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Determinants of Infertility in Couples

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ABSTRACT

Background: Infertility is defined as a couple's inability to conceive after a period of twelve months of regular unprotected intercourse. Infertility globally affects approximately 10-15% of couples. This study was carried out to find out the determinants of infertility among infertile couples.

Methods: This is a retrospective review of records of 3231 infertile couples in the Department of Obstetrics and Gynecology, Dhulikhel Hospital from January 1, 2008 to June 30, 2018. A total of 3231 infertile couples were evaluated by reviewing their case history including demographic parameters and investigations performed.

Results: Mean age of female cases seeking infertility treatment was 26.85 (±4.78) years and that of male cases was 29.81±3.18 years. About three quarter (74.7%) of the cases was of primary type. Almost half of infertility cases (48.8%) were having only female factor. Of the female contributory factors, half of them (52.12%) had ovulatory cause. Male factors contributed 23.9% of cases and 22.7% cases had abnormality in semen analysis while 1.2% had other sexual dysfunction. Mixed type of infertility was seen in 26.6% and unexplained factors had contribution of 14.4%.

Conclusions: Primary infertility cases are three times more common in Dhulikhel hospital. Ovulatory cause was the most common contributory factors among female infertile cases while abnormality in semen parameter was the commonest problem among male infertile cases. Thorough evaluation and repeated visits were required to find out the apparent determinants of infertility problem.

Keywords: Female factor; hysterosalpingography; infertility; ovulatory dysfunction; semen analysis.

INTRODUCTION

Inability to conceive after a period of twelve months of regular unprotected intercourse,[1] globally affects approximately 10-15% of couples.[2] Parameters such as age, obstetrical history, smoking and drinking habits, menstruation, body mass index (BMI), lifestyle and environmental factors were considered to be the major risk factors leading to infertility.[3] Factors from either or both partners may contribute to difficulties in conceiving; therefore, it is important to consider all possible diagnoses before pursuing invasive treatments.

Infertility services are being regularly provided in Dhulikhel Hospital (DH) since early years of its establishment. There are limited publications related to experiences of infertility services available from Nepal. And, these studies were focused either in the limited causal factors or with small sample size.[4-10]

This study was undertaken to review certain determinants of infertility in couples seeking treatment in Dhulikhel Hospital in last one decade.

METHODS

This was a retrospective study of infertility couples seeking treatment in DH from January 1, 2008 to June 30, 2018. This study was carried out in Department of Obstetrics and Gynecology reviewing all the outpatient department (OPD)/inpatient, Radiology Department and Operation Theater (OT) records (including electronic). All the files and computer recordings were reviewed for this purpose.

All the couples seeking infertility treatment in Dhulikhel Hospital were included in the study. In DH, primary infertility was defined as the couples who had not become pregnant after at least one year having sex

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without using birth control methods while secondary infertility was defined as the couples who had been able to get pregnant (even chemical pregnancy) at least once, but now were unable. We had included the cases accordingly in the study.

All data were entered in excel and analysis was done using SPSS 16. Frequency and mean were calculated. Chi-square test was used to analyze certain outcomes. P value less than 0.05 was considered significant. Ethical clearance was taken from the hospital research committee (IRC-KUSMS # 131/18).

RESULTS

A total of 3231 infertility couples came for infertility treatment in Dhulikhel Hospital in last one decade. Mean age of infertile cases was 26.85±4.78 years for female with highest cases were of age group of 25-29 years followed by 20-24 years. (Table 1).

Table 1. Age group distribution of female infertile cases (n=3231).

Age group (years)	Frequency	Percent
≤19	91	2.8
20-24	1045	32.3
25-29	1195	37.0
30-34	647	20.0
35-39	218	6.7
≥40	35	1.1

About three quarters of infertile cases seeking treatment were of primary infertility 2413 (74.7%) and rest were of secondary infertility 818 (25.3%). There was significant difference between mean age of infertile female cases of primary and secondary type of infertility (Table 2).

Table 2. Comparison between mean age of female infertile cases with respect to type of infertility (n=3231).

Type of infertility	Number	Mean age±SD(range) in years	p value
Primary infertility	2413	26.29±4.7 (16-44)	0.00
Secondary infertility	818	28.51±4.7 (18-45)	

There is noticeable increment of infertile cases from the year 2014 (Figure 1). More than half of the patients were from Kavre district 1916 (59.3%), followed by Kathmandu valley (particularly Bhaktapur) 719 (22.3%), neighbouring districts like Sindhu Palchowk, Dolakha, Ramechhap, Sindhuli 339 (10.5%) and other districts 257 (8.0%).

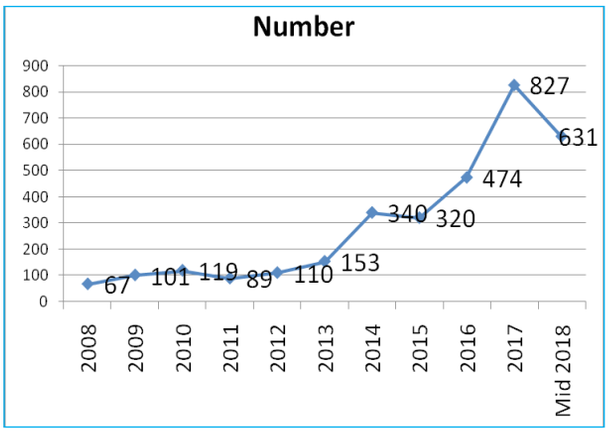

Figure 1. Year-wise distribution of infertile cases seeking hospital care (n=3231).

Out of 3231 infertile cases, more than half were of Janajati cases (57.6%) followed by Brahmin/Chhetri caste (35.8%) (Figure 2). If Janajati and Brahmin/Chhetri were further classified, Newar 1145 (35.4%), Brahmin 605 (18.7%), Chhetri 499 (15.4%), Tamang 469 (14.5%) and Magar 83 (2.6%) were caste distribution.

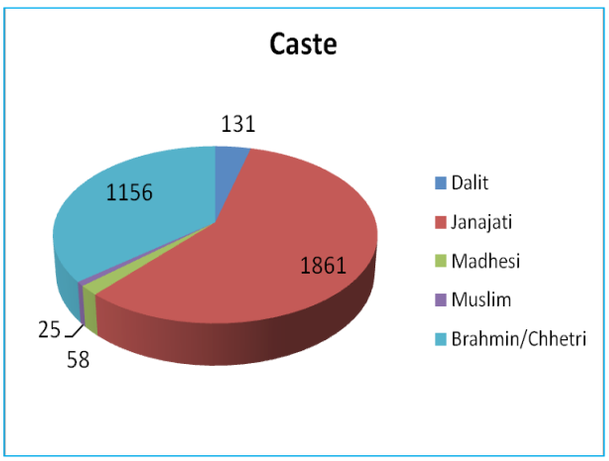

Figure 2. Caste distribution of infertile cases (n=3231).

The mean duration for seeking infertility treatment was 5.55 (±3.96) years. Mean duration of primary infertility was 4.23 (±2.97) years and that of secondary infertility was 4.53 (±2.94) years.

Mean age of male infertile cases was 29.81±3.18 years. Among male partners 27.1% were doing self business, 20% were employee, 14.3% were working abroad and 13.6% were daily worker. Among female partners 85% were house wives. Thirty five percent of infertile female cases have irregular menstrual pattern.

Hypothyroidism was noted in 12.9% cases while hyperthyroidism in 0.7% case. Likewise hyperprolactinemia was observed in 6.9% infertile female cases.

Ultrasonography (USG) was done in most of the infertile female cases who came for infertility services. About 29.3% cases had abnormalities in USG of which 14.1% had adnexal pathology, 7.1% had polycystic ovarian disease (PCOD), 5.7% had uterine fibroid and rest 4.3% had endometrial polyp, bicournate uterus and small uterus.

Three hundred and eighty-one female infertile cases underwent hystero-salpingogrpahy (HSG) and 117 (30.7%) cases had abnormalities in HSG. Out of them, 79 cases had unilateral tubal blockage, 19 cases had bilateral blockage and 19 cases had uterine abnormalities like irregular cavity, bicournate uterus, arcuate uterus and submucosal fibroid.

A total of 1428 hysteroscopy and/or laparoscopy with or without chromotubation were done during this period. There were 111 procedures done for infertility cause and 27 cases had unilateral tubal blockage, 7 cases had bilateral blockage and 6 cases had uterine abnormalities.

In this study, 1578 (48.8%) of infertile couples were having only female factor, 327 (10.1%) having only male factor, 860 (26.6%) having both male and female factor. And 466 (14.4%) of cases were of unexplained type.

In 1578 female infertile cases, 48.8% cases had more than one contributory factor was identified in single infertile women. Of the female contributory factors, half of them (52.12%) had ovulatory cause followed by adnexal pathology (20.3%), tubal pathology (15.53%), thyroid abnormality (13.6%), uterine causes (8.8%), endometriosis (9.7%), hyperprolactinemia (6.89%) and PCOD (5.1%).

There were 775 male infertility cases. The male factor only contributed in 10.1% cases and 13.8% cases had mixed type of infertility; 22.7% cases had abnormality in semen analysis while 1.2% had other sexual dysfunction (premature ejaculation, problem in desire, arousal and orgasm). Most common semen abnormalities were asthenozoospermia followed by oligozoospermia, azoospermia and teratozoospermia in this study.

DISCUSSION

In this study, primary infertility was 74.7% and secondary infertility is 25.3%. This result was similar to the studies that were done in Nepal,[4,5] Saudi Arabia,[11] Iran,[12] Bangladesh,[13,14] Srilanka,[15] Pakistan.[16] But the secondary infertility cases were more in the study that conducted in Eastern Nepal.[9]

The ethnic distribution of the infertile cases of this study is different from that of State 3 (catchment area of Dhulikhel Hospital), except that of Brahmin and Chhetri. The ethnic distribution of State 3 is Tamang 20.42%, Brahmin 18.28%, Chhetri 17.28%, Newar 16.92% and Magar 4.89%.[17]

Mean age of infertile cases was 26.85±4.78 years for female and 29.81±3.18 years for male which was similar in another study.[18] The mean±SD age of the female partner was 29.3±4.9 years.[15] The mean age of female and male in studied couple was 28.2±5.8 and 33.6±6.3 years.[19] And maximum female infertile cases were in the age group of 25-29 years as in other studies.[12,13]

The mean duration of marriage seeking for infertility treatment was 5.55 (±3.96) years, similar findings with 5.39 years found in another study.[11] And mean duration of infertility was 2.92±2.25 years and 4.3±0.5 years respectively.[15,18] But mean duration of infertility in another study was little longer with 7.4±5.2 years.[19]

In this study, 48.8% cases are having only female factor, 10.1% cases having only male factor, 26.6% having both male and female factor while 14.4% cases are with unexplained infertility.

Female factor is commonest factor for infertility In these studies.[13,18,20] The study findings related to male factor are comparable to that of studies by Al-Turki HA[11] and Sultana A et al.[13] And study results related to both and unexplained infertility are similar to the results of studies[13,18] but just opposite to a study by Chowdhury MA.[14]

Multiple etiological factors have been identified in female partner in this study. Hormonal analysis, USG, and minimal invasive procedures like HSG, diagnostic laparoscopy with chromotubation (DLCT) have been used during infertility evaluation.

A few female infertile cases have ovulatory, adnexal, tubal and uterine pathology either in single or in combination as that seen in study by Masoumi SZ.[12] As in this study, ovulatory dysfunction as commonest contributory female factor was seen in the other studies.[12,15]

Tubal factor is seen as the important cause for infertility in this study, accounting 15.53%. This is comparable

to various studies[5,9,12,19] from Iran and Nepal. However, it was main cause for infertility in the studies done in Pakistan[16] and in Bangladesh[18] with 51.5% and 40.2% respectively. This could be due to high prevalence of genital infection and tuberculosis.

In the HSG studies by Shrivastava V R et al[5] and Karki S et al[21] found tubal abnormalities in 34% and 19% respectively. About 30.7% cases are having abnormal HSG finding in this study while it was seen in 83.4% cases in Uganda[22], 63% cases in DH[21], 55% cases done in BPKIHS[4] and 45% cases in Iran.[23] In all these studies, major abnormality is tubal blockage and same abnormality was the causal factor for secondary infertility in the study done by Bhattrai M et al.[10]

Although certain investigations are not regularly performed, thyroid abnormalities were seen in 13.6% cases and hyperprolactinemia in 6.9% cases of infertile female cases. The result of thyroid dysfunction is similar to that of other studies.[7,18,24,25,]

Uterine causes are responsible for 8.8% of cases of female factor. Similar results were seen in other studies.[26,27] Endometriosis is seen in 9.7% of cases of female factor in this study which is similar to that of other studies.[27] In a diagnostic laparoscopy study done in DH showed endometriosis problem in 23.5% of infertile female cases.[28]

Semen analysis is the primary investigation performed regularly during male infertility work up. There are 775 male infertility cases. Male factor contributes in approximately 23.9% cases of this study with only male factor (10.1%) and in mixed type of infertility (13.8%). And 22.7% cases had abnormality in semen analysis while 1.2% had other sexual dysfunction (premature ejaculation, problem in desire, arousal and orgasm). The result of this study is comparable with the results of Pant PR et al.[6] In studies by Anwar BR et al[18] and Sultana A et al[13] revealed 28% and 41.81% cases were male factor respectively.

Most common abnormalities were asthenozoospermia followed by oligozoospermia, azoospermia and teratozoospermia in this study. This result is different than that in various studies.[6,9,14] where oligozoospermia and azoospermia were common semen abnormalities.

Sexual dysfunction (in the form of arousal, desire and orgasm) is regarded as one of the major contributory factor for female infertility.[29] But in this study 1.2% had other sexual dysfunction (sexual discomfort, loss of libido and lack of satisfaction). But the important factors were irregular and infrequent coitus.

Complete records of certain important determinants like body mass index (BMI), hormonal reports (FSH, estrogen level, progesterone level, testosterone level etc), endometrial biopsy findings, detail laparoscopic findings, socioeconomic status and personal habits (smoking, alcohol consumption) could not retrieved. Hence, these variables were not analyzed.

CONCLUSIONS

We have reviewed the various determinants of infertility in infertile couples who came in DH. Primary infertility cases were three times more. The infertile female cases were three years younger to infertile male cases which was compatible with age of their marriage. Most of the infertile cases were of age group 25-29 years and of janajati caste. Ovulatory cause was the most common contributory factors among female infertile cases while abnormality in semen parameter was the commonest problem among male infertile cases. Thorough evaluation and repeated visits were required to find out the apparent determinants of infertility problem.

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