Determinants of infertility in couples attending maternity hospital

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Abstract

Background: Infertility is defined as not being able to conceive after one year or longer period of regular unprotected sex. Infertility is an experience that not only strikes at the very core of a couple's life but also the whole family and society. **Objectives:** This study was aimed to establish the various determinants inclusive of diverse male and female factors that are responsible in causing primary or secondary infertility.
Methods: A descriptive cross-sectional study was conducted after ethical approval among 448 couples attending infertility clinic in a Tertiary Care Maternity Hospital from 16th July 2018 to 15th July 2019. Convenient sampling was done. All infertile couples who visited hospital's infertility clinic during the study period were included in the study. Clinicodemographic and diagnostics details were recorded and analysed using SPSS 20.
Results: Majority of the couples had primary infertility (326, 74.4%). Mean age of the females was 28.08 ± 5.23 years and males was 31 ± 5.7 years. Most of the infertile couples had unexplained infertility followed by female and male factor. Most common female contributing factors was tubal factor (45, 35.16%), followed by ovarian factor (41, 32.2%). Only 104 (23.6%) of the semen analysis had abnormal result among which most common findings was asthenozoospermia.
Conclusion: Primary infertility is more common than secondary infertility. Tubal factor was the most common female contributory factor while asthenozoospermia was predominantly seen among male partners with abnormal semen analysis.

Key words: Female factors; Infertility; Male factors.

INTRODUCTION

Infertility is the inability of a couple to achieve pregnancy within 12 months of regular unprotected intercourse.[1] In exception to the female partner who is more than 35 years, the definition of infertility is considered after the inability to conceive following six months of unprotected intercourse.[2] Infertility is the common condition that effects the couples both mentally and socially and it is said to affect about 10-15% of the couples who are trying to conceive.[3]

Factors from either or both the partners may contribute in failure in conception. The relative prevalence of the different causes of infertility varies widely among patient populations.[4] The causes of infertility may be attributable to the female in 40% of cases, to the male in 40% of case and to a combination of both male and female factors in 10% of cases. However, it cannot be determined in up to 10-20% of couples.[2]

The aim of this study was to help establish the various determinants inclusive of diverse male and female factors

that are responsible in causing primary or secondary infertility in couples attending Paropakar Maternity and Women's Hospital.

METHODOLOGY

This is a descriptive cross-sectional study done for the duration of one year from 16th July 2018 to 15th July 2019 at Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu, Nepal. All the couples who were unable to conceive within 12 months of regular unprotected intercourse were included in this study. Sample size calculation was done by using the formula: n = z^2pq/d^2, where n = required sample size; z = 1.96 taken at 95% of confidence interval; p = incidence of primary infertility, 74.7% = 0.74[5]; q = 1-p (1-0.747) = 0.253; d, 5% (Maximum tolerable error) = 0.05. Using the formula mentioned above, the minimum sample size should be, n = 290.41 ≈ 291. Convenient sampling was done and all the couples attending infertility clinic during the study period was included in the study. Ethical clearance was taken from Institution Review Board of Paropakar Maternity and Women's Hospital (Ref. 57-11ka-1564).

Detailed information regarding the couple's age, medical history including endocrine disorder and surgical history, time duration of unprotected intercourse, type of infertility (primary or secondary) and investigations of both female and male partners, which included ultrasonography, hysterosalpingography, saline sonography, thyroid function test for female, and semen analysis for male partner were extracted from patients record file. The findings of investigation were recorded in the proforma. Semen analysis report was categorised into normal, oligozoospermia, azoospermia, asthenozoospermia, teratozoospermia, oligoasthanoteratozoopermia and aspermia.

The collected data were then entered in IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). Mean and standard deviation were calculated along with the frequency and percentage to analyse various determinants of infertility.

RESULTS

During the study period total 438 couples visited in infertility clinic among whom 326 had primary infertility (74.4%) while 112 (25.6%) had secondary infertility, among whom 58 (52.2%) had previous abortions, 41 (36.9%) had previous term delivery and 15 (13.5%) had full term pregnancy as well as abortions. Only 16 (14.2%) of the secondary subfertility had previous Caesarean section, while 26 (23.4%) had induced abortion, and 8 (7%) had history of ectopic pregnancy. The mean period

of infertility was 3.84 ± 3.38 years. Mean age of the female was 28.08 ± 5.23 years. Mean age of male was 31 ± 5.7 years. Only 22 (5%) female candidates had endocrine disorders, commonly thyroid disorder in 21 (4.8%) and diabetes mellitus in one (0.2%). Similarly, 22 (5%) of the male candidates had diabetes mellitus and 13 (3%) had hypertension while only four (1%) thyroid disorder.

Only 14 (3.1%) of the female respondents had history of pelvic surgery, among which history of Caesarean section was found in in nine (2%), laparotomy for ectopic pregnancy in four (0.9), for ovarian cysts in one (0.2%) and recanalisation in one (0.2%) female respondents. While 13 of them had surgical abortion in the past. Regarding the body mass index 105 (24%) were underweight, 65 (15%) were overweight, and 13 (3%) were obese.

In both primary and secondary infertile couples, majority had unexplained cause of infertility, that is 212 (48.4%) in primary and 238 (54.4%) in secondary infertility, followed by female factors which was 112 (25.7%) in primary and 120 (27.6%) in secondary infertility, male factors in 97 (22.3%) of primary and 70 (16%) of secondary infertility while both male and female factors were responsible for 11 (3.3%) of primary and 7 (1.7%) of secondary infertility (Table 1).

Most of the female partners 422 (96.4%) were housewife, nine (2%) worked in a private firm, six (1.52%) were farmers and one (0.14%) were teachers while among the male partners, 388 (88.6%) worked in a private firm, 29 (6.7%) worked in overseas, and 21 (4.7 %) were farmers.

Among 438 male respondents, 334 (76.2%) had normal and 104 (23.6%) had abnormal semen analysis. The most common findings of abnormal semen analysis were asthenozoospermia (44, 42.31%), followed by azoospermia (25, 24.04%), oligozoospermia (14, 13.46%), oligoasthanozoospermia (12, 11.54%), teratozoospermia (7, 6.7%) and oligoasthenoteratozoospermia, and aspermia (Table 2).

Among the female factors contributing to infertility, tubal factor was most common (45, 35.16%) among which 25 (59.6%) had bilateral tubal block, and 20 (48%) had unilateral tubal block. Tubal factor was followed by ovarian factor (41, 32.03%) among which majority comprised polycystic ovaries, endocrine factor (18, 14.06%) comprising mostly of thyroid disorder and uterine factors (10, 7.81%), majority of which were due to fibroid uterus (8, 75%), while multiple factors was found in 14 (10.94%) (Table 3).

Table 1: Contributing factors of primary and secondary infertility, n (%)

Contributing factors	Primary infertility (N = 326)	Secondary infertility (N = 112)
Unexplained	158 (48.4)	61 (54.4)
Female factor only	84 (25.7)	31 (27.6)
Male factor only	73 (22.3)	18 (16)
Both male and female factors	11 (3.3)	2 (1.7)

Table 2: Semen analysis, n(%)

Semen analysis	n (%)
Azoospermia	25 (24.04)
Oligo-zoospermia	14 (13.4)
Astheno-zoospermia	44 (42.3)
Terato-zoospermia	7 (6.7)
Aspermia	1 (0.96)
Oligoastheno-zoospermia	12 (11.5)
Oligoastheno-terato-zoospermia	1 (0.96)

Table 3: Female contributory factors

Female factors	n (%)
Ovarian	41 (32.03)
Tubal	45 (35.16)
Uterine	10 (7.81)
Endocrine	18 (14.06)
Multiple	14 (10.94)

DISCUSSION

Infertility can be primary or secondary depending upon whether woman has ever been pregnant before. Two-thirds of the patients attending clinic had primary infertility. Similar findings were reported in the study done in eastern part of Nepal having same population demography as in this study[5] which have reported 74.7% patients having primary subfertility. These findings in Nepali population coincides with the studies done in other parts of Asia[6,7] while a systematic review in Africa showed equal incidence of primary and secondary infertility.[8]

This study observed that most of the males and females coming for infertility treatment were 26 years to 30 years of age which is similar to another study in Nepal in which the mean age of female attending infertility clinic was 26.85 years and that of male was 29.81 years.[5] In a study conducted in European population also, it was observed that women aged 19 years to 26 years had significantly higher probabilities of pregnancy than women aged 27 years to 29 years.[9] It is widely accepted that the infertility problems grow more with increasing age, with peak rate of conception occurring at the age of 24 years for both men and women and declines considerably after the age of 35 years.[10]

Up to 30% of couple who are unable to conceive are determined to have unexplained infertility. Traditionally, this diagnosis was made only after the basic infertility evaluation fails to reveal an obvious obnormality.[11] The current study revealed slightly higher prevalence of unexplained infertility in both primary and secondary infertility (48.4% and 54.4% respectively). The probable cause of this could be due to inability to perform full investigations like laparoscopy and hysteroscopy among the women in resource limited setting like ours.

Among the women attending the infertility clinic, tubal factors are the most important abnormality because of their complexity in the management. The current study revealed tubal pathology as the commonest as compared to ovarian (35.16% and 32.03% respectively) which is similar to the previous studies[12,13] and contrary to the finding of another study[14] where ovarian pathology was the leading factor for infertility among Nepali women. This higher rate of tubal pathologies are mainly due to reproductive tract infections. Pelvic inflammatory disease (PID), the most important causative pathology for tubal factors, are very much prevalent in our demography as reported by various studies done in Nepal.[15,16]

The primary investigations done in male in infertility work up is the semen analysis. Among the male respondents, 23.6% had abnormal semen analysis findings which is comparable to the results reported by previous authors.[5,17,18] Asthenozoospermia followed by azoospermia are the predominant cause for male infertility seen in this study, similar to the findings in other study where asthenozoospermia (39.3%) was the most common abnormality followed by azoospermia (28.8%).[19] A systematic review has by concluded that apart from azoospermia and necrospermia, impaired semen parameters like asthenospermia alone cannot be used to predict fertility as these men still have a chance of being fertile.[20] So treatment options have improved their semen functions.

The current study was done in one of the tertiary care maternity centres in Nepal. But the study is limited by its retrospective nature and small sample size, and the authors of this study did not look into the depth of the causes of infertility. Going into the depth of cause and the study of the risk and contributory factors would help us to get into the details in the management of the infertility in infertile couples.

CONCLUSION

Most common cause of both primary and secondary infertility was due to unexplained factors. Occurrence of infertility was maximum during late twenties in female and early thirties in male. Major cause for infertility in female was of tubal pathology whereas abnormal sperm quality was present in males. Further study should be done in cases of unexplained infertility to identify the real cause of infertility prevailing amongst the couples of reproductive age group.

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