Study on infertility and related factors among women in Bangladesh: Survey in Rajshahi City

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ABSTRACT

Background: Infertility is a common medical problem among women, and in many traditional societies, women are usually considered to be responsible if married couples are unable to bear children. The objective of the present study was to investigate the problem of infertility among women seeking treatment at Rajshahi City in Bangladesh.

Methods: A total number of 500 infertile women were considered in the present study. Data were collected from Motherland Hospital and Infertility Centre at Rajshahi in Bangladesh during the period of February to August 2016. In this study, convenient sampling was used for selecting sample, t-test and z-proportion test were utilized in this study.

Results: In the current study revealed that more than 60% women had been suffering from the primary infertility. More than 68% infertile women were trying for getting baby for last 5 years. Most of the women (82.8%) did not attempt to get pregnant at specific period of their menstrual cycle. Many of them (79.6%) were not aware about the concept of fertile period. Larger percentage of the individuals was educated housewives. It was noted that husbands' age was significantly larger than infertile women age (p<0.01).

Conclusion: Authorities should provide basic education on fertile period to educated housewives, and organize more general campaign on infertility for working mothers and those who were less educated.

Keywords: Infertility, Women, Socio-demographic factors, Rajshahi City, Bangladesh

INTRODUCTION

Infertility is defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (Zegers-Hochschild *et al.*, 2009). It is an important public health problem affecting not only individuals but also mental and social well-being of the whole family (Manna *et al.*, 2014). Primary infertility refers to inability to conceive within two years of sexual exposure, and secondary infertility refers to the inability to conceive following a previous pregnancy (World Health Organization, 2014). Primary infertility has been the predominant component of infertility as a whole (Inhorn, 2003), and its incidence has continued to rise most likely due to the changes in social behavior such as delayed child bearing (Nicopopullos and Croucher, 2003).

Himmel *et al.* (1997) reported that 3-7% of all married couples were troubled by infertility in worldwide. In a more recent study, World Health Organization (2014) estimated that 60 to 80 million couples suffered from infertility throughout the world. Based on research conducted in 190 countries between 1990 and 2010, it was noted that the overall burden of infertility among men and women was rather similar (Mascarenhas *et al.*, 2012). Another recent study also reported that the prevalence of infertility among men and women were almost the same (20-35%) (ART fact sheet, 2018). There are many physical and biological causes of infertility (Makar and Tohth, 2002), and irregularity of ovulatory cycle is one of the common causes for women (National Health Service, 2017). For men, poor quality and quantity of spermatozoa in the semen is the predominant cause, and result of seminal fluid examination has been used as a surrogate measure for male infertility (Cooper *et al.*, 2010). However, in 10-20% of the cases, a definite cause could not be identified (ART fact sheet, 2018).

Bangladesh is a densely populated country with a population of about 166 million (Bangladesh Bureau of Statistics, 2011). Despite the large population, infertility is not uncommon, and the overall incidence has been noted to be rising over the past few decades (Kumar *et al.*, 2007). Women in this country are expected to take care of the husband and children at home, and many of them are also contributing as workforce of the nation. A few studies have reported that infertility in women can be associated with level of education, age, age at marriage, occupation, and menstrual history (Govindasamy and Malhotra, 1996; Dixon-Mueller, 1998). Other studies on female infertility in developing or underdeveloped nations were mostly conducted in Africa and India (Manna *et al.*, 2014; Ombelet *et al.*, 2008). There is very little information on female

infertility in Bangladesh, and hardly any resources have been allocated to address this problem. The present study was conducted to assess infertility among women in Rajshahi City, Bangladesh, and an attempt to identify risk factors associated with infertility especially in this region.

METHODS

Data was collected from Motherland Infertility Centre and Hospital (MICH) in Rajshahi City (RC), Bangladesh. MICH is one of the busy clinics in RC that offers consultation and treatment for infertile women coming from various parts of the country. In this study, women from RC who has been diagnosed to have infertility were considered. An appropriate mathematical formula was used to calculate the sample size, 80% power of study and 5% level of significance were considered. All essential information for calculating sample size was used in the study following Manna *et al.* (2014). The mathematical formula provided that 480 subjects were adequate for this study, but for better accuracy 500 subjects were included. From February to August 2016, 500 women with infertility were enrolled using convenience sampling. All the women were interviewed by two of our trained female researcher, and information was gathered using a standard questionnaire. Socio-demographics, behavioral and reproductive health characteristics were collected for analysis.

In this study, the association between infertility and various demographic, social behavioral and environmental factors as well as reproductive health characteristics like menstrual pattern. The subjects were investigated these parameters were selected on the bases of previous publications on infertility (Manna *et al.*, 2014; Adamson *et al.*, 2011; Ali *et al.*, 2011; Lei *et al.*, 2015).

Frequency distribution, t-test and χ^2- test were used for data analysis in this study. Statistical significance was accepted at $p<0.05$. All statistical analyses were performed using IBM Statistical Package for the Social Science software version 19 (SPSS, Chicago, IL, USA).

RESULTS

Mean age of the 500 respondents was obtained as 27.16 ± 5.95 years. More than half (60%) of them had primary infertility, while the rest (40%) had secondary infertility. About half (51.6%) of the women were in the age group of between 25 to 34 years. The second common age group was between 15 to 24 years (34%), followed by those between 35 to 44 year (14.4%). The mean

age of their husbands' was 33.78±6.35 years. A similar percentage (51.6%) husbands were in the age group between 25 to 34 years, but the second commonest age group was between 35 to 44 year (37.0%), followed by those 45 and above (8.0%) (Table1). Observation reveals that the mean age of the husbands was significantly higher than that of the infertile women (p<0.001) (Table.1).

Table 1: Frequency distribution of age group among respondents and their husbands with mean difference

Variable	Group	N (%)	Mean Difference	p-value
Age of respondents	15-24	170 (34)		
	25-34	258(51.6)		
	35-44	72(14.4)		
	≥45	0 (0)		
Total	Mean ±SD	27.16±5.95	33.78-27.16	0.001
Age of husband	15-24	16(3.2)		
	25-34	258(51.6)		
	35-44	186(37.2)		
	≥45	40(8.0)		
Total	Mean ±SD	33.78±6.35		

About one quarter (24%) of our respondents was uneducated, while 32.8% and 42.8% of them had some education and higher education respectively (Table 2). Among the respondents, 80% were housewives and only 20% were employed. Slightly more than half (58.8%) of the husbands were employed (Government 42.4% and Non-government 16.4%), while the remaining (41.2%) were involved in their own business (Table 2).

Most of the respondents (68%) had been trying to conceive for the last 5 years. A smaller number (24%) were infertile between 6 to 10 years, followed by a few with longer duration (0.8%) (Table 2). Nearly all (98.4%) of the women were married only once, and they were currently staying with their husbands. Less than one percentage (0.8%) of these women had successful pregnancy with their previous husbands. On the other hand, most of the husbands (95.2%) were married once, and only 1.2% of them had children from their previous marriage (Table 2).

Table 2: Distribution of the study population according to socio-demographic variables (n= 500)

Variable	Group	N (%)
Educational Status	Illiterate ate	122(24.4)
	<SSC	164(32.8)

	Higher	214(42.8)
Employment status	Housewife	400(80)
	Service	100(20)
Employment status of their husbands	Service	294(58.8)
	Business	206(41.2)
Period of trying to conceive	1-5 years	344(68.8)
	6-10 years	122(24.4)
	11-15 years	30(6)
	16-20 years	4(0.8)
Not the first marriage for respondent	Yes	8(1.6)
	No	492(98.4)
Not the first marriage for husband	Yes	24(4.8)
	No	476(95.2)
Children from previous marriage (respondent)	Yes	4(0.8)
	No	496(99.2)
Children from previous marriage for the husband	Yes	6(1.2)
	No	494(98.8)

Use of fertile period is very important for pregnancy (Fact sheet, 2015; Ecochard *et al.*, 2015). In this study, only 20.4% respondents had knowledge about the fertile period, among these respondents 87 individuals were education (n=102) (Table 3, 4). It was noted that most of the women (82.8%) did not attempt to get pregnant at specific period of their menstrual cycle. In fact, many of them (79.6%) were not aware about the concept of fertile period (Table 3). Only 60% of these women had regular menstrual cycle, and about a third of them (33.6%) were suffering from dysmenorrhea (Table 3).

Table 3: Distribution of infertile women according to medical related problems (n= 500)

Medical related problems		**N (%)**
Knowledge about fertile period	Yes	102 (20.4)
	No	398 (79.6)
Use of fertile period in their menstrual cycle	Yes	86(17.2)
	No	414(82.8)
Regular menstrual cycle	Yes	300(60)
	No	200(40)
Dysmenorrhea	Yes	168(33.6)
	No	332(66.4)
Spouse is a smoker	Yes	140(28)
	No	360(72)
Family history infertility	Yes	32(6.4)
	No	468(93.6)

A notable percentage (28%) of the husbands was smokers. It was also noted that 6.4% of the subjects have family members (including their mothers or sisters) who were also having the

problem with infertility (Table 3). It is well-known that average menstrual cycle is 28 days, and ovulation happens about 14 days before menstrual cycle starts (Fact sheet, 2015; Ecochard *et al.*, 2015). Therefore, association of fertility knowledge and educational status may one of the key factors for infertility. Analysis of data showed that the educational status and the knowledge about fertile period were significantly associated (p<0.001) (Table 4).

Table 4: Association between respondents' education and their knowledge on infertility

Educational Status		Knowledge about fertile period		χ^2- value	p-value
		Yes (n= 102)	No (n= 398)		
Illiterate		15	107		
Educate	<SSC	26	138	16.251	0.001
	Higher	61	153		

DISCUSSION AND CONCLUSIONS

It has been reported that a woman reaches her maximum fertility potential at the age of 30 (Mokhtar et al., 2006). The present study noted that most of the infertile women (51.6%) as well as their husbands (51.6%) were from the age group of 25-34 years. A recent study on polycystic ovarian syndrome (PCOS) among the infertile women has showed that about half (48.1%) of the women were in age group of 21-25 years (Mahdi *et al.*, 2018). More than 60% of the women who were seeking treatment had not been able to conceive for a duration of 1-5 years. A relatively similar finding was reported by another study conducted in Alexandria, Egypt (Mokhtar *et al.*, 2006). If no effective treatment were offered to these women during this period, they would have passed the period of maximum fertility potential, and may have to suffer the long term consequences of this condition. Franks (1995) reported that women with high school education and above in India had markedly higher infertility rate compared to those with only primary or no education. Present data showed that a relatively high percentage (42.8%) of the respondents were highly educated, but it could not be possible for to conclude that level of education was directly associated with infertility or not, because of selection biasness of the sample population. Many women with no or low level of education may not be aware that they can receive advise or treatment for infertility. However, this information would allow to identify potential target population for preventive or remedial measures in future. The association with type of occupational, level of physical requirement and working environment is beyond the scope of this study.

Most of the sample subjects of the study (82.8%) did not attempt to get pregnant at specific period of their menstrual cycle, and same percentage (79.6%) of the subject did not have proper knowledge about the fertile period of the menstrual cycle. This is an interesting finding because basic knowledge on fertile period would increase the chances of getting pregnant, especially for those with regular menstrual cycles. A cross-sectional survey in Pakistan reported that only 54% of their women did not know about fertile period in menstrual cycle (Ali *et al.*, 2011); compared to that data the percentage of ignorant subjects of the present study was much higher (79.6%). It was also noted that only 40% of the respondents had irregular menstrual cycle, indicating that most of them (60%) may benefit from planning to get pregnant according to fertile period. Dutta and Guha (2007) reported that menstrual irregularity among infertile females was 40%, 44.85%, 44.11% in three study areas in India, and which was positively correlated with female infertility. Another study from Iran also reported that 30.1% of their women had menstrual dysfunction (Tehrani *et al.*, 2011). In the present study, about 40 % of the women have menstrual irregularity and 33.6% had dysmenorrhea. They may require further investigation and possibly treatment for these conditions, and ability to conceive would depend on the underlying disease.

The present study showed that 6.4% of women have positive family history of infertility. The incidence of infertility among women with a positive infertility family history among mothers and sister was 24% and 32% respectively (Mandelbaum, 1974). Polycystic Ovarian disease (PCOD) is one of the most common causes of which restrict proper ovulation among infertile women. Patients with PCOD will have multiple cysts in their ovaries that produce excessive amounts of androgens and estrogenic hormones (Franks, 1995). Another common condition that can be associated with infertility is pelvic inflammatory disease (PID), and such women are usually with dysmenorrhea. Most of these conditions can be diagnosed with basic blood investigations, ultrasonography, and occasionally hysterosalpingography. These facilities are generally available in developing countries. Treatment methods vary from trying to get pregnant during the fertile period, to hormonal manipulation. Although some conditions may require advanced imaging modalities and invasive procedures, which are not commonly done in developing countries. It was recognized that men may also be the contributory factor for infertility in the family, but information on this aspect is beyond the scope of the current study.

This study showed that many women with infertility problem in this region can potentially be treated by providing basic education on fertile period as well as menstrual cycle (Table 4). Most of the

subjects willing to seek treatment were among the educated housewives. The relevant authority should provide health education on fertile period related to menstrual cycle to the women who are suffering from infertility, and at the same time should conduct campaign to create awareness on infertility to the working mothers and housewives those are less educated.

Declarations

Ethics approval and consent to participate
We got permission from MICH authority for getting data from PCOS patients, and MICH obtained approval from Rajshahi Civil Surgeon office and Rajshahi City Corporation, Bangladesh for providing support to researcher. Before the interview, we obtained written consent from all the respondents.

Consent to publish
We have taken consent from participants for publication of this study.

Availability of data and material
We do not wish to share our data, because this is primary data and want to use to write another paper using other variables.

Competing interests
All authors declared that there were no conflicts of interests in relation to this study.

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Authors Contributions
SHAM and MGH conceived, and designed this study. FS and SS collected data from Hospital. FS, SS, MN, MGH and SHAM prepared and analyzed the data. FS, SS, MN, AS, MGH and SHAM revised this manuscript. All authors interpreted the data, and approved the final version.

List of abbreviations
BBS: Bangladesh Bureau of Statistics, USA: United State of America; IL: Illinois; RC: Rajshahi City, MICH: Motherland Hospital and Infertility Centre, SPSS: Statistical Package for the Social Sciences, PCOD: Polycystic Ovarian Disease, PID: Pelvic Inflammatory Disease, WHO: World Health Organization, ICMART: International Committee for Monitoring Assisted Reproductive Technology.

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