Original Article

Fertility trends in Indian IT sector: A web chat based cross-sectional study

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Abstract

Introduction: The Indian information technology (IT) industries have continued to be the largest private sector employer till today. The enrolment of women in higher education is about 40%, which signifies that more women are ready to pursue higher education. The job involves good pay packages, pick drops, incentives, personnel management appraisals, and better exposure but at the same time requires constant psychological balance and mental exercises. Thus, keeping these facts in mind, the present study intends to explore the nature of occupational impact on women's health and to analyze the prevalence of infertility in Indian women working in IT sector.

Materials and Methods: This is an observational study, based on a web consultation conducted in June 2016 with the women working in Infosys Ltd; 970 women took part in the chat, and questions were asked regarding the health problems faced by them. On the basis of these questions, an analysis was conducted to explore the health problems in women working in IT sector and prevalence of infertility among them.

Results: Out of 970 women, 311 (32%) women were suffering from infertility, and majority (62%) of them were above the age of 30 years. Gynecological problems were also common in these women (28%); amid there, menstrual irregularity was being the most common one (82%). Besides this, polycystic ovarian syndrome was also found in 10% of the participants.

Conclusion: It can be concluded that due to multiple factors, the infertility rates are high in women working in IT sector, and an attempt has to be made by timely counseling, avoiding drugs and alcohol abuse to minimize reproductive issues.

Keywords: Infertility, information technology, menstrual irregularity, PCOS

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INTRODUCTION

Infertility is an important public health issue with serious social consequences. Demographically, infertility is defined as inability of a noncontracepting, sexually active woman to have a live birth.[1] Clinically, 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.[2] Broadly, infertility may be classified as primary or secondary. Primary infertility refers to infertility of a couple, who have never been able to conceive, whereas secondary infertility is the failure to conceive following a previous pregnancy. Etiology of infertility varies from region to region and from one population to another and even from one locality to another within the same population. The reproductive system is subjected to the

Access this article online	
Quick Response Code:	Website: www.fertilityscienceresearch.org
	DOI: 10.4103/fsr.fsr_22_16

How to cite this article: Dhorepatil B, Singh K, Chandge A. Fertility trends in Indian IT sector: A web chat based cross-sectional study. Fertil Sci Res 2016;3:26-30.

environment with its cultural, religious, political and socioeconomic factors. Furthermore, the incidence of infertility among couples is associated with the life style, stress, postponing parenthood, and obesity. The problem of infertility may also arise as a result of high level of sexual mobility, premarital sex, extramarital sex, and prostitution.[3]

Primary infertility is a rapidly emerging issue in India affecting about 4–17% of couples with increasing trend over last decade.[4] Until recently, not much attention has been given on the impact of occupational and social factors on infertility trends and consequences of infertility in India. An understanding of the levels of infertility among couples working in different profession is crucial to formulate and maintain policies for the betterment of society. Drastic shift of income flow from agriculture to industry was noticed after 1960 but today major contributor to the national income is the service sector all over the world. India stands seventh in the world by its nominal GDP income growth of over 7%. It is classified as ″Newly Industrialized Country″ and ranks third largest nation by purchasing power parity. According to World Bank's growth outlook, India topped the economic growth for the first time by 7.3% in 2014–15 and the latest India Development Update expects India's economic growth to be at 7.5% in 2015–16, followed by a further acceleration to 7.8% in 2016–17 and 7.9% in 2017–18. Indian information technology (IT) industries have continued to be the largest private sector employer till today. Favorable work environment and indiscriminate gender policies of MNCs have encouraged women to get full time job placement in IT, HR, Finance, etc. About 25% of the women are employed at IT sector based on the education, talent, and operational skills. Acknowledging these facts, the present study is conducted to explore the nature of occupational impact on women's health and to analyze the prevalence of infertility in Indian women working in IT sector (Infosys Ltd).

MATERIALS AND METHODS

This is an observational study, based on a web chat consultationthat took place in June 2016 over a period of 1 week. All eligible women working in Infosys Ltd from all over India were invited through web announcement/printed circular to ask their queries on major women health issues and infertility problems faced by them. Their queries were analyzed and responded in a week time by an expert team of IVF specialists at a Pune-based infertility center.

A total of 970 women took part in the web chat. Their enquired problems were of varied nature ranging from general health issues to specific infertility-related queries. Queries were categorized into six domains of female health including infertility, gynecological, obstetrical, polycystic ovarian disorder, contraception, and miscellaneous.

Data analysis

Standard statistical calculation and charts were used to represent the results. Data analysis was performed to explore the health problems in women working in IT sector and prevalence of infertility among them. Definitive variables including their age, region, religion, education level, lifestyle, and menstrual history were also extracted from web chat to determine the etiology and prevalence of infertility.

RESULTS

This "web chat study" specificallyperformed on IT sector employees unveiled infertility as one of the most commonly discussed issue affecting 311 (32%) women. Gynecological issues, obstetric problems, polycystic ovarian syndrome (PCOS), and contraception were other health problems affecting 27, 19, 10, and 4% of women, respectively [Figure 1]. Menstrual irregularity was found to be the most common gynecological problem affecting 216 women (82%). Other obvious problems discussed in this web chat were vaginal discharge, pelvic pain, PCOS, and sexual issues.

Prevalence and major causes of infertility were investigated in detail based upon their chat contents. Out of 970 women, 311 (32%) women were affected with the misery of infertility, and majority (62%) of

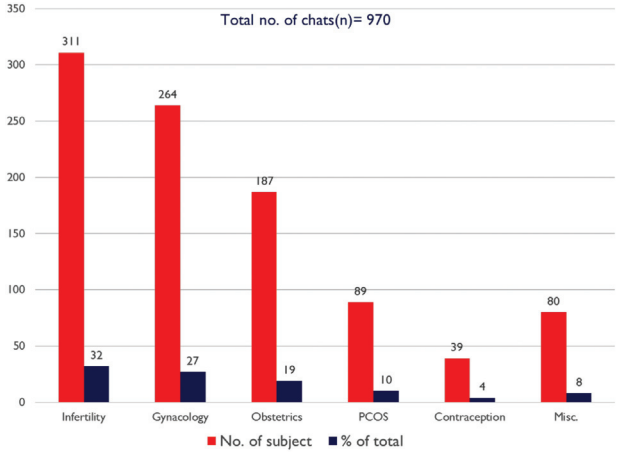

Figure 1: Common health problems in women working in IT sector (*n* = 970)

them were above the age of 30 years. Most common age group affected with infertility was 30–35 years (51%) [Figure 2]. Other obvious causes of infertility in this study were PCOS (20%), endometriosis (15%), pelvic inflammatory disease (15%), and various anatomical causes (12%). Thirty-eight percent of the women suffering from infertility issues could not communicate the specific cause for the same [Figure 3].

DISCUSSION

Human bodies evolved to be ″in tune″ with their environment. This connection is vital for reproduction, as birth of the young must coincide with plentiful food, and, thus, a high chance of survival. Although humans are not ″seasonal breeders,″ we show sexual behavior and reproduce all year round, because our fertility is influenced profoundly by our environment, including season and food intake. In recent years, the postulated threat to fertility from exposure to environmental ″endocrine disruptors″ has loomed large, but proven examples are elusive. The hormones that control fertility (the sex hormones) are also influenced by other hormones, in particular those determined by our diet and sugar intake (e.g., insulin).[5] The progressive increase in obesity in many Western cultures, therefore, brings with it fertility problems.

World Health Organization explains primary infertility as inefficiency to conceive after 1 year of unprotected sex and secondary if not conceived following previous pregnancy. Biological and social factors including stress due to economic status, religious attitudes, age of marriage, urbanization leading to modernization, higher literacy, contraceptive usage, and nuclear families play a significant role in lowering fertility.[6] In this unique "web chat based cross-sectional study," we tried to explore the impact of a specific profession on common women health problems with infertility as a center of interest.

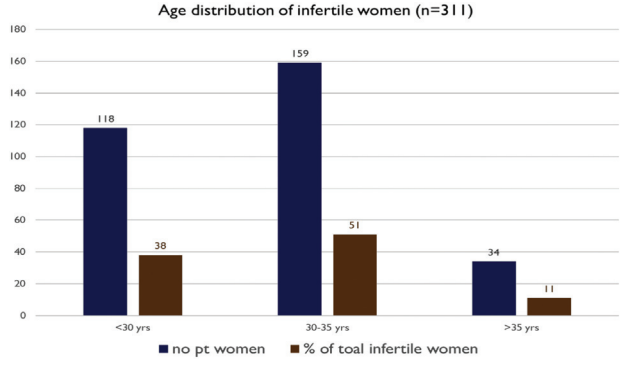

Figure 2: Age distribution of infertile women in IT sector ($n = 311$)

We chose women employees of Infosys Ltd, which is ranked among top five Indian IT services along with Tata Consultancy Services, Wipro, Cognizant, and HCL Technologies. Infosys has a total of 193,383 employees as of 15 January 2016, of which 35% were women, and 93.8% are software professionals.

Several factors are responsible for preferential employment of women in IT sector and BPO in India with total women participation of about 40%. The women participation at BPO contributes to about 50%, as most of the women prefer part-time or contractual jobs to maintain work life balance. The enrolment of women in higher education is about 40%, which signifies more women are ready to pursue higher education. This has led to a socioeconomic change in young women, and they have started practicing over more full time jobs in IT, HR, Finance, among other. Moreover, IT companies in India provide indiscriminating gender policies for job placements. Infosys Ltd employs highest percentage of women employees (35%) followed by Tata Consultancy Services Limited employing about 31% of women. The job involves good pay packages, pick drops, incentives, personnel management appraisals, and better exposure. The work does not involve rigorous physical exercises and so could suit women but requires constant psychological balance and mental exercises.

In general, 10% of the general population in India suffer from some form of infertility. Higher rate of infertility issues in IT sector (32% in this web chat analysis vs. 8% married women in DHFS-2007-08) may be explained by their job profile and partly by the difference in treatment seeking behavior and reporting bias. It has been observed that most of these women had high level of the hormone

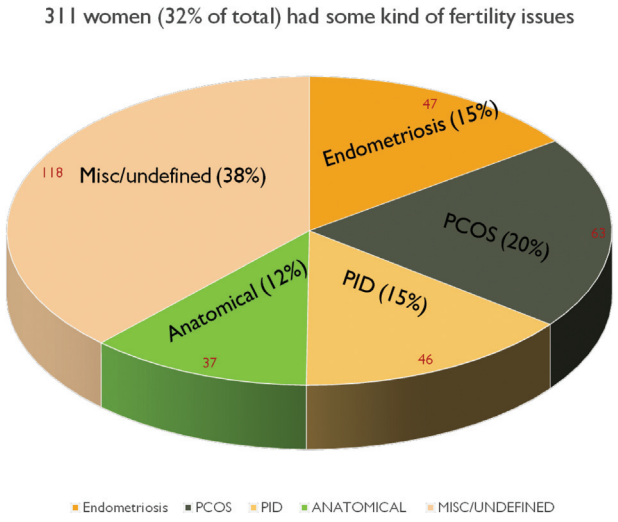

Figure 3: Prevalence and major causes of infertility

cortisol, which is caused mainly due to stress. Most of the women in IT industry are prone to addictions such as smoking, drinking, and problem-prone unconsummated marriage. Their job timings vary according to the shifts, which cause change in their scheduled pattern of eating, drinking, and sleeping leading to psychological pressure (stress) and hormonal imbalance. Stress could also be caused due to long working hours, constant under pressure situation, unrealistic deadlines to be met, peer pressure, promotion and job security pressure, maintenance of work life balance, among others.

A similar study including 125 women conducted in a BPO sector revealed in Times of India on 8th March, 2013 that above 90% of the women working in Mumbai at call centers and in corporate jobs were suffering from irregularity of menses (scanty or prolonged). About 35% of the executives interviewed were already suffering from amenorrhea, and 25% of the women tried at least IVF once without any result.

Infertility was found more prevalent in the age group of 30–35 years accounting 51% of total infertile women. It can be reasoned that most women in intellectual employment sector as IT get married after 30 years of age and, thus, already crossed the peak reproductive period, that is, 22–29 years. "Helping Families" survey and several others have confirmed the same findings. ″Helping Families″ survey was conducted with a joint effort of Asia Pacific Initiative on Reproduction, along with Indian Society for Assisted Reproduction and was supported by pharma-industry major MERCK in nine cities in India: Mumbai, Delhi, Ahmedabad, Kolkata, Chennai, Bengaluru, Hyderabad, Agra, and Kochi, among 2562 respondents. This survey revealed that 46% of the couples in the age group 31–40 years were found to be infertile; and 49% of the couples in the same age group from South India were infertile. Fear of getting settled, adopting new area and client, client direct pressure at on-site, and ignorance about the countries policies would also increase pressure (stress). Secondary to these socioeconomic pressures, women prefer to complete their education and pursue their careers before starting a family. This, sometimes, means that childbearing is postponed till women are in their late twenties or early thirties causing natural reduction in fertility of women. This vicious cycle stress leading to infertility and infertility would cause stress.[7]

Overall, the rate of infertility has decreased by 7.7% from NFHS-2 to NFHS-3. It is around 2% in NFHS-2 (1998–99) and around 1.85% in NFHS-3 (2005–06). But, an increase in infertility rate has been observed among women with higher education, urban life style, increased age at first marriage, professionals, and Christian religion. Standard of living and mass media exposure have inverse relationship with infertility rates.[8]

PCOS is one of the common causes of female infertility in India affecting 25–30% of young Indian women. In this study, PCOS was found to be associated with infertility in 20% of women and affected 10% of participants. Franks[9] found that women with PCOS were concomitant with increased risk of infertility, which is true in the present study where PCOS was the major cause for infertility. PCOS − so-called because the ovaries contain many small follicles − is one of the most common causes of infertility and is associated with a failure of ovulation. A tenable hypothesis is that polycystic ovaries and the associated hormone abnormalities (principally, excess secretion of testosterone by the ovary) are genetically programmed during ovarian development in the fetus.[10] However, there is also an interaction with key environmental factors, especially nutrition. PCOS is characterized by a cluster of metabolic abnormalities, including a tendency to accumulate abdominal fat, as well as resistance to and hyper-secretion of insulin.[11] The consequences of abdominal obesity in women with PCOS include an increased chance of anovulation and infertility, excess secretion of testosterone (resulting in unwanted body hair) and, in the long term, a greatly increased risk of developing type-2 diabetes in later life.

An unpublished survey conducted by a multinational chain of pathology laboratories on 27,411 testosterone samples over a period of 18 months has correlated prevalence of PCOS with dietary factors. Out of all the samples, around 4824 had PCOS-associated hormonal risks. Among the samples tested, the eastern part of India showed a high number of women affected by PCOS. As many as 25.88% women of eastern part of India were affected by PCOS, followed by 19.88% in west India, 18.62% in north India, and 18% in the southern part of India. The explanation for high prevalence of PCOS in eastern part of India (Kolkata) was assumed to be due to the high consumption of rice and carbohydrates in their diet.

Apart from PCOS, a number of other factors were found to negatively affect female fertility in IT

professionals. Endometriosis (15%), PID (15%), and obvious anatomical factors (12%) were few of them to enumerate. In a studyconducted by Chaudhary *et al.*,[12] the prevalence of endometriosis among subfertile women was 16.66% in India, which is consistent with this report (15%). Endometriosis can lead to anatomical distortions and adhesions. It has been suggested that endometriotic lesions release certain agents which are harmful for gametes or embryos.[13] Endometriosis has been involved with 12.5 and 11.1% of primary and secondary infertilities, respectively. The most common causes responsible for infertility were tubal occlusion, endometriosis, and adhesions.

Negative impact of occupation on fertility has been evaluated occasionally in literature. Hordaland Health Study, a cross-sectional study, investigated the risks of negative reproductive outcome among female hairdressers. The study was conducted on 16,907 women, and it was shown that infertility and spontaneous abortion were higher among female hairdressers than those among women in other occupations (adjusted relative risks: 1.30; 95% confidence intervals: 1.08–1.55 and 1.31; 1.07–1.60, respectively).[14]

With the advancement of medical sciences, of recent times, about 85% of the causes of infertility can be taken care of by using appropriate surgical and medical interventions such as assisted reproductive technology.

IT companies should formulate exhaustive guidelines and implement them strictly to regularize working hours, leaves, job security, and timely promotions of their young female employees. Policies should ensure that the rights of women as employee of these high profile companies are not compromised in any way. All big MNCs should hire professional health counselor, organize regular counseling sessions and health checkups, and intervene in timely manner to reduce the risk of infertility among their eligible female employees.

To conclude after considering multiple factors, it is ascertained that infertility rates are undoubtedly high in women working in IT sector. As a remedial process, an attempt has to be made by active and aggressive counseling, avoiding narcotic drugs and alcohol use, and indulging in healthy eating practices. Besides this, with increasing age, active evaluation of infertility and management should be enforced.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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