

# Factors Affecting Fertility in Women Visiting Tertiary Care Center of Nepal: A Descriptive Cross-sectional Study

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## Abstract

**Introduction:** Infertility is not merely a health problem; it is also a matter of inequality and social injustice. Though infertility is a medical problem, childlessness is the couple's problem. This study aims to find out the factors affecting fertility in women reporting to the Infertility Centre.

**Methods:** This was cross sectional descriptive study conducted in infertility clinic over the duration of one year. All Women attending the infertility clinic during the study period were included. Information was collected and entered in MS word.

**Results:** There were total of 325 cases visiting the infertility clinic during the study period. The prevalence of female infertility was 9.95%. Primary infertility was present in 229(70.46%) women and 96(29.54%) had secondary infertility. Among hormonal factors, 84(25.85%) had abnormal prolactin levels and 51(15.69%) had abnormal Thyroid stimulating hormone (TSH) level. Among total 37(11.38%) cases with tubal block, 21(56.80%) women had no history of Pelvic inflammatory disease (PID) whereas 65(20%) of infertile women had unexplained infertility.

**Conclusion:** The infertility among our patients visiting was lower than other reported studies. Primary infertility was common. Most of the cases had normal weight, hormonal profile and menstruation cycle.

**Keywords:** Body mass Index; Hormonal Profile; Infertility; Menstruation; Pelvic inflammatory disease.

## Introduction

Infertility 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'.<sup>1</sup> It may be further classified as primary infertility, in which no previous pregnancies have occurred, and secondary infertility, in which a prior pregnancy, although not necessarily a live birth, has occurred.<sup>2</sup>

According to a systematic analysis of national health surveys, in 2010, approximately 10.5% of women around the world experienced secondary infertility, and roughly 2% experienced primary infertility.<sup>3</sup> The consequences of infertility in developing countries range from social stigmatization and blame, economic hardships, violence, social isolation and even denial of proper death rites.<sup>4</sup> Though male and female both may be responsible for infertility, however it appears that the woman is consistently held responsible for a couple's infertility, and she is often

punished psychologically and socially as a consequence.<sup>5</sup>

With this background, this study is designed to know the prevalence of female infertility and examine the factors affecting fertility in female in Tribhuvan University Teaching Hospital (TUTH).

## Methods

The study was conducted after the clearance of Institutional review committee (IRC) of TUTH [357(6-11-E)2/73/74]. This was a cross-sectional descriptive study. It was conducted in the infertility clinic of Department of Obstetrics and Gynaecology, TUTH, Kathmandu for the duration of one year (2017-18). All female cases visiting the Infertility Clinic of TUTH during of the study period were included in the study and cases not giving the consent were excluded. Non probability continuous convenience sampling technique was employed.

Based on previous year's data of infertility clinic, of the 522 new

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cases, the total number of female infertility cases were 374.

Using formula=  $(z^2pq)/d^2$

Where,

$z$ = value of 95% significance level= 1.96;

$p$ = Prevalence =  $(374/522) = 0.716$ ;

$q = (1 - p) = 0.284$ ; and

$d$ = margin of error= 5%= 0.05.

Hence, the sample size was calculated to be 312.

A detailed history, examination and the necessary investigations was done on all the included patients. The patient's demographic profile and details of their routine infertility investigations including hormonal assays like Thyroid Stimulating hormone (TSH), Follicle stimulating hormone (FSH), Luteinizing hormone (LH), Antimüllerian Hormone (AMH), and investigations like hysterosalpingography (HSG), Transvaginal sonography (TVS) were noted and written on proforma. The data was then entered

on MS Excel 2016 and analysis performed on Epi Info v 5.5.16. The variables were described in terms of place and person using proportions and percentages. The analysed data was presented in the form of table.

## Results

A total of 4,621 new cases attended the out-patient department (OPD) of TUTH out of which 460 females had complaints of infertility and visited infertility clinic. Thus incidence of female infertility was found to be 9.95%. Primary infertility was present in 229(70.46%) women and 96(29.54%) had secondary infertility. Majority, 185(56.92%) of the patients attending the Infertility clinic were of the age group 26-35 years. Females with bachelor degree was 89(27.38%), with higher secondary educational status 63(19.38%) and 140(43.08%) had primary level of education. Around 33(10.16%) of participants were illiterate.

**Table 1:** Proportion of various variables with age distribution of study participants (n=325).

Variable	Category	Age in years, N (%)			Total (n=325)
		16-25 (n=110)	26-35 (n=185)	>35 (n=30)	
Menarche	*Early &/ Delayed	38 (34.55)	59 (31.89)	11 (36.67)	108(33.23)
	Normal	72 (65.45)	126 (68.11)	19 (63.33)	217(66.77)
Menstrual cycle	Irregular	31 (28.18)	30 (16.22)	5 (16.67)	66(20.31)
	Regular	61 (55.46)	129 (69.73)	23 (76.67)	213(65.54)
	Amenorrhoea	18 (16.36)	26 (14.05)	2 (6.67)	46(14.15)
BMI	Underweight(<18.5)	11 (10)	15 (8.11)	0 (0)	26(8)
	Normal weight(18.5 –24.9)	72 (65.45)	111 (60)	15 (50)	198(60.92)
	Over weight(>25)	27 (24.55)	59 (31.89)	15 (50)	101(31.08)
TSH	Normal	95 (86.36)	155 (83.78)	24 (80)	274(84.31)
	Abnormal	15 (13.64)	30 (16.22)	6 (20)	51(15.69)
AMH	Normal	46 (41.82)	89 (48.11)	12 (40)	147(45.23)
	Abnormal	64 (58.18)	96 (51.89)	18 (60)	178(54.77)
FSH	Normal	106(96.36)	179 (96.76)	28 (93.33)	309(95.08)
	Above Normal	4 (3.64)	6 (3.24)	2 (6.67)	16(4.92)
Prolactin	Normal	84 (76.36)	131 (70.81)	26 (86.67)	241(74.15)
	Abnormal	26 (23.64)	54 (29.19)	4 (13.33)	84(25.85)
LH	Normal	96 (87.27)	156 (84.32)	28 (93.33)	280(86.15)
	Abnormal	14 (12.73)	29 (15.68)	2 (6.67)	45(13.85)

\*Early menarche: before 11 years; delayed menarche: after 15 years

Table 1 displays proportion of various variables with age distribution of study participants.

It should be noted that above and below normal levels were considered as abnormal values. The abnormal TSH value was present in 51(15.69%) and abnormal prolactin level was present in 54(29.19%) of cases belonging to 26-35 years. Total 36(11%)

cases had both abnormal prolactin and TSH levels.

Among all age groups primary infertility was found to be more common. Cases of primary infertility was present in 89 (80.91%), 126 (68.11%), 14 (46.67) of female belonging to 16-25 years, 26-35 years and >35 years of age distribution. (Table 2)

**Table 2:** Association of age, HSG findings and menarche status with type of infertility.

Variables	Category	Infertility, N(%)	
		Primary (n=229)	Secondary (n=96)
Age in years	16-25 (n=110)	89 (80.91)	21 (19.09)
	26-35 (n=185)	126 (68.11)	59 (31.89)
	>35 (n=30)	14 (46.67)	16 (53.33)
HSG	Normal Spillage (n=288)	207 (71.88)	81 (28.12)
	Tubal Block (n=37)	22 (59.46)	15 (40.54)
Menarche	Early(<12years) (n=10)	8 (80)	2 (20)
	Normal (n=217)	158 (72.81)	59 (27.19)
	Delayed (>16years) (n=98)	63 (64.29)	35 (35.71)

Among total 37(11.38%) cases with tubal block on HSG, 21(56.80%) women had no history of Pelvic inflammatory disease (PID) whereas 16(43.20%) had PID. (Table 2)

## Discussion

In this study, the incidence of female infertility was 9.95%. A study done by R. Ramos et al, found similar incidence of female infertility varying from 10 to 20%.<sup>7</sup> However, it was reported to be 4% in study by Ilorin, 48.1% reported in study by Oshogbo.<sup>8,9</sup> The lower incidence may be due to low health seeking behaviour in Nepalese population. Moreover, cases of infertility are social stigma and couples talking about it and getting treated may be lowering the study population.

In this study, primary infertility was more common in 229(70.46%) cases compared to secondary infertility i.e. 96(29.54%). This was similar to a study done by S. Masoum et al where 69.5% cases suffered from primary infertility and 30.5% suffered from secondary infertility.<sup>2</sup> Whereas in a study done by Larsen et al secondary infertility was comparably higher than primary infertility in contrast to our study.<sup>10</sup> This may be due to the different demographics and sociocultural status of the population in the above mentioned study. Similarly, another study done in eastern Nepal population also report secondary infertility as the most common type.<sup>11</sup> We had large sample size and cases were from different parts of Nepal so this may have caused different result than the one above mentioned. In a study done by Maheshwari A et al, among 7172 women 51.4% had primary infertility and the mean age of infertile female was 31.2 years and the study found an association between female age and the cause of infertility, which was similar to our study.<sup>12</sup>

In the present study, 89(27.38%) female had achieved Bachelor degree. Education may increase the career aspiration and may delay age at marriage, child births hence influencing fertility. This was similar to results of study done by Khariaf et al.<sup>13</sup>

In a cohort study by Wise et al woman's BMI higher than 35 kg/m<sup>2</sup> has been associated with low fertility rates.<sup>14</sup> Similarly meta-analysis by Maheshwari et al found that women with BMI

higher than 25 kg/m<sup>2</sup> had a lower chance of pregnancy.<sup>15</sup> In addition, in women presenting with ovulatory infertility, weight reduction may restore ovulation and conception. Our study also had 31.08% of female with BMI above 25 hence causing the infertility.

Hormonal imbalance is an important cause of anovulation.<sup>16</sup> In a study done by Verma et al, among 394 infertile women visiting the infertility clinic 23.9% had hypothyroidism.<sup>17</sup> In another study done by Nallusamy. S and Gracelyn. L, among 300 infertile females 24.67% had hyperprolactinemia which was almost similar to our study.<sup>17</sup> So identifying and treating hypothyroidism and hyperprolactinemia at an early stage can have potentially great preventive value in screening of all infertile women.

The results showed that the majority of studies women had normal FSH (95.08%) and LH (86.15%) level, this agrees Ali. A et al, which stated that FSH and LH imbalance has a minor suspected etiologic factor in causing infertility.<sup>18</sup>

Another significant factor in this study was Menarche. In a study done by Komura et al, the relationship between the age at menarche and reproductive ability found that a group in whom menstruation started after the age of 18 years had a significantly higher rate of infertility (15.7%) than the others (5%).<sup>19</sup> The age at menarche was associated with primary infertility in our case.

Masoumi et al conducted a study in 2010 to 2011 on the causes of infertility in patients which was quite similar to our study findings. However, in contrast to our study, Sudha et al did a study which found tubal factors infertility in 36.95% cases.<sup>2,20</sup> That study has not described the method of diagnosis for tubal blocks so more cases may have been diagnosed.

## Limitations

This study was a single hospital based study, so the generalisability of the study results may be difficult. The recall bias could not be ruled out.

## Conclusion

The infertility among our patients visiting was lower than other reported studies. Primary infertility was common. Most of the cases had normal weight, hormonal profile and mensuration cycle.

**Conflict of Interest:** None

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