

Retrospective Study on the Infertility Profile of Patients Reporting for *In Vitro* Fertilization and Embryo Transfer in a Tertiary Care Hospital in India

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ABSTRACT

Infertility remains one of the health problems in India like anywhere else in the world. Infertility affects about 15% of the population. After the advent of the first *in vitro* fertilization (IVF) in 1978, there remains a ray of hope for infertile couples to have their own biological child. Over the past decade, there has been a mushrooming of assisted reproductive technology (ART) clinics in all the major cities of India. The number of IVF cycles performed annually in these clinics has been steadily increasing. There is a lack of data on the number of IVF cycles performed annually as there is no central or nodal agency that collects analyzes and maintains the IVF database of these clinics. Our study has worked out the infertility profile of infertile married couples in a retrospective manner. Our study showed that blocked fallopian tubes remain the single most common cause of infertility in India.

Keywords: Embryo transfer, *In vitro* fertilization, Infertility.

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INTRODUCTION

Infertility remains one of the health problems in India like anywhere else in the world. Infertility affects about 15% of the population.¹ Several factors affect the pregnancy outcomes, ethnic differences being one of them.²⁻⁴ After the advent of the first *in vitro* fertilization (IVF) in 1978, there remains a ray of hope for infertile couples to have their own biological child.⁵ Due to a limited number of studies done and lack of representative sample from all the regions of India, the real magnitude of infertility and various variables like age, parity, ethnic, geographic, cultural, and racial differences remains to be studied. The lack of published data on the epidemiological profile of infertile couples in the Indian subcontinent is astonishing because there are a large number of ART clinics that offer IVF and intracytoplasmic sperm injection (ICSI) in all the metros and major cities of India. The present study aims to form a database of the infertile married couples of this representative population of our country. This study could form a basis for future research to study the different variables of infertility.

AIM AND OBJECTIVE

To study the infertility profile of patients reporting for assisted reproduction.

To determine common causes of infertility in the Indian population.

To determine the regional distribution of infertile patients in the Indian population.

MATERIALS AND METHODS

The present study was a hospital-based, observational epidemiological study, on the lines of the retrospective design. All the patients reporting for infertility to assisted reproductive technology (ART) center of a tertiary care hospital were included in the study. The study started on March 1, 2013 and concluded

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on July 31, 2014. During this period, all the new cases referred for management of infertility from the peripheral service hospitals formed the part of the study. All the patients referred from the oncology department for fertility preservation were excluded from the study. After the initial history taking and clinical examination of both the partners a battery of investigations were ordered (Table 1).

An IVF database of such patients was generated and evaluated for demographic distribution and the possible cause of infertility based on the clinical examination and investigation reports.

RESULTS

General Description of the Study Population

The study was undertaken in the ART center of a government hospital in New Delhi. The study included patients referred from the peripheral hospitals for the management of infertility through IVF and ICSI.

Infertility Profile

The details are presented in Tables 2 and 3 and Figures 1 and 2 discussed as follows:

Bilateral tubal block emerged as the most important cause of infertility in our study. Out of a total of 576 cases, 328 females showed bilateral tubal block on hysterosalpingography (HSG) or hysterolaparoscopy. Tubal pathology was seen in a significant number of cases comprising about 56.94% of cases. The other cases of infertility are summarized in Table 2 and Figure 1.

In our study, the country was divided into six regions (Fig. 3):

- The states of Punjab, Haryana, Himachal Pradesh, Jammu and Kashmir, Uttarakhand, Delhi, and the union territory of Chandigarh were included in the northern region.
- The southern region is comprised of Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Goa, Kerala, Union Territories of Puducherry, Lakshadweep, and Andaman's and Nicobar Islands.
- The western region is comprised of Gujarat, Rajasthan, and Maharashtra.
- The central region is comprised of Madhya Pradesh, Uttar Pradesh Chhattisgarh, Jharkhand, and Bihar.

Table 1: Investigations routinely done for infertility

<i>Investigations for a female partner</i>	<i>Investigations for a male partner</i>
Hemogram, ESR	Semen analysis
Urine exam (routine and microscopic)	Semen culture
Coagulation studies	Blood sugar levels
Blood sugar levels	Screening for HIV, VDRL, HCV, HBsAg
Screening for HIV, VDRL, HCV, HBsAg	FSH, LH (if indicated)
Hormone profile (on day 2 of the menstrual cycle) FSH, LH, prolactin, TSH, T3, T4	
Mantoux test, ELISA for TB	
Transvaginal sonography (on day 2 of the menstrual cycle)	
Hysterosalpingogram	
Hysterolaparoscopy	

- States like Odisha and West Bengal were included in the Eastern region.
- Assam, Sikkim, Meghalaya, Mizoram, Tripura, Nagaland, and Arunachal Pradesh were included in the northeastern region.

Twenty-three married infertile couples of Nepal who also reported for infertility were not included in the study.

Percentages of demographic distribution of infertility in infertile married couples were shown in Figure 2.

DISCUSSION

Infertility is a common problem of both developed and developing nations. There is a wide variation in the epidemiological and etiological aspects of infertility the world over. Despite a massive increase in population, infertility remains as important a health problem in India as elsewhere in the world.

Table 2: Major causes of infertility in infertile married couples

<i>Cause of infertility</i>	<i>Number of patients</i>	<i>Percentage</i>
Male factor	117	20.31
Tubal block	328	56.94
Endometriosis	23	3.99
Premature ovarian failure	3	0.52
Unexplained	30	5.20
Combined	72	12.50
Other causes	3	0.52
Total	576	

Table 3: Demographic distribution of infertility in infertile married couples

<i>Region</i>	<i>Number of patients</i>	<i>Percentage</i>
Northern	167	28.99
Southern	77	13.36
Eastern	38	6.59
Western	48	8.33
Central	201	34.89
Northeastern	22	3.81
Nepal	23	3.99
Total	576	

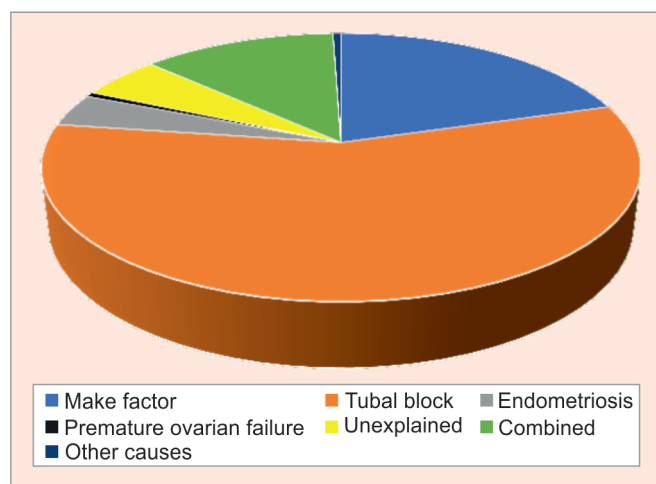


Fig. 1: Major causes of infertility in infertile married couples

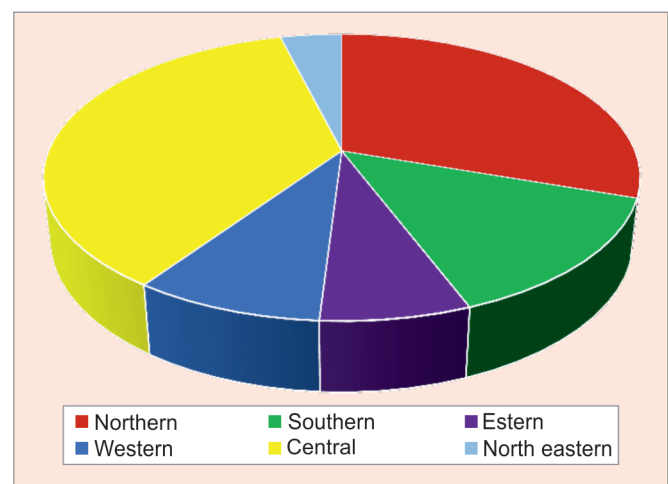


Fig. 2: Demographic distribution of infertility in infertile married couples

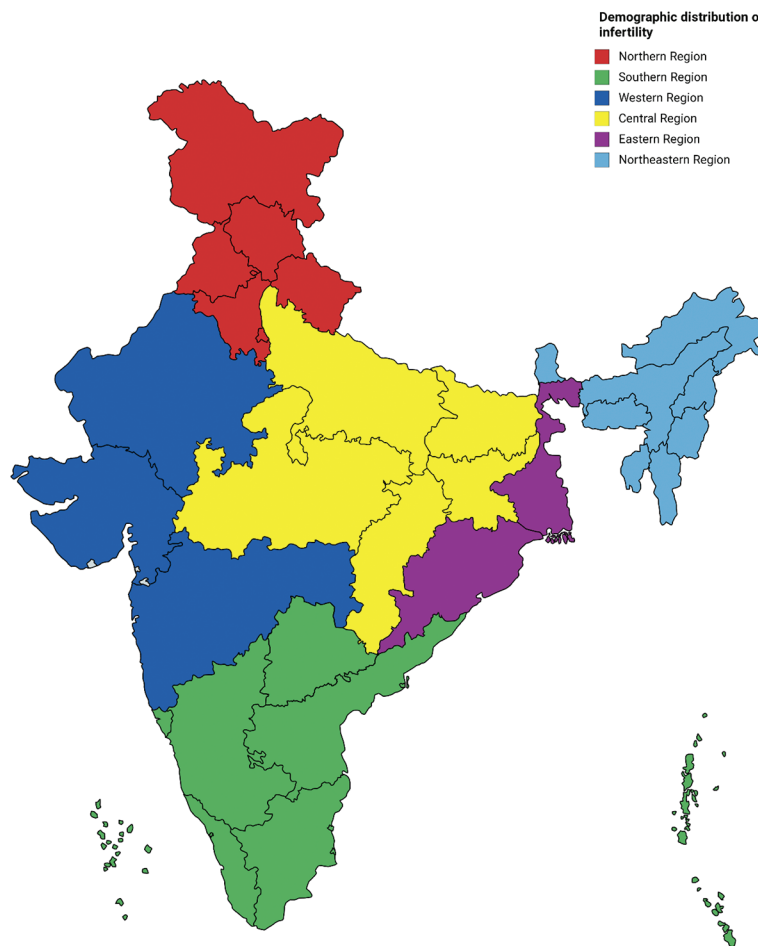


Fig. 3: Demographic distribution of infertile cases

Over the past decade, there has been a mushrooming of ART clinics in all the major cities of India. The number of IVF cycles performed annually in these clinics has been steadily increasing. There is a lack of data on the number of IVF cycles performed annually as there is no central or nodal agency that collects, analyzes, and maintains the IVF database of these clinics. One official publication reports that since 1981, private clinics in India have offered ART procedures including IVF and ICSI, and 60 clinics have been registered by the Ministry of Health.⁶ Moreover, these IVF clinics cater to the local clientele and their databases cannot be the representative sample of a large and diverse country like ours. There is inequality in accessing the ART centers especially by the low-income groups, therefore couples of high socioeconomic strata form the majority of patients receiving infertility treatment in private set up. In a government hospital, every infertile married couple has equal access to the ART centers irrespective of the social, ethnic, or economic background. One of the least studied aspects of infertile married couples remains the diverse variables like age group, geographic region, ethnic, cultural, and social differences in the presentation of these patients.

As many as 1–8% of the world's population has primary infertility, and secondary infertility occurs in up to 35%, depending on the geographical area. The most common cause of infertility among women in developing countries is attributable to tubal

damage from infectious diseases.⁷ Our study showed that blockage of fallopian tubes was the most common cause of infertility affecting 328 females out of a total of 576, thus comprising about 56.94% of cases. The most common etiological factor of the tubal block in Indian women is pelvic tuberculosis.⁸ The mainstay of treatment in pelvic tuberculosis remains 6 months of anti-tubercular treatment. However, the study of Marcus et al. concluded that *in vitro* fertilization-embryo transfer (IVF-ET) offers the only realistic treatment for tuberculous infertility.⁹ The second most common cause of infertility was deranged semen parameters, i.e., male factor infertility affecting about 20.31% of males in our study group. The majority of couples belonged to the Central region comprising about 201 out of a total of 576 cases, thus constituting about 34.89% of cases. The Northern region which included states like Himachal Pradesh, Jammu and Kashmir, Punjab, Haryana, Uttarakhand, and the Union Territory of Chandigarh reported 167 cases comprising about 28.99% of the cases. The International Working Group on ART Registries has collected and amalgamated national databases from both developed and developing countries.¹⁰ However, most of the developing countries lacked uniform definitions and data collection methods for generating IVF databases. Our study is the step forward in this direction for maintaining ART Registries. To the best of our knowledge, this study is the first of its kind to address the demographic profile of married infertile couples undergoing IVF in India.

CONCLUSION

Our study has shown the profile of infertile married couples in a retrospective manner. It has shown that blocked fallopian tubes remain the single most common cause of infertility in India. However, a significant percentage of cases showed male factor responsible for infertility. The central and northern regions of India reported the highest number of cases in our study implicating demographic differences in the presentation of infertility. More studies need to be undertaken at these tertiary centers which carry out hundreds of IVF-ET cycles every year. A central nodal agency for all the infertility clinics is the need of the hour which will collect, maintain, and analyze the data generated from all the clinics. To the best of our knowledge, this study is the first of its kind to address the demographic profile of married infertile couples undergoing IVF in India.

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