

Original Research Article

Prospective evaluation of causes of infertility at a tertiary care hospital

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ABSTRACT

Background: Infertility is defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Worldwide, its prevalence is approximately 8-12%. There are numerous factors such as anatomical, physiological, genetic, environmental and acquired factors that cause infertility. The aim of the present study was to determine the causes and clinical pattern of infertility in infertile couples in North West India.

Methods: It was a hospital based observational study carried out on 211 infertile couples in reproductive age group attending infertility clinic of Sardar Patel Medical College and associated PBM Hospital, Bikaner, Rajasthan between September 2016-February 2017. Collection of data was performed by means of a specifically designed questionnaire, which apart from the demographic data also included questions concerning the causes of infertility. Cases of infertility diagnosed after detailed history, clinical examinations and laboratory tests were included.

Results: Out of 211 infertile couples, female factor was predominant in 60.18%, male factor in 15.16%, unexplained in 15.16% while a combination of both factors was seen in 9.47% cases in our study. 33.17% women had ovulatory dysfunction diagnosed by menstrual history and ultrasonography. Tubal block was observed in 9.47% infertile women. 6.63% women had hypothyroidism and 1.89% infertile women were diagnosed to have endometriosis. Husband semen analysis was also done to assess male factor. Nearly 5.21% of their male partners suffered from oligospermia, 4.73% had azoospermia and oligoasthenospermia was observed in 3.79% male partners.

Conclusions: Predominant cause of infertility can be reported in male or female partner or both so, either partner should be counselled and investigated properly. Our study reports a predominance of female factors as a cause of female infertility but male factors also accounted for a significant number of cases.

Keywords: Causes, Female factor, Infertility, Male factor

INTRODUCTION

Infertility is a major health issue affecting about 8-10% couples globally.¹ World Health Organization (WHO) has estimated that 60-80 million couples all over the world currently suffer from infertility.² Diagnostic evaluation of infertility is done when pregnancy has not been achieved within a year of regular noncontraceptive intercourse, by which time 85-90% of couples should have conceived.³ Some biological and social factors like stress, religious

beliefs, late marriages, higher literacy, contraceptive usage, and nuclear families play an important role in fertility.⁴ Anatomical, genetic, hormonal, immunological problems and sexually transmitted infections contribute to infertility.⁵ The etiology of female infertility includes ovulatory dysfunction, tubal factors, uterine anomalies, fibroid, Asherman syndrome, endometriosis etc. The etiology of infertility in males is less understood, though the causes of infertility include anatomical abnormality, ejaculatory dysfunction, endocrinopathies, chemotherapy,

radiotherapy, immunologic problems, gene mutation and environmental exposure to toxins.⁶

There is paucity of data and information about the prevalence and causes of infertility among infertile women of reproductive age group in Rajasthan. Hence a study was conducted to assess causes and clinical pattern of infertility among women visiting a tertiary care centre in Bikaner, Rajasthan.

METHODS

It was an observational prospective study carried out among the women attending infertility clinic of tertiary care hospital, Bikaner between September 2016 and February 2017 after satisfying the inclusion criteria and obtaining their verbal consent.

Inclusion criteria

The study included infertile couples in whom pregnancy has not been achieved in a year of regular intercourse, diagnosed by the gynaecologist after full examinations and laboratory tests.

Exclusion criteria

Surrogate women, postmenopausal women, non-adherence of treatment, and unmarried women seeking child, lack of full examinations, laboratory tests and suffering from any neurological or psychiatric illness.

A case information proforma was developed to gather relevant information of the eligible couples like demographic characteristics, menstrual history, history of galactorrhoea, weight gain, vaginal discharge and sexual activity. Thorough clinical examination of all the eligible couples was done. Genital examination was done to rule out cervical stenosis, endometriosis and to observe nature of cervical mucus.

Blood samples of infertile women were collected for the hormonal study such as thyroid profile, prolactin, day 2 FSH and LH as indicated. Tubal and uterine pathology were evaluated by ultrasonography, hysterosalpingography, laparoscopy and hysteroscopy. For men, the information related to puberty, cryptorchidism inguinal hernia, testicular inflammation, and sexually transmitted diseases have been documented through questionnaire.

Physical examination of testes was done to rule out varicocele or other lesions. Seminal fluids analysis was done of all male partners of the infertile couple after an abstinence of 2-5 days and analysed according to World Health Organization 2010 guidelines. When the semen analysis found to be abnormal, the male partner was referred to the urologist. All the data collected was compiled and analysed statistically using percentage.

RESULTS

It was observed that 54.97% females were in the age group of 21-25 years followed by 30.33% in 25-30 years age group as shown in Table 1. Majority of the women (75.35%) were from urban area.

Table 1: Sociodemographic profile of infertile females.

Age	Number	Percentage
21-25	116	54.97
26-30	64	30.33
31-35	24	11.37
36-40	5	2.36
>40	2	0.94
Residence		
Rural	52	24.64
Urban	159	75.35

As shown in Table 2, out of the total 211 infertile couples examined and evaluated, 127 (60.18%) diagnosed to have female cause of infertility and 32 (15.16%) had male factor responsible for infertility. 20 infertile couples (9.47%) had both male and female causes. In 32 (15.16%) couples cause of infertility couldn't be explained.

Table 2: Distribution of the couple according to the causes of infertility.

Causes	Number	Percentage
Female	127	60.18
Male	32	15.16
Combined	20	9.47
Unexplained	32	15.16

Table 3: Distribution according to the cause of female infertility.

Causes	Number	Percentage
Ovulatory dysfunction	70	33.17
Tubal block (unilateral/bilateral)	20	9.47
Hypothyroidism	14	6.63
Endometriosis	4	1.89
Premature ovarian failure	2	0.94
Genital tuberculosis	2	0.94
Primary amenorrhoea	3	1.42
Uterine anomaly	3	1.42
Asherman	1	0.47
Ovarian cyst	2	0.94

As shown in Table 3, it was observed that the most common comorbid disease found in infertile female was ovulatory dysfunction in 70 cases (33.17%). It was followed by tubal block in 20 women (9.47%), hypothyroidism in 14 (6.63%), endometriosis (1.89%) and pelvic tuberculosis (0.94%). The other lesser common etiological factors found in infertile women

were primary amenorrhoea (1.42%), premature ovarian failure (0.94%), uterine anomaly (1.42%), Asherman syndrome (0.47%) and ovarian cyst (0.94%). Nearly 0.94% of women with previous history of normal menstrual cycle had high level of FSH i.e. more than 10IU/L indicating premature ovarian failure. Genital tuberculosis was identified in two women (0.94%) as independent cause of female infertility. It manifested as abnormal uterine bleeding and pelvic pain in both of them. It was confirmed by endometrial biopsy and PCR result.

Table 4: Combined female factors causing infertility.

Combined causes	Number	Percentage
Tubal & ovulatory dysfunction	2	0.94
Tubal and asherman	2	0.94
Tubal and thyroid	1	0.47
Tubal, thyroid uterine anomaly	1	0.47

As shown in Table 4, among the infertile women, six women had more than one factor causing infertility. Two had tubal with ovulatory dysfunction (0.94%). Another two had tubal cause with Asherman responsible for infertility (0.94%). Tubal factor combined with thyroid was observed in two women (0.94%) while in one woman uterine anomaly was also seen associated with thyroid and tubal factor as shown in Table 4.

Table 5: Distribution according to the cause of male infertility.

Causes	Number	Percentage
Azoospermia	10	4.73
Oligospermia	11	5.21
Oligoasthenospermia	8	3.79
Necrospermia	1	0.47
Asthenospermia	1	0.47
Varicocele	1	0.47

The findings on the causes of male infertility are shown in Table 5. The comorbid disease found in male infertility was found to be oligospermia in 11 males (5.21%) followed by azoospermia in 10 males (4.73%), oligoasthenospermia in 8 (3.79%), necrospermia, asthenospermia and varicocele in one male each (0.47%).

There were 20 couples in our study who had both male and female factors responsible for infertility (Table 6). Oligospermia and anovulation were found in four infertile couples (1.89%) followed by oligoasthenospermia and tubal block in three of them (1.42%). Three women (1.42%) had genital tuberculosis as cause of infertility combined with abnormal semen analysis. Two of these three women with genital tuberculosis had tubo-ovarian mass diagnosed by TVS and laparoscopy, confirmed by PCR and histopathological examinations. In another woman, genital tuberculosis manifested as abnormal uterine

bleeding and was confirmed by endometrial biopsy. Nine women had ovulatory dysfunction and six had tubal blockage along with abnormal semen analysis in male partners.

Table 6: Distribution according to combined causes of infertility in infertile couples.

Causes	Number	%
Oligospermia with anovulation	4	1.89
Oligoasthenospermia with tubal block	3	1.42
Azoospermia with anovulation	2	0.94
Necrospermia with anovulation	1	0.47
Necrospermia with tubal block	1	0.47
Azoospermia with endometriosis	1	0.47
Azoospermia with tubal block	1	0.47
Oligoasthenospermia with genital tuberculosis	1	0.47
Necrospermia with genital tuberculosis	1	0.47
Azoospermia, genital tuberculosis with anovulation	1	0.47
Oligospermia with haemorrhagic cyst	1	0.47
Oligoasthenospermia with Hypothyroidism, uterine anomaly	1	0.47
Oligoasthenospermia with anovulation	1	0.47
Oligospermia with tubal block	1	0.47

DISCUSSION

Infertility being a multidimensional health issue occurs not only due to the pathology related to the fallopian tubes, the ovaries, and the endometrium, but also as a result of the modern lifestyle, like the higher average age of marriage, higher education, stress, obesity, non-conducive legal framework for assisted reproduction, etc.

Adamson et al, in their study on the prevalence and correlates of primary infertility among young women in Mysore, India, found that the mean age of women with infertility was 25.9±3.12 year similar to our study where maximum number of infertile women was in the young reproductive age group 21-30 years (85.30%).⁷ In this study, the predominance of younger reproductive age group could be related to marriages at younger age in our population. The results are similar to the study by Adamson et al.⁷

Female factor was responsible in 60.18% of the infertile couples, male factor observed in 15.16%, while in 15.16% no cause could be identified and a combination of both male and female factors was seen in 9.47% cases in our study while Chowdhary et al reported female factors in 45.8%, male factor in 25.6%, unexplained in 9.8% and in 18.8% both partner had abnormality.⁸ The study done in Nigeria shows female related causes of infertility in 42.9% and male causes seen in 19.7%. Both partners contributed to infertility in 16.7%, while no definite cause was found in 20.7% of patients.⁹ In Mongolian study, female factor was responsible in 45.8%

of couple, male factor was seen in 25.6% cases and 18.8% of couples both partners were responsible for infertility while 9.8% had unexplained infertility.¹⁰ According to study by Fathi causes of infertility were male factor (45%), oligo-ovulation disorders (37%) and tubal damage (18%). Infertility factors were identified in the woman alone in 30.6% of cases and the man alone in 29.2%. The rate of unexplained infertility was 20.7%.¹¹

In the causes of female infertility ovulation dysfunction, uterine factor, fallopian tubes and cervical factor had the highest prevalence respectively. The causes of male infertility based on their frequency included semen fluid abnormalities, genetic factors, vascular abnormalities, and anti-spermatogenesis factors, respectively.

On analyzing the cause of female factor infertility, it was found that 33.17% women alone and 4.24% of the women in combination with male factors had ovarian pathology diagnosed by USG, 9.47% women has one or both tubes blocked on HSG similar to the result observed by Fethi.¹¹ In a study in Sari, Iran, tubal factor was the second leading cause of infertility in women.¹² Tubal factor infertility was the leading cause followed by subclinical/clinical hypothyroidism (6.63%) and endometriosis in 1.89% cases. Endometriosis is a non cancerous condition and may develop adhesions between fallopian tubes, uterus and ovaries thereby preventing the transfer of the egg to the tube thus causing infertility. The above evidence supports the findings that tubal and peritoneal factors of importance in infertility include endometriosis by study Tomassetti et al.¹³

In the study conducted by Sudha et al, 53.45% ovulation defects and 58.85% tubal block cases are seen more in 1-2 year period of infertility. Hormonal imbalance is an important cause of anovulation.¹⁴ Women with hormonal imbalance will not produce enough follicles to ensure the development of an ovule by Gohill et al.¹⁵ In this study, 1.42% cases of female infertility had uterine anomaly. Although the uterine factor causes recurrent pregnancy loss and preterm delivery but in a study uterine anomalies in fertile women has been reported 2-3%.¹⁶ The same was reported by other studies that congenital abnormalities, such as septate uterus may lead to recurrent miscarriages or the inability to conceive.¹⁷ Together with endometrial involvement, tuberculosis of the Fallopian tubes is the leading cause of infertility in genital tuberculosis (GTB). Prevalence of GTB in infertile population in developing countries is between 5 and 20%, similar result has been found in our study where GTB is observed in 5 women out of 127 infertile female (3.93%).¹⁸

According to World health organization definition asthenospermia is decreased sperm motility less than 50% of total sperm. Varicocele can lead to increase the temperature of testes and cause reflux of toxic metabolites of adrenal vein to the left kidney. In our study the major causes of infertility with male factors were oligospermia, azoospermia, necrospermia

asthenospermia and varicocele. In our study out of 211 infertile couples, 0.47% male had varicocele in contrast to our study Shiraz, Iran, observed that the most common cause of infertility in men attending infertility clinics was varicocele.¹⁹ The prevalence of unexplained infertility in our study was 15.16% which is similar to that reported by Farhi J et al study in which it was reported to be 20.7%.²⁰

CONCLUSION

As male or female partner or both can be responsible for infertility, so either partner should be counselled and investigated properly before proceeding to aggressive infertility treatments. The medical and socio-economic support of infertile women like easier access to medical services, broader social support, and information are important requirements for resolving the problem. There was a paucity of studies related to etiological pattern of infertility in North West India. So, this study has been done to know the cause and clinical pattern of infertility in married infertile couples in Rajasthan. Our study has reported predominance of female factors as a cause of female infertility but male factors also accounted for a significant number of cases. Related to the cultural realities of specific locations of Rajasthan; where infertility is a pervasive and serious concern it should be addressed through health care programs.

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