



THE PREVALANCE OF ETIOLOGICAL FACTORS IN FEMALE INFERTILITY PATIENTS

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ABSTRACT

Background: Infertility is defined as the inability to conceive by at least one year of regular unprotected intercourse. The present study is designed to cover all the etiological aspects of infertility and assess the proportion of primary and secondary infertility.

Methodology: Its prospective observational study. Patient population are 100 couple with infertility. Couples were subjected to routine investigations. Statistical analysis was done by using SPSS 20. **Results:** Investigations were normal in 46% of women 33% PCOS, 4% Fibroid uterus, 3% structural defect, 1% presented with adenomyosis, 1% endometrial polyp, 8% tubal block and 2% with PID.

Conclusion: Major factor of female infertility were found to be leading cause in our study. They were ovarian factor, tubal factor, uterine factor and cervical factor. Their contribution in our study towards female infertility 35%, 8%, 9%, 1% respectively.

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INTRODUCTION

Infertility is defined as the inability to conceive by at least one year of regular unprotected intercourse¹. Prevalence of infertility range from 3.5% to 16.7% in developed nations and 6.9% to 9.3% in developing nations². Infertility can be due to female factor, male factor or both; primary or secondary³.

Incidence of both primary and secondary infertility is 4-10% of all married couples⁴. Approximately 1/3rd of cases of infertility affecting couples are primarily attributable to women, 1/3rd to men, 1/3rd when interaction between the two and 10% of those remaining unexplained¹².

Female fertility is at its peak between the ages of 18 and 24 years⁶ while, it begins to decline after 27 years of age and drops at a somewhat greater rate after age 35. Ovarian dysfunction could be caused by weight loss or excessive weight gain with body mass index (BMI) greater than 27 kg/m².⁷

Overall, the likelihood of pregnancy without treatment declines by about 5% for each additional year of female partner age and 15-25% for each added year of infertility². Overall, the largest majority of spontaneous pregnancies occur within 3 years.² Diagnostic assessment of infertility is indicated when pregnancy has not occurred within

one year of regular unprotected intercourse, by which time 85-90% of couples attempting conception should be successful⁴. Earlier assessment is needed for women over the age of 35 years or for women with a history of oligomenorrhea/amenorrhea or suspected pelvic pathology or endometriosis and in case with suspected male factor infertility.

Hence, with this background the present study is designed to cover all the etiological aspects of infertility and assess the proportion of primary and secondary infertility.

Aims and Objectives

1. To study the prevalence of various factors contributing to female infertility.
2. To evaluate the comparative frequency of various factors in female infertility

MATERIALS AND METHODS

Study Design: It's a prospective observational study patient population presenting with complain of infertility.

Sample Size: 100 couples presenting with complain of infertility were included in the study.

Statistical Analysis: SPSS version 20 was used for analysis. T test was used to find the difference between two mean and p value less than 0.05 was considered significant.

Inclusion Criteria

1. Married Women in reproductive age group who could not conceive for 1 year.

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- Couple who had lived together for at least 12 months and undergone the required investigations.

Exclusion Criteria

- Couple who had not lived together for at least 12 months.

METHOD

During the study period, a total 100 couple presenting with primary and secondary infertility were evaluated.

The first step in evaluation in infertility was to obtain comprehensive medical, surgical, reproductive and family history and to perform a thorough physical and pelvic examination. After taking a detailed history and thorough examination, patient was subjected to various biochemical and radiological investigation depending on the finding of history and clinical examination. Pap smear was be obtained and sent for cytology. If any vaginal discharge was present, a sample of discharge was sent for culture and sensitivity.

The next step in the process was the semen analysis of the male partner, Patient with abnormal semen analysis were designated as male factor infertility.

While evaluating for female infertility, transabdominal/transvaginal ultrasound is important investigation of the patient to check for presence/absence of uterine factor of infertility like endometrial polyp, adenomyosis, uterine fibroid or ovarian factors like polycystic ovarian disease/syndrome. The transvaginal scan helps to evaluate the antral follicular count (AFC). A low AFC has been associated with poor response to ovarian stimulation and with a failure to achieve pregnancy.

Next step is biochemical evaluation. Follicle stimulating hormone (FSH) and Luteinizing hormone(LH) levels obtained on 2nd -5th day of cycle to measure ovarian reserve. Serum thyroid stimulating hormone (TSH) and prolactin levels were determined to identify thyroid disorder or Hyperprolactinemia, which may require specific treatment.

Hysterosalpingography(HSG) was performed on 8th-10th day of menstrual cycle to exclude various tubal and uterine factor of infertility.

Endometrial biopsy was limited to those in whom endometrial pathology was suspected or the ultrasound reports suggested some endometrial pathology.

Hysteroscopy was performed in selective patients to evaluate the uterine cavity. Diagnostic laparoscopy was performed to see the presence or absence of peritoneal factor of infertility like endometriosis and pelvic adhesion in suspected cases. It was performed in cases of unexplained infertility and normal HSG findings.

Serum anti-Mullerian hormone levels were measured.

OBSERVATIONS AND RESULTS

Out of 100 couple with history of infertility,78 couple had primary infertility and 22couple had secondary infertility.

In our study majority of subjects were in the range of 26-30 years, comprising 45% of the group study. The mean age of the female patients of our study came out to be 28.1± 4.7 years.

In our study according to the history 78% had regular menstruation, 22% of the patients had irregular menstruation.12% patients had history of dysmenorrhea.

In the present study 15% cases had history of Hypothyroidism, 4% hyperthyroidism,1% hyper-prolactemia,3% had history of major abdominal surgery.

In our study 3% had major surgical history in the past. After physical examination of the patients, none had abnormal secondary sexual characters,6% had acne, 16% had hirsutism,1% had acanthosis nigricans.

The mean BMI of the female patients was 22.3±2.5 with majority of patients having BMI of 18.5- 24.9.

Per speculum, per vaginal examination and bi- manual examination was done96% patients had normal finding,3% cases had vaginal discharge and 1% patient had cervical stenosis.

All women underwent hysterosalpingogram examination 91% cases had no abnormality,5% cases had unilateral tubal block, 3% cases had bi-lateral block and 1% patient has bilateral tubal block with arcuate uterus.

In the present study all the males underwent semen analysis, 82% had normal seminogram,10% had oligospermia,5% had azoospermia,1% had asthaniospermia and 2% had combined abnormality.

The various factors causing infertility in female were also analyzed separately to assess their contribution individually.

Ovarian factor was seen to have the highest percentage (35%) among the various factor of female infertility, 9% due to uterine factor, 8% due to tubal factor and 2% due to pelvic infection.

Table 1 Distribution of Cases According To Cause of Infertility

Findings in The Patient		No. of cases	Percentage
Abnormal	Normal	46	46 %
	Ovarian Factor	33	33 %
	PCOS	2	2 %
	Ovarian Cyst	4	4 %
	Fibroid	3	3 %
	Uterine Factor	1	1 %
	Structural Defect	1	1 %
	Adenomyosis	4	4 %
	Endometrial Polyp	4	4 %
	Tubal factor	2	2 %
U/L Tubal Block			
B/L Tubal Block			
Others	2	2 %	
Pid			

In the present study according to various female factors of infertility 35% had ovarian factor, 9% uterine factor and 8% tubal factor.

Table 2 Distribution of Cases Based on Various Female Factors

SNo.	Female Factor	No. of cases	Percentage
1	Ovarian Factor	35	35 %
2	Uterine Factor	9	9 %
3	Tubal Factor	8	8 %
4	Others	2	2 %

In this study femalefactors were responsible in 39%ofprimary infertility and 10% in secondary infertility likewise male factors were responsible in 15% of primary infertility and 1% in secondary infertility and both male and female factors were in 3% of the cases.

DISCUSSION

In our study we tried to diagnose the cause of infertility in patients presenting with the history of the same. This was done via the help of various clinical, biochemical, radiological, hysteroscopic and laparoscopic findings.

Age: Majority of our patients were in the age group of 26-30 years with the mean age of 28.1±4.7 years. 26% of the female patients also belonged to the age group of 21-25 years and only 1% of our patient above 41 years. In this study in contrast to current trend in developed countries to defer child bearing until the mid-30s, because of career and financial consideration, which results in diminished time frame available both for conception and for infertility evaluation⁶. In 2014, Haleem et al⁸ divided all the female infertile patients in their study in different age groups. 40.9% belonged to the age group of 25-35 years old while only 24.5% were 35-45 years old.

Zargar et al⁹ in their study on etiological aspects of infertility in India observe the mean age of female patients in their study as 28.3 years. Studies from developed countries have reported that about 25% of the women seeking infertility services are <24 years, whereas the percentage for the same age group in developing countries is 22-42%.

Education: It was found in our study that 91% of female patients were educated at secondary or higher level of education with mere 1% of patients being illiterate. Kazemijaliseh et al¹⁰ supports by their study in 2015, where they found statistically significantly ($p < 0.001$) higher education years in infertile patients than in the general population. G. Sudha et al¹¹ had a very similar observation in their study in Tirupati, India, where they concluded that the level of education had inverse correlation with the mean duration of infertility that is more the literacy level of the patient, less will be their duration of infertility and earlier will be their seek for medical help.

Regional Background: 69% couples belonged to urban background with the rest 31% to the rural background. In 2014, Haleem et al⁸ conducted a similar study in a very similar setup of a tertiary hospital of Bagdad. The results were quite similar to the one observed in our study with about 75% couples belonging to the urban background.

BMI (Body Mass Index): Bhansali et al¹² observed in 2006 that the mean BMI of Indian female was 25.75 kg/m². Our study had a mean BMI of 22.30 ± 2.5. Grodstein et al¹³ concluded in their study in 1994 that not only obese, but also overweight patients show increased risk of ovulatory infertility. Edward et al¹⁴ observed a U-shaped association between BMI and relative risk for BMI below 20.0 or above 24.0 kg/m². Similarly, van der Steeg et al¹⁵ concluded in their study that obesity is a risk factor of infertility due to anovulation and the fertility rate decreases by 4% with each unit increase in the BMI above the normal range.

Duration: 25% of patient in our study presented with their complaint within a duration of 1-2 years. There were several studies that observed higher period of infertility at the time of first presentation.

In our study of 100 cases of infertility, primary infertility was 78 and secondary infertility were 22, which was very similar to study done by Duignan et al¹⁶ they observed 77% primary and

23% secondary. These results were very similar to results from various studies, including from various developing countries, except for Menuba et al¹⁷, where they found much higher incidence of secondary infertility than primary infertility.

Factor of infertility: In the present study female factor contributed to the maximum i.e. 49%, male factor was 16%, combined and unexplained was found in 3% of cases. There has been significant variation in the percentage of various factors of infertility, but one point has been common despite this variation and i.e. the predominance of the female factor of infertility over all other factors individually.

Male factor: 100 males underwent semen analysis 82 males had normal semen analysis while 18 males had abnormal semen analysis. 10 of these abnormal semen analysis males had oligospermia, 5 had azoospermia, 1 had asthenospermia, 2 had combined abnormality of sperm.

Female factor: There are few major factors lead to female infertility. They are ovarian factor, uterine factor, tubal factor, peritoneal factor and cervical factor. The contribution in our study towards female infertility was 35%, 9%, 8%, 1% respectively.

Tubal factor infertility: Unilateral and bilateral tubal block contributed by 5% and 4% respectively of tubal factor of infertility. There was no case of hydrosalpinx in our study.

Ovarian factor of infertility: We noted in our study that a big majority of patients with ovarian factors of infertility suffered from PCOS that is 33%, and others like endocrine dysfunction, ovarian cyst 2%. Several studies were compared to see how these individual sub-factors contribute to the overall ovarian factors of female infertility. Nearly all the studies have demonstrated the dominance of PCOS in ovarian factor of infertility.

Cervical factors of infertility

There was only one patient in our entire study that had cervical stenosis. The patient was first diagnosed on bi-manual examination then later confirmed on hysteroscopy.

Summary

The majority of the patient in our study were within the age group of 26-30 years with only 1% patient being above the age of 41 years. 69% couples belonged to urban background with the rest 31% to the rural background. The mean BMI for the infertile patients was 22.3 ± 2.5. 78% couples presented with primary infertility and 22% with secondary infertility. In the present study female factor contributed to the maximum 49%, male factors were 16%, combined 3% and unexplained infertility was found 32%.

All male partners underwent semen analysis, out of which 82 male had normal semen analysis while 18 had abnormal finding.

Various major factors of female infertility were found to be leading cause. They were ovarian factor, tubal factor, uterine factor and cervical factor. Their contribution in our study towards female infertility 35%, 8%, 9%, 1% respectively.

The major sub-factor of ovarian factor of infertility in our study was PCOS being 33%.

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