



ANALYTICAL STUDY OF CAUSES OF INFERTILITY IN COUPLES ATTENDING TERTIARY CARE CENTRE OF RURAL BIHAR

Obstetrics & Gynaecology

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ABSTRACT

Background: Infertility is a life crisis affecting patients from all around the world. It is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Worldwide, its prevalence is approximately 8-12%.

Aim: To determine the causes and clinical pattern of infertility in couples based on clinical and laboratory finding

Methods: It was hospital based observational study carried out in the department of Obstetrics and Gynaecology of Katihar Medical College and Hospital, from Feb 2019 to Jan 2020. 300 women were selected for the study with the diagnosis of infertility and 36 of them were lost to follow up so 264 women were enrolled in the study

Result: Out of 300 women, 264 had all the data and they participated in the study. Maximum women (50%) were in age group 20-29 yrs. The median duration of marriage was 5 yrs. Primary infertility was in 70% women and 30% women presented with secondary infertility. Female factor was found in 48.1% cases, 15.2% cases had only male factor, 28% having both male and female factor whereas 8.7% cases were with unexplained infertility. Features of polycystic ovaries and ovulatory dysfunction were found in 14.4% women. Adnexal pathology was seen in 10% cases, uterine fibroid detected in 10.6% cases and uterine anomalies were found in 1.5% cases. High level of TSH ($TSH \geq 4$) were found in 32 (12.1%) women and 14 women (5.3%) diagnosed with hyperprolactinemia (≥ 25 ng/ml). Approx. 3.4% women were found to have high level of FSH ≥ 10 , whereas LH was raised in 2.3% cases. 14.4% male had abnormal semen parameters. Common abnormalities were azoospermia 6% and oligozoospermia in 3.8% and asthenospermia in 4.5% cases.

Conclusion: Primary infertility cases are more common with female factor predominance over male factor. Ovulatory dysfunction, tubal pathology, hormonal imbalance and abnormal semen parameters were main contributing factor for infertility. Male and female both factors are responsible for infertility. So, both partners should be counselled and investigated properly.

KEYWORDS

Infertility, female factor, male factor, hysterosalpingography, semen analysis

INTRODUCTION

Infertility is a disease of the reproductive system defined by failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.^[1] The World Health Organization (WHO's) epidemiologic definition of infertility increases the time for a chance of getting pregnant to 2 years "women of reproductive age (15-49 yrs.) at risk of becoming pregnant (not pregnant, sexually active, not using contraception, and not lactating) who report trying unsuccessfully for a pregnancy for 2 years or more."^[2] Infertility is a serious health issue worldwide, affecting approximately 8% to 10% couples worldwide.^[3] Of 60-80 million couples suffering from infertility every year worldwide, probably between 15 and 20 million (25%) are in India alone.^[4,5]

According to a report by WHO, 1 in every 4 couples in developing countries is affected by infertility.^[6] Infertility is divided into primary and secondary categories based on the presence or absence of a previous pregnancy.^[7,8] Both male and female factors can lead to infertility.^[9] The difference in statistics of infertility and causes are diverse in different geographical region and are mainly associated with reproductive behaviours and socio cultural factors such as age at marriage, educational status, environmental condition, smoking, and alcohol abuse, changes in lifestyle and diet.^[10] There are various factors such as anatomical, physiological and genetic factor that causes infertility.

Menstrual and ovulation dysfunction and uterine factors are the most common causes of impairment in infertility. A women's ability to get pregnant can also be affected by age of the women which directly affects the ovarian reserve. Hormonal conditions that can affect fertility includes polycystic ovarian syndrome, thyroid problems, hyperprolactinemia, diabetes and premature ovarian failure. Tubal blockage or damaged tube, endometriosis, pelvic adhesions, fibroid uterus are major factors leading to infertility.

Many environmental and acquired factors also influence fertility. Smoking, drinking alcohol and drugs directly affect fertility. Sexually transmitted diseases like chlamydia and gonorrhoea also hamper fertility. Male infertility factors are known to reduce the production of sperms with normal morphology and progressive motility.^[11] There is a paucity of information about the prevalence of primary and secondary infertility among infertile couples of reproductive age group in Bihar. Hence this study was done to assess the causes and clinical pattern of infertility among women visiting a tertiary care centre in Katihar, Bihar.

MATERIALS AND METHODS

After institute ethics committee clearance, this hospital based observational study was conducted over a period of 1 year from February 2019 to January 2020 among all married women between 15-49 yrs. of age attending the outdoor of Obstetrics and Gynaecology department of Katihar Medical College and Hospital. Women who were unmarried, divorced, menopausal and not willing to give consent were excluded from the study.

A total of 4500 patients were seen in the gynaecology outdoor during the study period and approximately 450 women were seen with complain of inability to conceive. The study sample included a total of 300 women with the diagnosis of infertility. Women with complain of inability to conceive, whether it is primary or secondary, were included in this study.

300 women were selected with the diagnosis of infertility and 36 were lost to follow up so 264 women were enrolled in the study. The detail history of the couples were taken and clinical examination of female partner were done. Menstrual history was taken in detail, information regarding changes of puberty, galactorrhoea, sexual desire and frequency were asked. The couple were counselled regarding all the relevant investigations. Blood samples were taken for hormonal assessment including thyroid function test and serum prolactin. Ultrasound was done to rule out any uterine or adnexal pathology initially, and for follicle monitoring to assess ovulation.

Hysterosalpingography (HSG) was done on day 8 to 10th day of the menstrual cycle to see tubal patency and uterine cavity. Diagnostic laparoscopy with chromopertubation was done if any abnormalities were found in HSG. For male partner history was taken regarding alcohol and drug abuse, testicular viral inflammation during puberty, any surgery in pelvic region like inguinal herniorrhaphy and sexually transmitted disease. Semen examination after three days of abstinence were done.

Semen analysis was interpreted according to WHO guidelines and if any abnormalities were found, the male partner were referred to urologist for further assessment. Physical examination of testes in order to rule out varicocele or other lesion and hormonal assessment and ultrasound of tests were done according to the urologist advice.

RESULT

300 women were selected for the study with the diagnosis of infertility

and 36 of them were lost to follow up and so 264 women were enrolled in the study. The incidence in our study is 12.2%.

Table 1. Socio demographic factors

Variables	Number of Cases	Percentage
1.Age(years)		
<20	22	8.4%
20-29	132	50.0%
30-39	87	32.9%
>40	23	8.7%
2. Parity		
0	164	62.0%
1	56	21.0%
2	44	17.0%
3. Duration of marriage (yrs.)		
1-5	128	48.5%
6-10	56	21.2%
11-15	48	18.2%
>15	32	12.1%
4. Type of infertility		
Primary	185	70.0%
Secondary	79	30.0%
5. Type of Factor		
Female factor	127	48.1%
Male factor	40	15.2%
Both male and female factor	74	28.0%
Unexplained	23	8.7%

*Presents the demographic characteristics of women. Majority of women belong to 20-29 years of age (50%) followed by 30-39 years of age (32.9%), >40 years of age (8.7%) and <20 years of age (8.4%). Of 264 eligible women, primary infertility was found in 185 (70%). Increased incidence of infertility was seen within 5 years of marriage. In this study only female factor deficiency was found in 48.1% cases. 15.2% of cases have only male factor and 28% has both male and female factors, whereas 8.7% cases are with unexplained infertility.

Table 2. Investigations of female: Hormonal parameters

Variables	Number of Cases	Percentage
Hypothyroid (TSH $\geq$ 4)	32	12.1%
Hyperprolactinemia ($\geq$ 25)	14	5.3%
FSH $\geq$ 10	9	3.4%
LH $\geq$ 10	6	2.3%

*High level of TSH (TSH $\geq$ 4) were found in 32 (12.1%) women indicating high proportion of hypothyroidism among the study population. High TSH level typically indicates subclinical or clinical hypothyroidism. 14 women (5.3%) diagnosed with hyperprolactinemia ($\geq$ 25ng/ml). Approx. 3.4% women were found to have high level of FSH $\geq$ 10, whereas LH was raised in 2.3% cases. FSH level more than 10IU/L is an indicator of ovarian resistance.

Table 3. Investigations of female: Female factor

Variables	Number of Cases	Percentage
1. Ultrasonographic findings		
Normal	152	57.6%
Polycystic ovaries & ovulatory dysfunction	38	14.4%
Ovarian cyst	16	6.0%
Endometriosis	10	3.8%
Fibroid	28	10.6%
Endometrial polyp	14	5.3%
Uterine anomaly	4	1.5%
Small uterus	2	0.75%
2. Hysterosalpingography findings		
Bilateral patent tubes	208	78.8%
Single (right/left) tube block	30	11.3%
Bilateral tubal block	21	8.0%
Hydrosalpinx	5	1.9%

*Ultrasonological findings were normal in 152 (57.6%) women, adnexal pathology found in approx. 10% cases, features of polycystic ovaries and ovulatory dysfunction were found in 14.4% women. Uterine fibroid was detected in 28(10.6%) cases. Uterine anomaly including bicornuate uterus, arcuate uterus was found in 4 (1.5%)

women and 2 (0.75%) women presented with small uterus. Endometrial polyp was found in 5.3% women. As far as HSG is concerned, bilateral tubal blockade was seen in 21 (8%) and single tube block were found in 30 (11.4%) women.

Table 4. Investigations of female: Menstrual cycle

Variables	Number of Cases	Percentage
Irregular Menstrual Cycle	2	0.8%
Polymenorrhoea	5	1.9%
Dysmenorrhoea	7	2.7%
Menorrhagia	15	5.7%
Menometrorrhagia	10	3.8%
Hypermenorrhoea	27	10.2%
Oligomenorrhoea	44	16.7%
Regular	154	58.3%

*Out of 264 women, 110 women reported irregular menstrual cycle in which 44 had Oligomenorrhoea.

Table 5. Investigation of male: Male factor

Variables	Number of Cases	Percentage
Semen analysis		
Normal	226	85.6%
Azoospermia	16	6.1%
Oligospermia	10	3.8%
Asthenospermia	12	4.5%

*Semen analysis is the primary investigation performed during male partner work up. 226 (85.6%) male were found with no abnormalities in semen parameter, only 14.4% male had abnormality in semen examination. The common abnormalities were azoospermia (6.1%), oligozoospermia in 3.8% and asthenospermia in 4.5% cases.

DISCUSSION

Infertility is a major public health issue in many countries.^[12] The mean age of women at presentation was 28.3 years. Maximum women 132 (50%) were in age group 20-29 years, similar to a study^[13] in which maximum female infertile cases were in the age group 20- 29 years. The median duration of marriage was 5 years (2-9 years). Similar findings were found in another study.^[14] Mean duration of infertility at presentation was 5 years. The delay in seeking treatment may be due to previous visits to quacks, unawareness of fertility treatment, poverty, poor access to appropriate treatment, prior unsuccessful medical treatment, depression, social stigma. Primary infertility was reported in 185 (70%) women and 79 (30%) women presented with secondary infertility which corresponds with a study done in western population in which primary infertility account for 60- 70% cases.^[15]

In this study, only female factor deficiency was found in 48% cases. 15% cases have only male factor, 28% having both male and female factor, whereas 9% cases are with unexplained infertility. Female factor are commonest factor for infertility in these studies.^[16,17] The predominance of primary infertility (70%) in our study coincides with the previous studies in which primary infertility is seen in almost 61-70% of cases and secondary infertility in 29-33% of patients.^[14,18] Multiple etiological factors have been identified in female partner in this study. In tubal factor pathology bilateral tubal blockade seen in 21 (8%) and single tube block were found in 30 (11.4%) women. High level of TSH were found in 12.1% women and 5.3% diagnosed with hyperprolactinemia. Approx. 3.4% women were found to have high level of FSH $\geq$ 10, whereas LH was raised in 2.3% cases. FSH level more than 10IU/L is an indicator of ovarian resistance and needed further investigations like antral follicle count and antimullerian hormone level. Women with tubal pathology were suggested with laparoscopic evaluation. These parameters were not included in this study.

In this study only 14.3% male had abnormality in semen examination. The common abnormalities were azoospermia (6%) and oligozoospermia in 3.8% cases and asthenospermia in 4.5% cases. This result is similar to various studies in which azoospermia and oligozoospermia were common semen abnormalities.^[19,20] In this study female factor is mainly responsible for infertility with various factors like ovulatory dysfunction, tubal pathology, uterine factor and hormonal disturbances.

CONCLUSION

Infertility is a major health issue affecting couple and need workout for

both partners. Primary infertility was more common with predominance of female factor deficiency in this study. Ovulatory dysfunction is the main cause and tubal pathology, hormonal imbalance and abnormal semen parameters were other contributing factors. Although both male and female factor are responsible, so counselling of both partners is necessary for a proper evaluation and to plan treatment according to the deficient factor. Simple treatment protocol should be followed before the aggressive infertility treatment like invitro fertilization.

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