion, 9.5% females had tubo ovarian mass. 22.3% of the study population had bilateral blocked tubes. These results co relate with both international & national studies done to evaluate tubal factor as cause of female factor subfertility. These results highlight the importance of diagnostic laparoscopy as a superior tool for evaluation of female patients with inability to conceive. Before prescribing ovulation induction or other treatments for sub fertile females, they should be evaluated by diagnostic laparoscopy to evaluate for tubal factor factors so

that targeted therapy may be given. Such practice of prescribing medication without proper evaluation of pelvic pathology should be discouraged by our local practitioners. As tubal pathology has a high percentage of being the causative factor of female subfertility, measures should be taken to address this by promoting health education about barrier contraception, awareness about sign and symptoms of PID with early contact to health care provider, diagnosis and treatment of tuberculosis, promotion of post-abort and post-partum hygiene.

Acknowledgement: Authors are thankful to Prof Sohail K. Lodhi and Prof. Yousaf Latif for providing guidance to conduct this study at our institution.

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