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PRIMARY INFERTILITY PROBLEMS AMONG FEMALE HAVE BEEN A SOURCE OF CONCERN IN INDIA LATELY

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ARTICLE INFO	ABSTRACT
Corresponding Author: **Ajeet Vasant Saoji** NKP Salve Institute of Medical Sciences and Research Center, Nagpur *Keywords: Primary Infertility, Polycystic Ovarian Syndrome, obesity, female*	**Background and objectives:** Primary infertility is a common, preventable but neglected reproductive health problem in developing countries like India. Considering the escalating incidence and its potentiality to create serious psychosocial complication the present study was undertaken in an attempt to find out some risk factors pertaining to female primary infertility. **Methods:** An Age, residence matched case-control study was conducted in two infertility clinics. A 240 cases and controls were selected at random.Data was collected using a constructed questionnaire including socio-demographic data. Gynecological history, questions about polycystic ovarian disease, endometriosis, fibroid, irregularity in menstrual cycle and intake of Oral Contraceptive Pills. **Results:**Evidence shown in this study allows the author to conclude that the significant risk factors for primary infertility among females are higher education, age at marriage >25, postponement of child bearing for ≥1 year, obesity, polycystic ovarian syndrome, irregular menstrual pattern, endometriosis, STI and age at menarche >14 years. **Conclusion:** Medical case studies, escalating incidence as well as the rising number of infertility clinics in urban areas of the country are pointing to the fact that infertility is becoming a health challenge in the country. We hope as treatment of infertility is expensive for the families especially in developing countries, identifying the risk factors can be of great help to prevent infertility in many females. ©2014 IJMHS, All Right Reserved

INTRODUCTION

Infertility is acquiring a proportion of global epidemic with the prevalence rate of approximately 8–12%. World Health Organization (1991) defines infertility as failure to conceive despite one year of cohabitation and exposure to pregnancy. If the couple has never conceived despite cohabitation and exposure to pregnancy (i.e. sexually active, non-contracepting, and non-lactating) for a period of one year, it is called primary infertility; primary infertility is also referred to as primary sterility.[1] It is estimated that globally 60-80

million couples suffer from infertility every year, of which probably between 15-20 millions (25%) are in India alone.[2,3] As per study, published at the end of 2012 by WHO, one in every four couples in developing countries had been found to be affected by infertility. [4] The magnitude of the problem calls for urgent action, particularly when in the majority of cases the infertility is avoidable.

Both partners in relationship contribute to potential fertility and both may be sub fertile. The female factors contribute almost half in the etiologies of infertility followed by male factors (30-40%), and the rest are attributed to a mixture of both or by problems unknown.[5] Identifiable factors affecting female infertility include hormonal or endocrine disturbances (menstrual or ovulatory disturbances), tubal factors (occlusions, pelvic adhesions and other tubal abnormalities), acquired non-tubal factors (cervical or uterine disturbances), sexual dysfunction and congenital abnormalities.[6]In addition to the core prevalence of infertility due to physiological conditions, additional cases are caused by the incidence of preventable conditions such as infection, "lifestyle factors", advancing maternal age, age at marriage, postponement in child bearing for more than 1 year or more, socio-economic status, and occupational hazards. Several of the states in India, many of them as big as the populous countries in the world, in particular the states namely Andhra Pradesh, Himachal Pradesh, Delhi, Tamil Nadu, and Maharashtra have been experiencing a dramatic and unprecedented fertility decline, reaching below replacement

level of total fertility rate (TFR) of 2.1 in the recent past. [7]Once considered to be a problem plaguing the West, infertility is rising alarmingly among urban Indian couples. According to Delhi IVF Fertility Research Centre, the gravity of the problem can be gauged by the fact that almost one in six couples in the metros have trouble conceiving on their own and need treatment.[8]Though new reproductive technologies are available (IVF) mostly in cities, but are very costly in so far that the large majority of the population cannot afford infertility treatment at all.

Infertility may not be a threat to physical health but carries with it extremely adverse social and psychological implications. As a result of their infertile status, they suffer physical and mental abuse, neglect, abandonment, economic deprivation and social ostracism as well as exclusion from certain social activities and traditional ceremonies.[9] Infertility has much stronger negative consequences in developing countries compared with those in Western societies In India where, traditionally, having children is mandatory in terms of family happiness and many people still think of infertility as a "woman's problem", this problem acquires crucial social actuality Thus the purpose of the study is to identify and quantify some risk factors for primary female infertility in Nagpur and to calculate Odds Ratios for the main modifiable risk factors.

MATERIALS AND METHODS

An Age and place of residence matched case control study was conducted in two private

infertility clinics from January to June 2013 at Nagpur. A total of 240 cases and controls were selected at random. This sample size was calculated to fulfill 80% power of study according to the prevalence of common risk factor of infertility. This data was entered in open Epi Software and sample size of 226 (113 cases and 113 controls) was calculated. Sample of 226 was rounded up to 240 (120 cases and 120 controls).Therefore, 120 gynecological confirmed cases (infertile females) were selected from infertility clinics. Total 120 controls were primigravidae females recruited from antenatal clinic. The following WHO definition was used to consider the female as having primary infertility- "If she has never conceived despite cohabitation and exposure to pregnancy (not contraception) for a period of one year." These cases were diagnosed by Gynecologists in the infertility clinics.

Data was collected using a pretested structured questionnaire including socio-demographic data. The co-relates with primary infertility were: age, education, place of residence, Socio-economic status, occupation, age at marriage and postponement in child bearing for more than 1 year or more. Females were inquired for having addiction to substances like tobacco and alcohol. Female was considered to have stress, if she admits having stress pertaining to Occupation, family problem or any other factor. Medical conditions included Thyroid diseases and obesity. Relevant gynecological history included

questions about polycystic ovarian syndrome (PCOS), endometriosis, fibroid, irregularity in menstrual cycle and intake of Oral Contraceptive Pills (OCP). Health records were also verified.

Ethical Considerations: This study protocol was approved by institutional ethics committee of a tertiary care hospital. Before conducting the interview the investigator explained the purposes of this study, the risks and the benefits, and the voluntary nature of participation to the women and their informed consent was obtained. Privacy and confidentiality was ensured. All the authors from the department of community medicine conducted face to face interview to collect data.

Statistical Analysis: Data analysis was done by using Open Epi software. A Chi square test was used to determine the association of various risk factors with primary infertility. Univariate analysis for risk calculation was done by odds ratio with 95% Confidence Interval.

RESULTS

This study was conducted in two private infertility clinics in, January to June 2013 at Nagpur. It included 240 females distributed equally between cases of primary female infertility and controls matched by age. The mean age was 31.8 years. Majority of infertile female were from urban area.

Table 1: Association with cases of primary infertility and controls according to demographic and some personal characteristics

Risk Factors	Cases n=120 (%)	Controls n=120 (%)	Chi-Square	P-Value	OR	Confidence Limit
Age at marriage						
≥25 years	75(68.7)	34(31.2)	28.25	0.0001*	4.21	2.45-7.25
<25 years	45(34.4)	86(65.6)				
Education						
≥ Graduate	109(52.7)	98(47.3)	4.25	0.039*	2.22	1.02- 4.82
Below Graduate	11(33.3)	22(66.7)				
Occupation						
Working	80(47.1)	90(52.9)	2.017	0.0778	0.66	0.38- 1.16
Housewife	40(57.1)	30(42.9)				
Obesity						
Yes	58(77.3)	17(22.7)	32.6	0.0001*	5.66	3.03-10.6
No	62(37.6)	103(62.4)				
Thyroid problem						
Present	09(45.0)	11(55.0)	0.218	0.6404	0.80	0.32-2.01
Absent	111(50.5)	109(49.5)				
Addiction(smoking and alcohol)						
Yes	06(37.5)	10(62.5)	1.071	0.302	0.57	0.20-1.64
No	109(49.8)	110(50.2)				
Stress						
Yes	69(51.9)	64(48.1)	0.421	0.51	1.18	0.71-1.97
No	51(47.7)	56(52.3)				
Postponement of child bearing for ≥1 year						
Yes	20(74.1)	07(25.9)	7.05	0.007*	3.22	1.31-7.95
No	100(46.9)	113(53.1)				

* Significant, OR= Odds Ratio

Table 1

The present study showed that 68.7% infertile female married after age twenty five as compared to control 31.2%, with an estimated odds ratio OR was 4.2 (95% CI 2.45-7.25).

Approximately 52.7% of primary infertility cases received educations of Graduation and above compared to 47.2 % of the control and estimated OR of 2.2,(95% CI 1.02-4.82).

Occupations other than housewives were observed in 47.1% of cases compared to 52.9% of controls, with an estimated OR of 0.6, (95% CI 0.38-1.16).

Obesity was reported in 77.3% of cases compared to 22.7% of controls with an OR 5.6 (95% CI 3.03-10.6).

Thyroid problem was reported in 45.0 % of primary infertile females compared to 55.0% of controls with an estimated OR of 0.8, (95% CI 0.32-2.01).

Approximately 37.5% of primary infertility cases were addicted to smoking and/or alcohol compared to 62.5% of the control and estimated OR of 0.5, (95% CI 0.20-1.64).

Stress was reported in 51.9 % of primary infertile females compared to 48.1% of controls with an estimated OR of 0.5, (95% CI 0.71-1.97).

The present study showed that 16.7% of infertile female postponed child birth for more than one year as compared to control 5.8% with an estimated OR of 3.2, (95% CI 1.13-7.95).

Table 2: Association with cases of primary infertility and controls according to gynecological characteristics

Risk Factors	Cases N=120 (%)	Controls N=120 (%)	Chi-Square	p-Value	OR	Confidence Limit
Polycystic ovarian Syndrome						
Yes	56(82.4)	12(17.6)	39.73	<0.0001*	7.875	3.9-15.79
No	64(37.2)	108(62.8)				
Menstrual Pattern						
Irregular	47(70.1)	20(29.9)	15.09	0.0001*	3.21	1.76-5.88
Regular	73(42.2)	100(57.8)				
Fibroid						
Present	04(57.1)	03(42.9)	0.147	0.70	1.34	0.29-6.14
Absent	116(49.8)	117(50.2)				
Endometriosis						
Present	06(85.7)	01(14.3)	3.67	0.05 *	6.26	0.74-52.8
Absent	114(48.9)	119(51.1)				
OCP Intake						
Yes	19(48.7)	20(51.3)	0.03062	0.8611	0.94	0.47-1.86
No	101(50.2)	100(49.8)				
STI						
Yes	31(72.1)	12(27.9)	10.23	0.001*	3.13	1.52-6.46
No	89(45.2)	108(54.8)				
Age at menarche						
>14years	42(62.7)	25(37.3)	5.98	0.01*	2.04	1.14-3.64
<14years	78(45.1)	95(54.9)				

* Significant, OR=Odds Ratio

Table 2
Polycystic ovarian syndrome (PCOS) was reported in 82.4% of primary infertility cases compared to only 17.6% of the controls and the estimated OR of 7.8, (95% CI 3.92-15.79).
About 70.1% of cases had irregular menstrual cycle compared to only 29.9 of controls, OR of 3.2, (95% CI 1.76- 5.88).
Fibroids were reported in 57.1% of infertile cases compared to 42.9% of controls, OR was 1.34, (95% CI 0.29- 6.14)
Endometriosis was reported in 85.7% of cases and 14.3% of controls and the estimated OR of 6.26, (95% CI 0.74-52.8).
OCP intake was reported in 48.7% of cases and 51.3% of controls and the estimated OR of 0.94, (95% CI 0.47-1.86).
Sexually transmitted infections (STI) were reported in 72.1% of cases versus 27.9% of controls and an estimated OR of 3.3, (95% CI 1.52- 6.46)
About 62.7 of females with primary infertility had delayed age of menarche (>14 years) compared to 37.3% of controls and an estimated OR of 2.04, (95% CI 1.14- 3.64)

DISCUSSION

Demographic characteristic of the females is one of the factors affecting fertility. In the present study the majority of cases with primary infertility were from urban area.

The researcher's reveals that, age at marriage > 25 years proved to be a significant risk factor for primary infertility which is comparable with the finding of the study done in Egypt in 2006, [10] and according to National Family Health Survey-3.[11] Similarly a survey conducted across nine cities including 2,562 patients by 'Helping families' endorsed by the Indian Society for Assisted Reproduction (ISAR) reported that about 46% of Indians in the age group of 31 to 40 years seeking medical help for conceiving a child were found to be infertile meaning they were unable to conceive even after two years of trying for a child. [12]

Unhealthy weight gain can negatively impact the reproductive system, leading to difficulties in conceiving. Hence lifestyle modifications such as disciplined eating habits, increased level of daily physical activity and regular exercise are important for maintaining a healthy body weight. Obesity proved to be significantly associated with primary infertility in present study and this result indicates that the obesity is an important factor that is congruent with some national and international studies. [13, 14]

The results of our study suggest that with increasing levels of educational attainment among women, primary infertility rate increases. This can be related to the fact that with aspirations for attaining higher educational level, marriage is delayed as a result of which in

confirmation with aforementioned causation factors (higher age at marriage, job, urban living style etc.) The present findings are also consistent with the other studies conducted in India. [8, 11, 15]

Postponement of first child is mostly an issue of western world, and recently the process is spreading to countries in developing world like India. Our study showed that Postponement of child bearing for ≥1 year is significantly more in infertile females. A variety of explanations have been offered like increase in educational levels, employment, career and insecurity. According to a survey conducted by population council, New Delhi, among 50,848 married and unmarried young women and men, 51% of married young women wanted to delay the first pregnancy. [16]

Thyroid problem was not found to be a risk factor for primary infertility in the present study which contradicts the findings by Goswami B, where authors reported that a relatively higher occurrence of hypothyroidism in primary infertile females, when compared to the control group, reflects the tendency of infertile females towards thyroid insufficiency or the vice versa. [17]Similarly working status, stress and addiction were not found to be risk factors for primary infertility; this finding contradicts to findings of other studies, which may be explained by inter-country or local cultural background. [9, 11, 14]

The present study showed that the Polycystic ovarian syndrome (PCOS) was a significant risk factor associated with primary infertility with an agreement with voluminous literature

indicating similar significant association from different areas in developed as well as developing countries. [10,18] Similarly a study conducted at Bangalore, India by Rajashekar L, revealed that, among (2270) infertility females seen in the last five years, 46.50% (1057) were PCOS patients and 84.76% of these females had primary infertility, most of whom 71.53% were in the age group of 21-30 years. [19]

Menstrual irregularities in the form of any deviation from normality like, oligomenorrahia, hypo or hypermenorrhgia were also significant risk factors for primary infertility which are the similar finding in study conducted by Shamila S in 2011, where she found menstrual irregularity among infertile females in the three study areas (40%, 44.85%, and 44.11% respectively) and was positively correlated with female infertility. [15]

Sexually transmitted infections (irrespective to the causative agents) or its sequaelae as tubal fibrosis and obstruction were extensively studied and proved in developed as well as in developing countries. Similarly, recent findings with significant association proved by Mania-Pramanik J, regarding Trichomonasvaginalis infection with infertility adds 'more support to the current study. [20]

Furthermore, recent laboratory investigations done by Adamson PC and his colleagues in Mysore, India, as they observed a high significant seroprevalence of antibodies to herpes simplex virus-2 in primary infertile females, which support the significant finding in observational studies about primary infertility. [21]

Other gynecological factor endometriosis was also significantly reported as risk factors for primary infertility with compatible support from the study conducted by Dutta S and Mokhtar S. [8, 10]

In accordance to the present study, Mokhtar S [10] in their study revealed that females with age of menarche more than 15 years were more risky to develop infertility than those with age of menarche less than 15 years. Similar findings were also reported by Komura H. [22]

No association was found between history of fibroid which contradicts the findings by, Mokhtar S. [10] OCP intake was also found to be non significant with primary infertility in present study Many studies on oral contraceptive pills (OCPs) have found a short-term delay in the return to fertility, but no study has suggested long-term or permanent impairment. [23]

CONCLUSION

Medical case studies, escalating incidence as well as the rising number of infertility clinics in urban areas of the country are pointing to the fact that infertility is becoming a health challenge in the country. Evidence shown in this study allows the author to conclude that the significant risk factors for primary infertility among females are higher education, age at marriage>25, postponement of child bearing for ≥1 year, obesity, polycystic ovarian syndrome, irregular

menstrual pattern, endometriosis, STI and age at menarche >14 years. Treatment of infertility is expensive for the families especially in developing countries and identifying the risk factors can be of great help to prevent infertility

in many females. Efforts are needed to raise awareness of the causes and consequences of this condition.

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