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A Prospective Study on Laparoscopic Evaluation of Tubal Factors with Polycystic Ovarian Syndrome and Infertility in Bangladeshi Patients

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Abstract **Original Research Article**

***Background*:** Laparoscopic evaluation plays a crucial role in assessing tubal factors in infertility cases coexisting with polycystic ovarian syndrome (PCOS). PCOS, characterized by hormonal imbalances and ovarian cysts, often leads to irregular ovulation and infertility. Laparoscopy allows for direct visualization of the fallopian tubes, identifying any obstructions or abnormalities that may hinder conception. Understanding the tubal status in PCOS-related infertility helps tailor treatment strategies, optimizing the chances of successful conception for affected couples. ***Objective*:** In this study or main goal is to evaluate the tubal factor pathology in case of infertile patients with diagnosed PCOS by laparoscopy. ***Method*:** This retrospective study was carried out at tertiary medical hospital from 2022 to 2023 where a total of 100 women who were diagnosed case of infertility with PCOS included in the study. Among these 68 % were primary infertility and 32% were secondary infertility. ***Results*:** During the study, in primary infertility 70.59% patient had no history of contraception. Only 8.82% had taken oral pill and 20.59% used barrier method. In secondary infertility had no history of contraception 25% had taken oral pill, 6.25% had taken IUCD and 6.25% used barrier method. Laparoscopic study of fallopian tube showed in primary infertility the tube of the right side was normal looking in 52 (76.47%), peritubal adhesion was present in 12 (17.65%) and hydrosalpinx was present in 4 (5.88%) cases. The tube of the left side was normal looking in 50 (73.53%), peritubal adhesion was present in 10 (14.71%) and hydrosalpinx was present in 8 (11.76%) cases. In secondary infertility the tube of the right side was normal looking in 16 (50.00%), peritubal adhesion was present 8 (25.00%) hydrosalpinx in 6 (18.75%) and the tube was absent in 2 case. In the left side the tube was normal looking in 20 (62.50%), peritubal adhesion was present in 8 (25.00%) and hydrosalpinx in 4(12.50%) cases. ***Conclusion*:** Without laparoscopic examination, investigation of female sub fertility is incomplete. In our country laparoscopic facility is available only in few centres as its use requires considerable expertise. So there should be more supports and opportunities for making enough competent laparoscopists. Then the infertile couples will be benefited from it and achieve their goals of infertility.

Keywords: Laparoscopic evaluation, tubal factors, polycystic ovarian syndrome (PCOS).

INTRODUCTION

Infertility is defined as the inability of a couple to conceive after one year of frequent, unprotected intercourse. While it is seldom a physically debilitating disease, it severely affects the couple's psychological well-being. Approximately 10-15% of couples experience infertility, with sterility (an intrinsic inability to achieve pregnancy) affecting 1-2% of couples. The prevalence of infertility ranges from 7-28%, depending on the age of the woman. About half of infertility cases are primary, where no previous pregnancy has occurred, while the other half are secondary, where previous conception, though not necessarily resulting in a live birth, has occurred. Primary infertility is more often linked to male factors, whereas secondary infertility is more often due to female factors [1, 2].

Infertility is a common issue, affecting approximately one in six couples. The causes of infertility vary by country and social group and can stem from either partner or both. An etiology for infertility can

be identified in 80% of cases, with an even distribution of male and female factors, and some couples presenting with multiple factors. Male factors account for approximately 25% of cases, while ovulatory dysfunction, tubal, and peritoneal factors are major causes of female infertility. In 15-20% of couples, the cause remains unexplained.

Polycystic ovarian syndrome (PCOS) is a common cause of anovulation and infertility in women. Characterized by multiple small ovarian cysts, hyperinsulinemia, adult-onset diabetes, hypertension, and an atherogenic lipid profile, PCOS leads to irregular ovulation and menstrual cycles. Tubal pathology is another significant cause of female infertility, affecting 14% of couples and 40% of infertile women [3, 4]. The fallopian tubes play a crucial role in fertilization and early embryo development, so any damage can lead to infertility or ectopic pregnancy. Tubal impairments include defective ovum pick-up, impaired motility, loss of cilia, and complete obstruction, often due to infections, surgery, or endometriosis.

Laparoscopy is a transperitoneal endoscopic technique that provides excellent visualization of pelvic structures, allowing for the diagnosis and treatment of gynecological disorders without the need for laparotomy. It should be performed by trained physicians capable of managing common complications and performing additional therapeutic procedures as needed. Laparoscopy is increasingly used alongside hysteroscopy in the early assessment of infertility, though it is not without risks such as infections, hematomas, and injuries to the bowel and major blood vessels. Studies indicate that about 50% of laparoscopy cases reveal unsuspected pelvic pathology. Mechanical issues are more frequent in secondary infertility, with common findings including tubal damage, endometriosis, and pelvic inflammatory disease (PID) [2, 1].

Objectives

The aim of this retrospective study is to evaluate the role of laparoscopy in assessing primary versus secondary infertility and to investigate tubal factor pathology in infertile patients diagnosed with PCOS.

METHODOLOGY

Types of the study:

- This was a retrospective study.

Place and period of the study:

- This study was carried out at tertiary medical hospital from 2022 to 2023.

Sample size:

- A total of 100 women who were diagnosed case of infertility with PCOS included in the study. Among these 68 % were primary infertility and 32% were secondary infertility.

Inclusion criteria:

- Diagnosed case of infertility with PCOS
- PCOS was diagnosed according to Rotterdum criteria (2003)
- either 2 must be present-
    - Oligo or anovulation
    - Hyperandrogenism (clinical and or biochemical)
    - Ultrasonographic evidence of Polycystic ovaries
    - Informed consent

Exclusion criteria:

Following categories were excluded from this study –

- Male factor causes like abnormality in sperm analysis, abnormality in sexual function were excluded from this study
- Women more than 40 years and less than 20 years were excluded
- Hypothyroidism / hyperprolactinaemia
- Diabetes mellitus
- Premature ovarian failure

Methods:

Data collected for each individual subject were recorded on a predesigned data collection form for each participant. Before admission, detailed history was taken from Gynae out patient department from both husband and wife. Then clinical examination was done. After a detailed history and clinical examination, a set of basic investigations were done and include.

- Blood: TC, DC, Hb%, ESR
- Blood sugar, Blood grouping & Rh typing
- Urine: R/M/E.
- HBsAg
- Semen analysis of husband.
- X-ray chest P/A view.
- USG of lower abdomen

RESULTS

The study analyzed infertility among women aged 20-39 years, distinguishing between primary and secondary infertility. In the 20-29 age group, 64.71% (44 out of 68) experienced primary infertility, while 62.5% (20 out of 32) faced secondary infertility. Among women aged 30-39, primary infertility was reported by 35.29% (24 out of 68), whereas 37.5% (12 out of 32) reported secondary infertility. This data highlights a higher prevalence of infertility, particularly primary infertility, in the younger age group.

Table 1: Age distribution of infertile female patient

Age (in years)	Primary Infertility		Secondary Infertility	
	Frequency	Percentage (%)	Frequency	Percentage (%)
20-29	44	64.71	20	**62.5**
30-39	24	35.29	12	**37.50**
Total	**68**	**100**	**32**	**100**

Chronic pelvic pain was more prevalent in secondary infertility cases (43.75%) compared to primary infertility cases (17.65%). Dysmenorrhoea was reported by 29.41% of women with primary infertility and 31.25% with secondary infertility. Dyspareunia was noted in 23.53% of primary infertility cases and 18.75% of secondary cases. Regarding discharge, 58.82% of women with primary infertility experienced mild discharge, 52.94% moderate, and 2.94% severe/excess. In contrast, 75% of women with secondary infertility had mild discharge, 56.25% moderate, and 6.25% severe/excess, with an additional 12.5% experiencing severe/excess discharge.

Table 2: **Comparison of complaints between primary infertility & secondary infertility**

Complaints	Primary (n=68)		Secondary (n=32)	
	No	Percentage (%)	No.	Percentage (%)
1.Chromic pelvic pain	12	17.65	14	**43.75**
2.Dysmenorrhoea	20	29.41	10	**31.25**
3. Dyspareunia	16	23.53	6	**18.75**
4. Discharge	**40**	**58.82**	**24**	**75.00**
Mild	**36**	**52.94**	**18**	**56.25**
Moderate	**2**	**2.94**	**2**	**6.25**
Severe / Excess	**2**	**2.94**	**4**	**12.50**

Among those with primary infertility, 70.59% had no history of contraception use, 8.82% used oral pills, none used intrauterine contraceptive devices (IUCD), and 20.59% used barrier methods. For secondary infertility, 62.5% had no history of contraception, 25% used oral pills, 6.25% used IUCDs, and another 6.25% used barrier methods.

Table 3: Contraceptive history of infertility cases

History of Contraception	Primary Infertility		Secondary Infertility	
	No.	Percentage (%)	No.	Percentage (%)
No H/o contraception	48	70.59	20	**62.50**
Oral pill	6	8.82	8	**25.00**
IUCD	0	0.00	2	**6.25**
Barrier method	14	20.59	2	**6.25**
Total	**68**	**100**	**32**	**100**

The majority, 88%, had no significant past medical or surgical history. Appendicitis was reported in 6% of the patients, while ectopic pregnancy, salpingitis, and pulmonary tuberculosis each affected 2% of the patients. There were no reported cases of puerperal sepsis.

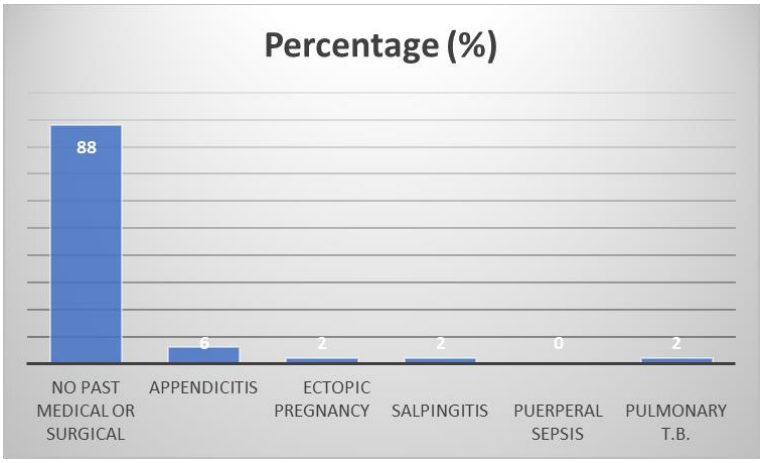

Figure-1: Relevant past history of 100 cases of infertility

The study's obstetrical history of 32 patients revealed that 50% had given birth to at least one living child. Among these, 18.75% had experienced stillbirths, 12.5% intrauterine fetal deaths (IUFD), and 12.5% had a child who later died. Additionally, 31.25% of the patients had a history of abortion, and 18.75% had undergone menstrual regulation (MR).

Table 4: Obstetrical History of Secondary infertility case (n=32)

Obstetrical History	No. of Patient	Percentage (%)
Para 1 or more	**16**	**50.00**
One alive child	**6**	**18.75**
Still birth	**4**	**12.50**
IUFD	**2**	**6.25**
Dead	**4**	**12.50**
Abortion	**10**	**31.25**
MR	**6**	**18.75**

For primary infertility, 76.47% had normal-looking right fallopian tubes and 73.53% had normal left fallopian tubes. In contrast, 50% of those with secondary infertility had normal right fallopian tubes, and 62.5% had normal left fallopian tubes. Peritubal adhesions were present in 17.65% (right) and 14.71% (left) of primary infertility cases, while 25% of secondary infertility cases had peritubal adhesions on both sides. Hydrosalpinx was observed in 5.88% (right) and 11.76% (left) of primary infertility cases, compared to 18.75% (right) and 12.5% (left) in secondary infertility cases. Notably, 6.25% of secondary infertility cases had absent right fallopian tubes, with none absent on the left.

Table 5: Morphological changes of fallopian tubes in Primary & Secondary infertility

Morphological	Primary Infertility				Secondary Infertility			
	Right		Left		Right		Left	
	No.	(%)	No.	(%)	No.	(%)	No.	**(%)**
Normal looking	52	76.47	50	73.53	16	50.00	20	**62.50**
Peritubal adhesion	12	17.65	10	14.71	8	25.00	8	**25.00**
Hydrosalpinx	4	5.88	8	11.76	6	18.75	4	**12.50**
Absent	**0**	**0.00**	**0**	**0.00**	**2**	**6.25**	**0**	**0.00**

For those with primary infertility, 76.5% had normal right fallopian tubes and 73.53% had normal left fallopian tubes. Conversely, in secondary infertility cases, 50% had normal right fallopian tubes and 62.5% had normal left fallopian tubes. Agglutinated fallopian tubes were found in 17.6% of both the right and left tubes in primary infertility cases, while in secondary infertility cases, 31.25% of both right and left tubes were agglutinated. Tubes that were not properly visualized accounted for 5.9% (right) and 8.82% (left) in primary infertility cases, and 12.5% (right) and 6.25% (left) in secondary infertility cases.

Table 6: Condition of the fimbria in infertility

Morphological	Primary Infertility				Secondary Infertility			
	Right		Left		Right		Left	
	No.	(%)	No.	(%)	No.	(%)	No.	**(%)**
Normal	52	76.5	50	73.53	16	50.00	20	**62.50**
Agglutinated	12	17.6	12	17.65	10	31.25	10	**31.25**
Not Properly Visualized	**4**	**5.9**	**6**	**8.82**	**4**	**12.5**	**2**	**6.25**

For primary infertility, the dye test was positive in 70.59% of right tubes and 82.35% of left tubes. In comparison, secondary infertility cases showed a positive dye test in 62.5% of right tubes and 75% of left tubes. Negative results were observed in 26.47% (right) and 17.65% (left) of primary infertility cases, whereas secondary infertility cases had 31.25% (right) and 25% (left) negative results. Additionally, 2.94% of primary infertility cases had a doubtful result in the right tube, with no doubtful results in the left tube or in any of the secondary infertility cases.

Table 7: Tubal patency by dye test

Result	Primary Infertility				Secondary Infertility			
	Right		Left		Right		Left	
	No.	(%)	No.	(%)	No.	(%)	No.	**(%)**
Dye test +ve	48	70.59	56	82.35	20	62.50	24	**75.00**
Dye test -ve	18	26.47	12	17.65	10	31.25	8	**25.00**

Doubtful	**2**	**2.94**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**

In primary infertility both tubes were patent in 46 (68%), only one tube was patent in 12 (17.00%) and both tubes were blocked in 10 (15%). On the other hand in secondary infertility both tuber were patent in 18(56%) cases, only one tube was patent in 8 (25%) and both tubes were blocked in 6 (19%) cases.

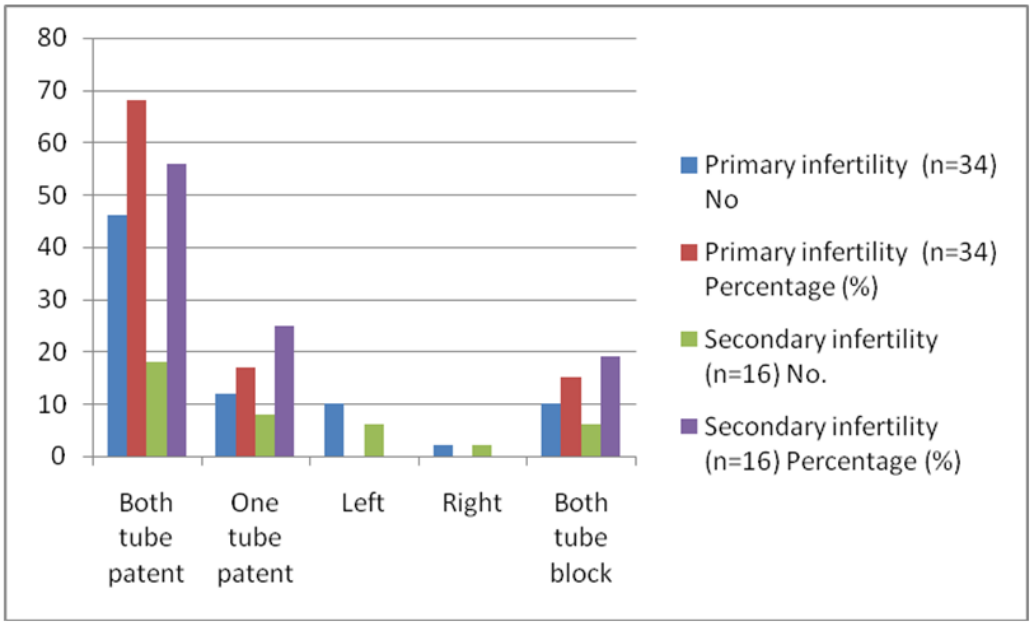

Figure-2: Tubal Patency test in primary & secondary infertility

DISCUSSION

In this study out of 100 infertility patients about 68% had primary and 32% had secondary infertility. A study made by in 2003 also showed 69% had primary and 30% had secondary infertility [4]. Another study showed 57% had primary and 30% had secondary infertility [5].

In this study out of 100 cases 64% were above the age of 25 years and they had already passed the age of optimal fertility (25-29yr) when they were ready to have children and therefore created a problem as regards to fertility.

When considering the duration of infertility mean duration is 6.8 years in this study. This differs from the another study where majority of the patients came for investigation after 2-5 years [6].

In this study, use of contraceptive by the majority of the infertile couples was almost nil. About 67% couples had never used any type of contraceptive method, only 17% had used hormonal contraceptive pills for short period (3-8 months), 13% used barrier method and only 6% used IUCD in case of secondary sub-fertility. Similar study showed that 78% couples had never used any type of contraceptive, only 16% women used hormonal contraceptive and remaining 6% used barrier methods [7].

A normal fallopian tube is needed for ovum transport, fertilization and transport of fertilized ovum to the uterus. Any abnormality of fallopian tube interface fertility. No laboratory test is available for determination of physiological functions of the fallopian tube. By laparoscopy we can find out anatomical integrity of tube i.e. tubal patency. Incidence of pathology of fallopian tube varies according to sexually transmitted disease, post abortal and puerperal infection. In this study in primary infertility both tubes were found to be blocked in 15%, only one tube patent in 17% and both tubes were patent in 68%. In secondary infertility both tubes were patent in 56% cases. Similar findings were observed by Chowdhury S and Chowdhury T.A in case of primary infertility but not in secondary in fertility where tube blockage was found in 15% in the former and 17.5% in the later group.

This finding is much lower than series where the tubal occlusion was present in 82.8% cases. In the present study peritubal adhesion was present in 17.65% at right and 14.7% at left side in primary infertility. In secondary infertility it was present in 25% at both sides [8].

Hydrosalpinx was found in 5.9% in the right side and 11.76% in the left in primary infertility and 18.75% and 12.5% in right and left side respectively in secondary infertility.

Here tubal pathology (peritubal adhesion and hydrosalpinx) were seen to be more common in secondary infertility cases than the primary infertility. This increased prevalence of peritubal adhesion and hydrosalpinx in secondary infertility might be relate to history of abortion, MR, still birth and IUCD insertion which are 31.25%, 18.75%, 12.5% and 6.25 respectively in this study.

Another study reported that, where secondary infertility, following post abortion 59.10%, MR 16%, still birth 9.1%, past obstetric history is important in cases of secondary sub-fertility. But the prevalence of peritubal adhesion and hydrosalpinx in primary infertility where there was no such history was not negligible. Here pathology might be related to gonococcus or Chlamydial infection causing asymptomatic pelvic inflammatory diseases (PID) [9].

It was seen that in secondary infertility peri tubal adhesion, hydrosalpinx and tubal blockage were more common in right side than in the left side but it was not true for the primary infertility. This higher prevalence of tubal pathology in the right side might be related to the appendix, a structure which lies in right side of pelvis.

Bilateral tubal occlusion was found in 35.3% by laparoscopy in infertile female patients of Nigeria39 which was higher than this study. The higher prevalence might be due to more STDs in Nigeria than ours because of less conservative attitude of that society. It should be emphasized that laparoscopy is the most important investigating method for evaluation of the tubal factors, as the findings missed on hyterosalpingography are diagnosed on laparoscopy and for management of both primary and secondary infertility. It is an essential step prior to any anticipated intervention as it provides essential information regarding the nature and extent of future surgery.

In this study there was a strong correlation between the tubal blockage and history of MR, abortion and stillbirth. In secondary infertility in 6 (18.75%) cases there was a history of MR and both of them were association with unilateral tubal blockage and peritubal adhesion.

In 10(31.25%) cases there was a history of spontaneous abortion but half of them had no tubal pathology and both tubes were fond to be patent. Only in 2 case there was bilateral tubal blockage and in 6 (18.75%) cases hydrosalpinx. In 4 (12.5%) cases there was a history of stillbirth. Of them, one was associated with bilateral tubal blockage and two with unilateral tubal blockage.

When this study was compared with another study done in sub-Saharan countries, it was found that, in secondary infertility 25% cases had a history of MR and majority of them had unilateral tubal blockage [5].

Review of medical and surgical history showed that in 6% cases there was a history of appendicitis. One case later on, had a ectopic pregnancy and right sided salpingo-oophorectomy was done. The other case had right sided tubal blockage. In 2% case there was a past history of pulmonary tuberculosis but laparoscopically both tubes were completed healthy and patent. But in this case menstrual cycle was irregular which might be associated with an ovulation.

Another study 6% cases has a past history of pulmonary tuberculosis and all of them were in primary infertility group and in them laparoscopy showed both tubes were blockage in 2 cases [6].

In this study only 2% case had a history of IUCD insertion and here the Right tube was found blocked and there was peritubal adhesion. Tubal blockage was more frequent in the right in both primary and secondary infertility. There was as strong correlation between tubal pathology and history of MR, abortions, still birth, IUCD and appendicitis. The study showed that tubal blockage is an important cause of infertility in Bangladesh though it was not high as found in Africa and other western countries.

CONCLUSION

Infertility brings a tragic dimension to the family life of many couples. The causes of infertility vary by country and social group, with tubal occlusion from post-childbirth or abortion infections and tuberculosis being significant factors. Preventative measures include expanding access to medical services where they are scarce. In this country, many infertile couples seek investigation late due to ignorance, poverty, and poor communication facilities. Investigating female subfertility is incomplete without laparoscopic examination, but this service is limited to a few centers due to the expertise required. Therefore, increasing support and opportunities to train competent laparoscopists is essential to benefit infertile couples and help them achieve their goals.

REFERENCE

1. Pratap, K., & Narendra, M. (2008). Jeffcoate's principles of gynaecology, 7th edition, 2008:699.
2. Keith, E. (2007). Dewhurst's textbook of Obstetrics and Gynaecology, 7th edition, 2007:440.
3. Alan, H. D., Lauren, N., Murphy, G., & Neri, L. (2001). Current Diagnosis and Treatment of Obstetrics and Gynaecology, 10th edition, 2001: 917.
4. Christopher, N. H., & Marcus, E. S. (2001). Shaw's textbook of operative gynaecology. 6th edition, 2001: 44. on developing countries and infertility.

5. Rudi Campo and Carlos Roger Molinas. Modern endoscopic based exploration of the female reproductive tract, a model for reproductive medicine, ESHRE Special task force on 'Developing countries and infertility'. 2008, july, 54.
6. Gautum, N. A. (2006). Rubina Merchant. Gynaecological endoscopy and Infertility, 1st edition, 2006; 331.
7. Yedidya, H., Eliezer, H., Miriam, A., & Chaim, Y. (1998). *Journal of Assisted Reproduction and Genetics, 15*(9), 535.
8. Cahill, D. J., Cooke, I. E., & Darling, M. R. N. The influence of laparoscopy on infertility. Rotunda hospital, Parell square, Dublin, 1, 50.
9. Chowdhury, S., & Chowdhury T. A. (1992). Laparoscopic assessment of tubal factors in infertility. *Bangladesh J Obstet Gynaecol*, *7*(1), 9-16.
10. Philips, J. M., Corson, S. L., Keith, L., Levenson, K. J., & Yuzpe, A. A. (Eds). (1977). Laparoscopy. Baltimore, Williams and Wilkins.