

Prevalence of Infertility and Its Causes in the Population of Pakistan: A Cross-Sectional Study

Shumaila Javaid¹, Saima Walidad Mastoi², Erum Jahan³, Sarwat Khalid⁴, Asma Jabeen⁵,
Nidhi Mahajan⁶

1. Shumaila Javaid, Post Graduate Resident Trainee Gynaecology, Sharif Postgraduate Medical Institute/Sharif Medical city Hospital Lahore, Pakistan. email: drsjvd@gmail.com
2. Saima Walidad Mastoi, Gynecologist, Jinnah Postgraduate Medical Center Karachi, Pakistan. email: drsaimaaslam09@gmail.com
3. Erum Jahan, Assistant Professor Gynaecology, Karachi Medical and Dental College Abbasi Shaheed Hospital Karachi, Pakistan. email: Erummustafa@gmail.com
4. Sarwat Khalid, Assistant Professor Gynaecology, Karachi Medical and Dental College Abbasi Shaheed Hospital, Pakistan. email: sarwatsethi500@gmail.com
5. Asma Jabeen, Associate professor Gynaecology, Muhammad Medical Collage Mirpurkhas, Pakistan. email: DrAsmajamshed66@gmail.com
6. Nidhi Mahajan, Specialist Gynaecology, Hamad Medical Corporation, Alkhor Hospital Qatar. email: dr_nidhijmu@yahoo.co.in

Corresponding Author: Shumaila Javaid, Post Graduate Resident Trainee Gynaecology, Sharif Postgraduate Medical Institute/Sharif Medical city Hospital Lahore, Pakistan. email: drsjvd@gmail.com

Abstract

Aim: To determine the prevalence of infertility and its causes in the study population of Pakistan

Study design: Cross sectional study

Place and duration: This study was carried out at Sharif Postgraduate Medical Institute/Sharif Medical city Hospital Lahore, Pakistan from June 2019 to July 2020.

Methodology: A total of 2657 patients visited in OPD during the duration of study period, among them a total of 186 participants with infertility were included in the study. Patients were examined and investigated according to standard protocol. All the patients were investigated for Prolactin level on the 21st day of cycle, abdominal and pelvic ultrasound were also done. A total of 42 (22.58) patients underwent laparoscopy. Hysterosalpingography (HSG) was done in 30 (16.12%) patients.

Results: Out of 2657 patients total 186 (7%) were infertile. Ultrasound, Laparoscopy, and HSG revealed different causes of infertility. About 39 (20.96%) of the cases were related to male infertility, 43 (23.11%) patients were identified with ovulatory failure, 10 (5.37%) patients had sexual dysfunction, 3 (1.61%) had mucus hostility, 48 (25.80%) had normal pelvis, 28 (15.08%) had a tubal blockage, 2 (1.07%) had Tubo-ovarian masses, and 13 (6.98%) participants were diagnosed with Endometriosis.

Conclusion: Infertility is a common issue in the population under study. Female infertility was more common than male infertility. Ovulatory failure was the most common cause of female infertility. Proper diagnosis and management of the root factor can potentially treat infertility and can help in conception.

Keywords: infertility, laparoscopy, ovulatory failure, tubal blockage

Introduction

The natural capacity of a couple to conceive a child is fertility. It is the ability of a man and woman to reproduce. The inability of conception in a natural way for 24 months despite unprotected coitus is referred to as infertility as per the criteria of the World Health Organization [1]. Infertility is a common issue and faced by almost 11% of couples. Its prevalence is almost 6% in married women even after trying to conceive for one year [2]. The reason can be a health issue in either or both partners. Primary infertility is when pregnancy is never achieved. Whereas, secondary infertility can be defined as infertility after at least one pregnancy.

Infertility is not always related to the health issues of women. In 35% of cases, male factors along with female factors are identified to be the cause of the inability of reproduction. In 8% of cases, the male factor is the only cause of infertility. It has been reported that 9% of men between the age of 25 years and 44 years seek treatment for infertility [3]. There are several male factors that are responsible and they are evaluated through analysis of semen. The number of sperms, their morphology, and motility is analyzed. Other factors include dysfunction of ejaculation and testes. Some of the health conditions which are significant in this regard are varicocele, trauma of testes, diabetes, autoimmune disease, cystic fibrosis, infections causing testicular failure, cancer, and its treatment. Other causes can be unhealthy dietary habits, consumption of alcohol, smoking, utilization of steroids, recreational drugs. Hormonal disturbances that lead to infertility in males comprise the inability of proper functioning of the pituitary gland or hypothalamus as the production of excessive prolactin leads to a reduction of sperm count. A genetic condition similar to Klinefelter's syndrome, myotonic dystrophy, and Y-chromosome microdeletion can also potentially reduce the sperm count [4].

To be able to conceive, a woman should have properly functioning ovaries, uterus, and adequate and patent fallopian tubes to aid ovulation. Any factor that disturbs these organs and ovulation can hinder conception causing infertility. A woman who has an irregular cycle is not ovulating. Progesterone level on day 21 of cycle and ovulation prediction kit can help in the prediction of ovulation [5]. However, the most commonly used method of prediction of ovulation is an assessment of follicle-stimulating hormone (FSH) on the 3rd to 5th day of the cycle, antral follicle count (AFC) through a transvaginal ultrasound and anti-müllerian hormone value (AMH). Anovulation is when a female is unable to ovulate and hence, unable to conceive.

There are several factors that are responsible for anovulation such as Polycystic Ovary Syndrome (PCOS), Diminished ovarian reserve external icon (DOR), Functional hypothalamic amenorrhea (FHA), disrupted function of hypothalamus and pituitary glands, premature ovarian insufficiency external icon (POI) and menopause external icon. Factors that can affect the patency of the fallopian tube and obstruct it, infection, history of appendicitis, chlamydia or gonorrhea, and swelling. Patency of the fallopian tubes can be assessed by hysterosalpingogram (HSG), chromopertubation (CP), and diagnostic laparoscopy. Uterine infertility factors such as fibroids or malignancy can be assessed by transvaginal ultrasound, hysteroscopy, and sonohystogram [6].

Female infertility is triggered by the increase in age of the female, smoking, excessive weight loss or gain, consumption of alcohol, emotional stress, and physical stress. It is important to diagnose and treat infertility in time to increase the chances of conception. The medication can be administered on the basis of diagnosis [7].

Methodology

This cross sectional was carried out at Sharif Postgraduate Medical Institute/Sharif Medical city Hospital Lahore, Pakistan from June 2019 to July 2020. Total 2657 patients visited OPD in the given duration of time. They had multiple issues. A total of 186 patients reported infertility in OPD, were considered in this study. Permission was taken from the ethical review committee of the institute.

All the patients were selected after assessing them according to the inclusion criteria. According to the inclusion criteria, only those participants were selected who had been trying to conceive for more than one year, not using any means of protection method, the couple is living together and has not taken any treatment for infertility. An exclusion criterion was also set according to which those couples who had not been living together for the last one year, using contraceptive pills or protection, and have sought treatment for infertility, were not added to the study. All the patients have described the research and written informed consent was taken from all the participants.

A detailed history of all the patients including age, duration of infertility, duration of living together, history regarding male infertility factors, gynecological history, past medical history, past surgical history, and previous infertility treatment was recorded on individual proforma. Sexual history was also taken. All the patients were examined for any apparent signs of vaginal infections. General physical, systemic examination, and pelvic examination were also performed. After history and examination, blood samples of all the patients were sent to the laboratory for Prolactin level on the 21st day of the cycle. Ultrasound of the abdomen and pelvis of all the patients was done for tracking ovulation. Ultrasound helped in the provisional assessment of the patients and look for the need for HSG and diagnostic laparoscopy. Ovulation was assessed by the maintenance of a basal body temperature chart. Hormonal assay and cervical mucus analysis were also done. For the judgment of male-related factors, a post-coital test and semen analysis of the male partners of all the patients was conducted.

After all the non-invasive investigations, invasive investigations of those patients who needed them were done. Laparoscopy, HSG, and hysteroscopy were done for this purpose. The criteria set for diagnostic laparoscopy were that the couples who were unable to conceive for more than 2 years and there was an absence of male factors, ovulation failure, and sexual dysfunction. Laparoscopy was performed in those females who had a regular menstrual cycle. It was done in the premenstrual phase. Tubal patency and assessment of pelvic health were checked in laparoscopy. Methylene blue dye was used to test the patency of fallopian tubes. Diagnostic laparoscopy was also performed in some patients.

Those patients who had a suspicion of any local pathology of endometria such as sub-mucous fibroids and polyps and had a history of irregular bleeding were considered for HSG. It was performed in the same session in which laparoscopy was done. Moreover, those patients who did not have patent fallopian tubes were also selected for HSG to look for intrauterine pathology and site of tubal blockage. SPSS version 22 was used for data analysis.

Result

A total of 186 participants were included in the study who were unable to conceive. During the given duration of time, 2657 patients visited OPD for multiple issues. Those who had been diagnosed with infertility were 7%. Factors responsible for infertility are given in table 1.

Diagnostic laparoscopy was done in 42 (22.58%) patients. HSG was done in 30 (16.12%) patients including those in which tubal blockage was confirmed. As many as 48 (25.80) patients did not have

any pelvic pathology. A total of 39 (20.96%) couples were detected with male-related factors behind infertility. Semen analysis of those male partners showed different anomalies in sperms such as low sperm count, impaired motility, dysfunctional sperms, and impaired morphology.

The most common anomaly seen in females was ovulatory failure mostly due to PCOS. Ovulatory failure was observed in 43 (23.11%) patients. The second most common issue was Tubal blockage. The tubal blockage was found in 28 (15.08%) patients. Endometriosis was detected in 13 (6.98%) patient, 10 (5.37%) patients had sexual dysfunction, 3 (1.61%) had mucus hostility, and 2 (1.07%) were detected with Tubo-Ovarian masses.

Table 1. Factors responsible for infertility in the participants of the study (n=186)

| Causes | Number of Cases | Percentage |
|----------------------------------|-----------------|------------|
| Normal Pelvis | 48 | 25.8% |
| Male partner-related infertility | 39 | 20.96% |
| Ovulatory failure | 43 | 23.11% |
| Tubal Blockage | 28 | 15.08% |
| Endometriosis | 13 | 6.98% |
| Sexual dysfunction | 10 | 5.37% |
| Mucus hostility | 3 | 1.61% |
| Tubo-Ovarian masses | 2 | 1.07% |

Discussion

In the present modern age, there are several techniques that help infertile couples to conceive. The assisted reproductive technique (ART) is one of them. According to the study of Ceballo et al, it was seen that more African American women were at risk of infertility. Infertility interventions similar to ART can help those women of low socio-economic class in conception [8]. According to the study of Qadir et al, psychological stress is a very strong reason behind infertility in females. The study included 177 participants with primary infertility. Psychological distress was noticed in 37.3% of the subjects. They concluded that psychological and social support can help in this regard [9]. A total of 25.8% of participants in our studies had normal pelvis. No pathological reason could be identified in those subjects. It is possible that those participants had psychological distress. This distress is mostly due to family and social pressure.

A similar study was conducted by Sami et al. in which they studied the prevalence of infertility in Pakistan. They identified that primary infertility was present in 4% of participants and secondary infertility was present in 18% of the participants. They also observed that the knowledge of Pakistani women regarding the scientific causes of infertility is limited which results in their inclination of them towards traditional health care methods. They concluded that the women of Pakistan are in a dire need of health education and awareness [10]. Mumtaz et al concluded in their study that the main cause of secondary infertility in Pakistan is sexually transmitted infections and previous surgical procedures [11].

Conclusion

Infertility is a common issue in the population under study. Female infertility was more common than male infertility. Ovulatory failure was the most common cause of female infertility. Proper diagnosis and management of the root factor can potentially treat infertility and can help in conception.

Conflict of interest:

None

Funding source

None

Permission

Permission was taken from the ethical review committee of the institute

Reference:

1. Patel AS, Leong JY, Ramasamy R. Prediction of male infertility by the World Health Organization laboratory manual for assessment of semen analysis: a systematic review. *Arab journal of urology*. 2018 Mar 1; 16(1):96-102.
2. Warner L, Jamieson DJ, Barfield WD. CDC releases a national public health action plan for the detection, prevention, and management of infertility. *Journal of Women's Health*. 2015; 24(7):548-9.
3. Infertility | Reproductive Health | CDC [Internet]. Cdc.gov. 2021 [cited 13 April 2021]. Available from: [https://www.cdc.gov/reproductivehealth/infertility/index.htm#:~:text=About%206%25%20of%20married%20women,to%20term%20\(impaired%20fecundity\).](https://www.cdc.gov/reproductivehealth/infertility/index.htm#:~:text=About%206%25%20of%20married%20women,to%20term%20(impaired%20fecundity).)
4. Durairajanayagam D. Lifestyle causes of male infertility. *Arab journal of urology*. 2018; 16(1):10-20.
5. Bala R, Singh V, Rajender S, Singh K. Environment, lifestyle, and female infertility. *Reproductive Sciences*. 2021; 28(3):617-38.
6. Yatsenko SA, Rajkovic A. Genetics of human female infertility. *Biology of reproduction*. 2019; 101(3):549-66.
7. Rangel EL, Castillo-Angeles M, Easter SR, Atkinson RB, Gosain A, Hu YY, Cooper Z, Dey T, Kim E. Incidence of infertility and pregnancy complications in US female surgeons. *JAMA surgery*. 2021; 156(10):905-15.
8. Ceballo R, Abbey A, Schooler D. Perceptions of women's infertility: what do physicians see? *Fertility and sterility*. 2010; 93(4):1066-73.
9. Qadir F, Khalid A, Medhin G. Social support, marital adjustment, and psychological distress among women with primary infertility in Pakistan. *Women & health*. 2015; 55(4):432-46.
10. Sami N, Saeed Ali T. Perceptions and experiences of women in Karachi, Pakistan regarding secondary infertility: results from a community-based qualitative study. *Obstetrics and gynecology international*. 2012 Jan 1; 2012.
11. Mumtaz Z, Shahid U, Levay A. Understanding the impact of gendered roles on the experiences of infertility amongst men and women in Punjab. *Reproductive health*. 2013; 10(1):1-0.