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ORIGINAL ARTICLE

Evaluation of Female Infertility Factors Through Diagnostic Laparoscopy: a Cross Sectional Study

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ABSTRACT

Aim: To evaluate the factors behind primary and secondary infertility in females through diagnostic laparoscopy.
Study design: Cross sectional study
Place and duration: This study was conducted at Bilawal Medical College Kotri Hospital/Liaquat University of Medical and Health Sciences Jamshoro, Pakistan from June 2019 to July 2020
Methodology: The present study is a cross sectional study conducted at at Bilawal Medical College Kotri Hospital/Liaquat University of Medical and Health Sciences Jamshoro, Pakistan from June 2019 to July 2020. A total of 115 females were included in the study and they all underwent diagnostic laparoscopy after setting strict inclusion criteria. Data was recorded on proforma and analyzed on IBM SPSS version 22. Primary and secondary infertility frequency was calculated and analyzed.
Result: A total of 115 infertile women were considered in the study and results were recorded after performing diagnostic laparoscopy on all of the participants. Total 74 (64.35%) had primary infertility and 41 (35.65%) reported secondary infertility. Total 19 (25.67%) participants of primary infertility and 5 (12.19%) participants with secondary infertility showed no abnormality. The most common abnormality found was tubal blockage in 17 (22.97%) women of primary infertility and 13 (31.70%) women of secondary infertility. Total 11 (14.86%) patients of primary infertility were diagnosed with polycystic ovaries (PCO). PCO was absent in patients with secondary infertility. Total 9 (12.16%) cases of primary infertility and 5 (12.19%) cases of secondary infertility were diagnosed with Endometriosis. Total 2 (2.7%) cases of primary infertility and 7 (17.07%) participants with secondary infertility presented with Pelvic Inflammatory disease (PID). A total of 6 (8.10%) cases having primary infertility were observed with periovarian adhesions and Peritubal adhesions, whereas, 9 (21.95%) cases of secondary infertility were seen with these issues.
Conclusion: Tubal occlusion, periovarian adhesions, peritubular adhesions, and endometriosis were the most common factors behind infertility in both primary and secondary infertility. Ovarian cyst and polycystic ovarian disease were only present in patients with primary infertility.
Keywords: Diagnostic Laparoscopy, Primary infertility tubal occlusion, Secondary infertility

INTRODUCTION

Infertility is a common issue and it affects about one in six couples. It can be defined as the inability of a couple to conceive even after sexual intercourse for a reasonable period of time, without using any kind of contraception method. It is difficult to establish the exact reason behind this prevalence. However, some common factors are delay in childbearing, altered sexual behavior, and bad semen quality because of smoking and alcohol addiction. Female factors of infertility are more common than male factors. The focus during investigating the causes of female infertility is mainly on ovulatory factors, utero-tubal peritoneal factors, uterine abnormalities, cervical abnormalities, damage or blockage of fallopian tubes, endometriosis, early menopause, pelvic adhesions, cancer, and its treatment. In males, semen migratory factors, quality of semen, and quantity of semen are focused [1]. In 40% of infertility cases, a combination of reasons is seen, whereas, reasons remain undefined in 15% of the cases [2]. The prevalence of infertility in Pakistan is 21.9%. About 4% of them have primary infertility while 18% of them have secondary infertility [3]. Identification of the reason leads to successful treatment. Problem with sperm delivery, exposure to environmental factors, cancer, and its treatment are some other male factors of infertility.

The workup to identify the cause of female infertility begins with acquiring detailed history and performing the examination. History has great significance in such cases. Period of intercourse, use of contraception, and societal factors are asked. After history and examination, some necessary investigations are performed. On the initial level, invasive techniques are avoided. Most predictive laboratory investigations are carried out first on the basis of the history provided [4]. For instance, if the history is consistent with polycystic ovarian disease (PCO) then hormone levels are assessed and the status of ovaries is evaluated on ultrasonography. Diagnostic laparoscopy is not generally a component of the initial investigation. However, it has been noticed from multiple research studies that it is an effective technique for a definitive diagnosis [5]. Status of fallopian tubes, ovaries, uterine abnormalities, and pelvic pathologies such as endometriosis, pelvic inflammatory disease (PID), tuberculosis, and pelvic congestion can be seen through a diagnostic laparoscopy [6]. It is an effective technique to find out the patency of tubes. About 21.68% of cases have presented definitive diagnosis through

laparoscopy followed by hysterosalpingography [7]. Common reasons for secondary infertility are PID, retained product of conception after abortion, tuberculosis, and postpartum infection. The present study was carried out for the determination of causes of infertility in females through diagnostic laparoscopy.

METHODOLOGY

The present study is cross sectional study. It was carried out at Bilawal Medical College Kotri Hospital/Liaquat University of Medical and Health Sciences Jamshoro, Pakistan from June 2019 to July 2020. A total of 115 participants were selected for the study. Permission was taken from the ethical review committee of the institute. Women who could not conceive in more than 12 months after repetitive efforts were considered in the study. Total 74 (64.35%) women had primary infertility and 41 (35.65%) women had secondary infertility. A strict exclusion criterion was set according to which couples who had not been living together for 12 months, women who had contraindication regarding laparoscopy, and couples who were positive for male infertility were not included in the study. Moreover, the patients who had a pre-existing respiratory condition, cardiovascular condition, intestinal ileus, obstruction, generalized peritonitis, and any kind of hernia were also not included in the study.

The history of all the patients was taken in detail and recorded on proforma. A clinical examination was done. Some laboratory investigations were considered compulsory for all the participants to rule out the cause of infertility. These investigations included hormone profiles such as Luteinizing hormone, follicle-stimulating hormone, thyroid-stimulating hormone, progesterone, prolactin, and testosterone. In addition to that, an abdominal ultrasound of all the participants was also done to confirm if the diagnosis can be made on imaging or the patient is a potential candidate for the invasive technique.

A total of 115 infertile women were selected for laparoscopy. Patients were guided that they would have to come to the hospital in the premenstrual stage of their monthly cycle for laparoscopy. They were guided and counseled about the study and informed written consent was taken for both the laparoscopy and participation in the study. Laparoscopy was carried out in such a way that the pelvis of the patients was thoroughly inspected, the uterus checked along with fallopian tubes, pouch of Douglas, round ligament, uterosacral ligament, and ureterovesical pouch. Patency of fallopian tubes was inspected by injecting Gention violet or methylene blue dye in the uterine and the fimbrial end was then checked for spillage of the dye. The shape and length of the tubes were examined. Shape, size, the thickness of follicles, affirmation of ovulation with respect to fimbrial tubes was examined in both ovaries. Any presence of pathology in the pelvis, fluid present in the pouch of Douglas, fibroids, endometriosis, tubo-ovarian masses, Peritubal adhesions, periovarian adhesions, and omental adhesions were also ruled out. In addition to making a diagnosis, dilatation and curettage were also performed in patients who had menstrual abnormalities, endometriosis, and endometrial tuberculosis. The curetted tissue was then sent for histopathology. All the data was recorded and analyzed in the IBM SPSS version 22.

RESULT

The present study included a total of 115 participants. The ratio of patients who had primary infertility was almost two times the patients who had secondary infertility. There were 74 (64.35%) patients with primary infertility and 41 (35.65%) patients with secondary infertility. The mean duration of infertility in the case of primary infertility was 3.4±0.6 years and in the case of secondary infertility, it was 6.9±1.2 years. The mean age of patients who had presented with primary infertility was 27.4±3.1 years. The mean age of participants who had secondary infertility was 33.4±7.5 years.

Out of 74 patients with primary infertility, 19 (25.67%) participants had no visible abnormality. A total of 55 (74.32%) had multiple symptoms such as pain in the pelvis, dysmenorrhea, dyspareunia, irregular menstrual cycle, excessive weight gain, hirsutism, menorrhagia, and secondary amenorrhea. Total 74.32% were identified with different issues on diagnostic laparoscopy as mentioned in table 1.

In the case of secondary infertility, 5 (12.19%) of the patients had no visible abnormality on laparoscopic examination. These participants had similar symptoms as those of primary infertility patients. The findings of laparoscopy are shown in table 2. It can be noted from the data that the most common abnormality seen in both primary and secondary infertility was a tubal blockage. The second most common reason for primary infertility was PCO. Ovulatory causes were not detected in participants with secondary infertility. However, periovarian adhesions and peritubal adhesions were the second most common reason for infertility in these participants.

Table 1: Reasons of infertility identified on laparoscopy in participants with primary infertility

Findings	Primary infertility n=74	
	Frequency	Percentage
No abnormality	19	25.67
Tubal blockage	17	22.97
Polycystic ovaries	11	14.86
Endometriosis	9	12.16
PID	2	2.7
Periovarian adhesions and Peritubal adhesions	6	8.10
Fibroids	5	6.75
Ovarian cyst	5	6.75

Table 2: Reasons of infertility identified on laparoscopy in participants with secondary infertility

Findings	Secondary infertility n=41	
	Frequency	Percentage
No abnormality	5	12.19
Tubal blockage	13	31.70
Polycystic ovaries	0	0
Endometriosis	5	12.19
PID	7	17.07
Periovarian adhesions and Peritubal adhesions	9	21.95
Fibroids	2	4.87
Ovarian cyst	0	0

DISCUSSION

Complete assessment of infertility includes investigating the causes in both partners. Some laboratory tests are significant in the identification of the cause. Despite that, diagnostic laparoscopy is considered to be a mandatory procedure to evaluate the definite cause [8]. The age of female participants has a significant role in treatment. Whereas, yet no such standard age is set. Nonetheless, ASRM (American Society of Reproductive Medicine) has considered 35 years as an age limit in terms of fertility [9]. In the present study, a total of 12 participants were above the age of 35 years.

The mean duration of primary infertility was 3.4±0.6 years and in the case of secondary infertility, it was 6.9±1.2 years. None of the cases presented with a duration less than 2.5 years. Ashraf et al reported similar results in their research conducted in Lahore where 58% of participants had primary infertility with a duration ranging from 2 years to 5 years and 71% of participants had secondary infertility with a duration above 5 years. None of his participants had reported primary infertility for less than 2 years [10].

According to the study of Ibrahim et al, diagnostic laparoscopy is not only a significant technique in diagnosing the cause, but it can also help in the treatment in certain cases. They found out that the causes of unexplained infertility were endometriosis and peritubular adhesions. Both of the pathologies can be fixed through laparoscopy. It was also narrated in the conclusion that both these issues are impossible to be detected without laparoscopic intervention [11]. Another similar study was conducted by Niaz et al in Peshawar. The study was conducted on 196 participants. They observed that 45% of the patients with collectively primary and secondary infertility had genital tuberculosis [12].

Another similar study was conducted by Shinde et al. They had additionally combined hysteroscopy with laparoscopy to make a definitive diagnosis. They concluded that combining both diagnostic techniques is vital before starting treatment. According to their results, pelvic adhesions were the commonest root cause in both primary and secondary infertility. Pelvic tuberculosis was also predominant in primary infertility. Uterine anomalies, submucous fibroids, polyps, and Asherman's syndrome were other minor causes [13]. Talat et al also found that tubal blockage was detected more commonly in primary infertility compared to secondary infertility. The same was the case with PID. Similar results were obtained in our study [14].

CONCLUSION

In our study the predominant cause of infertility in both types of cases was a tubal blockage. Ovulatory factors were present in abundance in primary infertility while they were absent in secondary infertility. Diagnostic laparoscopy is a minimally invasive technique to diagnose the actual cause of infertility in both primary and secondary infertility. It has a significant role and should be considered earlier in patients with PID and pelvic pain.

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