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Original Research Article

Analysis of causes and clinical pattern of infertility in couples coming to a tertiary care centre in Bihar, India

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ABSTRACT

Background: Infertility is one of the major health problems and a socially destabilizing condition for couples often causing marital disharmony. 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 and genetic factors that cause infertility. Many environmental and acquired factors also lead to inability to conceive. Objective of the present study was to determine the causes and clinical pattern of infertility in infertile couples.

Methods: It was a hospital based observational study carried out on 750 women in reproductive age group attending out-patient clinic of Reproductive Biology Department of Indira Gandhi Institute of Medical Sciences (IGIMS) at Patna during April 2013 to March 2017. All the cases of primary and secondary infertility diagnosed after full examinations and laboratory tests were included and cases lacking of full examinations and laboratory tests were excluded. All the data of infertile couples were recorded in a semi-structured Case Information Performa.

Results: Out of 750 women 454 women had all the data and they participated in the study Nearly 68% women had primary infertility and rest had secondary infertility. Male factor was responsible in 37.39%, female factor in 20.48%, unexplained in 22.46% while a combination of both factor was seen in 8.37% cases in our study .135 women had irregular menstrual cycles in which 64(47%) had oligomenohhrea. 79% women had normal ultrasonography and nearly 11% of women had evidence of PCOD. 24% women had hypothyroidism (TSH more than 4.5 IU/L) and 59(13%) were found to have high level of prolactin i.e. >25 ng/ml. Nearly 8% of women had high level of FSH i.e. more than 10 IU/L which is an indicator of ovarian resistance. In nearly 16% women one fallopian tube was found blocked and 8% had both tubes blocked in hysterosalpingography. Husband semen analysis was done to assess male factor. Nearly 14% of their male partners suffered from azoospermia and 23% had at least one abnormal parameter in semen analysis.

Conclusions: Etiological pattern of infertility varies in different parts of World. Male and female factors both are responsible for infertility. So, both the partners should be counselled and investigated properly.

Keywords: Cause, Female factor, Infertility, Male factor, Pattern

INTRODUCTION

Infertility is one of the major health problems and a socially destabilizing condition for couples often causing marital disharmony. Infertility is defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.[1] Worldwide, its prevalence is approximately 8-12%.[2] Infertility affects a relatively large number of couples at some point in their

reproductive lives - globally, between 50 and 80 million couples (WHO, 1994).[3]

The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent.[4] Estimates of infertility vary widely among Indian states from 3.7% in Uttar Pradesh, Himachal Pradesh and Maharashtra, to 5 per cent in Andhra Pradesh, and 15 per cent in Kashmir.[5-7] Moreover, the prevalence of primary infertility has also been shown to vary across tribes and castes within the same region in India.[5,8] However, it should be noted that many of these estimates use different definitions of infertility and consider different time periods, which makes direct comparisons difficult between any studies.

In India, the extent of overall primary and secondary infertility among the women at the end of their reproductive careers (aged 45-49) was reported to be around 8%.[9] However; the rate of infertility has decreased by 7.7% from NFHS-2 to NFHS-3 in India. It is around 2% in NFHS-2 and around 1.85% in NFHS-3.[10] A study conducted among the women in age group 15 -30 years in Mysore reported 12.6 per cent (95% Confidence Interval (CI): 10.5-15.0%) prevalence of primary infertility.[11]

The extent and cause of infertility depends on various socio-cultural factors that directly or indirectly influence sexual practices and behaviours leading to infertility. Various factors like age at marriage, place of residence, social class and educational status of women could be some of the factors of infertility among women in India. Also, there are numerous factors such as anatomical, physiological and genetic factors that cause infertility. Many environmental and acquired factors also lead to inability to conceive. The exact incidence of infertility is difficult to estimate as many eligible couples, especially living in rural and remote areas, do not seek help or consult specialized health care providers in India.

There is paucity of information about the prevalence of primary and secondary infertility among infertile women of reproductive age group in Bihar. Hence a study was planned to assess causes and clinical pattern of infertility among women visiting a tertiary care centre in Patna, Bihar.

METHODS

It was a hospital based observational study carried out among the women attending out-patient clinic of Reproductive Biology Department of Indira Gandhi Institute of Medical Sciences (IGIMS) at Patna during April 2013 to March 2017.

A total of 750 women in reproductive age group, who attended the clinic for consultation, were included satisfying the inclusion criteria and after obtaining their verbal consent.

Inclusion criteria

All the cases of primary and secondary infertility diagnosed by the gynaecologist after full examinations and laboratory tests.

Exclusion criteria

Lack of full examinations and laboratory tests.

Data collection

A semi-structured Case Information Proforma was developed to capture all relevant information of the eligible couples. Demographic characteristics such as current age, age at the time of marriage, menstrual history, and history of galactorrhoea, sexual desire and sexual activity were obtained through face-to-face interview by the attending physician. The subjects were also clinically examined. Biological specimens of all female patients were collected for the hormonal evaluation such as TSH, T4, T3, Prolactin, Day 2 FSH and LH. These tests were done by chemiluminescent immunoassay method on Access 2 using reagents and calibrators from Backman Coulter and quality control material from Bio-rad Company. Ultrasonography of pelvic organs and hysterosalpingography were performed routinely for tubal evaluation. 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.

Statistical analysis

All data from the case information sheet were transferred to the computer using MS Excel sheet (MS Office 7). All statistical analyses were performed using statistical software Stata version 7 (Stata Corp, Texas, and USA).

RESULTS

A total of 454 women out of 750 participated and gave consent for sharing all relevant information. Records with missing variables were not considered for the analysis.

Table 1: Demographic characteristics of women.

Variables	N=454 (%)
Age (years)	
< 20	22 (4.85)
21 – 30	312 (68.72)
31 – 40	106 (23.35)
>40	14 (3.08)
Duration of marriage (years)	
< 2	73 (16.08)
2-7	230 (50.66)
8-12	95 (20.93)
13-17	29 (6.39)
>17	27 (5.95)

Table 1 presents the demographic characteristics of women. Maximum women (68.7%) were in age group 21-30 years, followed by 23.3% in age group 31-40 years. The mean age of women at presentation was 28.24 years (95% CI: 27.7-28.7). The median duration of marriage was 5 years (IQR: 3 to 9 years) in the study population.

Table 2: Clinical characteristics of women.

Variables	N (%)
Parity	
0	306 (67.55)
1	85 (18.76)
2	62 (13.69)
Menstrual history	
Regular	319 (70.26)
Oligomenorrhea	64 (14.10)
Hypermonorrhoea	37 (8.15)
Menometrorrhagia	6 (1.32)
Irregular Menstrual cucle	3 (0.66)
Menorrhagia	15 (3.30)
Dysmenorrhoea	5 (1.10)
Polymenorrhoea	5 (1.10)
Ultrasonography	
Normal	361 (79.52)
PCOD	50 (11.01)
Fibroid	14 (3.08)
Endometriosis	4 (0.88)
Endometriosis + Fibroid	2 (0.44)
Ovarian Cyst	10 (2.20)
Hydrosalpinx	4 (0.88
Anatomical defect	4 (0.88)
Small Uterus	2 (0.44)
Endometrial Polyp	3 (0.66)
HSG	
Both Tubes Normal	347 (75.95)
One Tube Blocked	72 (15.81)
Both Tubes Blocked	35 (8.25)
LH Category	
≤ 10	408 (90.04)
>10	45 (9.96)
FSH Category	
≤ 10	416 (91.63)
>10	38 (8.37)
TSH Category	
≤ 4.5	344 (76.1)
>4.5	108 (23.9)
Prolactin	
≤ 25	402 (88.9)
>25	50 (11.1)
HSA	
All Parameter Normal	283 (62.61)
Any one parameter abnormal	104 (23.01)
Azoospermia	65 (14.38)

Table 2 presents the clinical characteristics of women. Nearly 68% women had primary infertility and rest had secondary infertility. Out of 454 women, 135 women reported irregular menstrual cycles in which 64(47%) had oligomenorrhoea. In 79% women, pelvic ultrasonography was normal and nearly 11% of women had features of PCOD.

As far as HSG is concerned, nearly 16% women were found to have one tube blocked and 8% had both tube blocked. Nearly 10% of the women in study were found to have high level of LH i.e. more than 10 IU/L. Nearly 8% of women had high level of FSH i.e. more than 10 IU/L which is an indicator of ovarian resistance.

Out of 454 women, 109 (24%) women had high level of TSH i.e. more than 4.5 IU/L indicating high proportion of hypothyroidism among the study population. High TSH level typically indicates subclinical or clinical hypothyroidism. Out of 454 women tested for prolactin level, 59(13%) were found to have high level of prolactin i.e. > 25 ng/ml. The husband semen analysis (HSA) was found to be abnormal with at least one parameter in 23% of husbands of studied subjects. Nearly 14% of their male partners suffered from azoospermia.

DISCUSSION

Inability to produce a child is a social stigma in North-eastern part of India and it may lead to broken marriage, marital disharmony, and second marriage but very rarely to child adoption. The mean age of women at presentation was 28.24 years (95% CI: 27.7-28.8 years).

The median duration of infertility at presentation was 5 years (IQR: 3-9 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.

Nearly 72% of couple reported to hospital for treatment between 2-7 years of marriage. Presentation after five years of marriage was seen in 53% of patients in study of Nigerian population.[12] The predominance of primary infertility (67.55%) in our study agrees with the pervious study of most western societies where primary infertility is seen in almost (61-70%) of cases and secondary infertility in 29-33% of patients.[13,14]

Present study is in contrast with Panti AA et al study done in Nigeria where a total of 1,264 new gynecological cases were seen during the study period, and 198 infertile patients were evaluated. The prevalence of infertility was 15.7%. Primary infertility constituted 32.8%, while secondary infertility was 67.2 %.[12]

Male factor was responsible in 37.39%, female factor in 20.48%, unexplained in 22.46% while a combination of both factor was seen in 8.37% cases in our study while in study conducted by Chowdhary MA et al female accounted for 45.8%, male factor in 25.6%, unexplained

in 9.8% and in 18.8% both partner had abnormality.[15] The study done in Nigeria shows Female gender-related causes of infertility accounted for 42.9%; male causes accounted for 19.7%.[12] Both partners contributed to infertility in 16.7%, while no cause was found in 20.7% of patients.

On analyzing the cause of female factor infertility, it was found that 20.48% women had uterine, ovarian or tubal pathology diagnosed by USG, 24.05% women has one or both tubes blocked on HSG, 8.37% women showed poor ovarian reserve. Tubal factor infertility was the leading cause followed by subclinical/clinical hypothyroidism (23.9%).

In Mongolian study, tubal factor infertility was seen in 32.8% of women Female factor was responsible in 45.8% of couple, male factor was seen in 25.6% of case and in 18.8% of couples both partners had demonstrable couple of infertility while 9.8%.has unexplained infertility.[16]

According to study by Fathi et al primary infertility accounted for 65% of cases.[17] 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%. Two combined infertility factors were found in 18% of patients, and three combined factors in 0.5%. The rate of unexplained infertility (which probably includes non-tubal endometriosis) was 20.7%.

In a study conducted by Masoumi et al in Iran, the prevalence of primary and secondary infertility was 69.5% and 30.5% respectively.[18]

Among the various causes of infertility women factors (88.6%) had the highest regard. In the causes of female infertility, menstrual disorders, diseases (obesity, thyroid diseases, and diabetes), 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.

CONCLUSION

Etiological pattern of infertility varies in different parts of World. Male and female factors both are responsible for infertility. So, both the partners should be counselled and investigated properly before proceeding to aggressive infertility treatments. There was a paucity of studies related to etiological pattern of infertility. So, this study has been done to know the cause and clinical pattern of infertility in married couples in Bihar.

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