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FACTORS ASSOCIATED WITH SECONDARY INFERTILITY

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**Abstract**

Infertility is an experience that strikes at the very core of a woman's life and as a whole her family and society. Studies in Bangladesh to evaluate the factors are difficult to come by. This case control study was carried out from Jan 2010 to June 2010 to find out the factors associated with secondary infertility. A total of 70 cases were selected from the infertility unit of Bangabandhu Sheikh Mujib Medical University and 70 unmatched controls from the same hospital attending the pediatrics unit with their children were also recruited. Data were collected by interview and review of documents. No age difference was noticed between the cases ( $29.26 \pm 4.13$ ) and controls ( $29.21 \pm 3.95$ ). Association of secondary infertility was found with body mass index ( $p=0.036$ ), previous bad obstetric history ( $p = 0.011$ ) and previous caesarian delivery ( $p=0.044$ ). Women with secondary infertility were more than four times more likely to have gynecological problem(s) than their fertile counterparts [OR 4.76 with 95% CI (2.018-11.270)]. The factors identified in this study might help the policy makers in designing prevention and health care programmes and thus reducing the hidden burden of secondary infertility.

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**Key Words:** Secondary infertility, factors, association.

**Introduction**

Secondary infertility refers to couples who are unable to conceive after one year of unprotected intercourse after a previous pregnancy in the reproductive age group. Globally, approximately, 10-15% of couples are infertile, affecting more than 80 million people worldwide. Secondary infertility outnumbers primary infertility.<sup>1</sup>

Infertility exerts an enormous toll on both the affected individuals and on society. Couples in their most active and productive years are distracted by the physical, financial and emotional hardships of this disease. For these couples, infertility is more than a disease; it is a devastating life crisis which can greatly affect the couple's general health, marriage, family relationships, job performance and social interactions. Added to the emotional and physical toll exerted by infertility is the financial burden carried by some couples seeking treatment for their disease.<sup>2</sup> Childlessness was found

to result in perceived role failure, with social and emotional consequences for both men and women, and often resulted in social stigmatization of the couple, particularly of the woman. Infertility places women at risk of social and familial displacement, and women clearly bear the greatest burden of infertility.<sup>3</sup>

Either the male or female partners can be responsible for infertility in around 30% cases or both are involved in another 25 to 30% cases. In the remaining 10 to 15% case no cause could be found, which is known as unexplained infertility.<sup>4</sup> Many factors including infectious, environmental, genetic, and even dietary in origin can contribute to infertility. Because of the under reporting of secondary infertility in institution based studies, information on the causes of infertility is likely to consistently underestimate the role of infection, which is the most frequent cause of secondary infertility.<sup>5</sup>

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Incidence of female infertility is growing worldwide and its rate varies from 10 to 20%. Advanced age ( $p < 0.001$ ), elevated body mass index ( $p < 0.001$ ), age at onset of sexual activity ( $p < 0.001$ ), prior pelvic surgeries ( $p < 0.001$ ), and presence of stress ( $p < 0.001$ ) are associated with secondary infertility. There are clinical and demographic risk factors of female infertility.<sup>6</sup>

In western countries, obesity affects approximately half of the general population and is thus a common problem among the infertile population. Obese women have a higher prevalence of infertility compared with their lean counterparts. The majority of women with an ovulatory disorder contributing to their infertility have polycystic ovary syndrome (PCOS) and a significant proportion of women with PCOS are obese. Ovulation disorders and obesity-associated infertility represent a group of infertile couples that are relatively simple to treat.<sup>7</sup>

Recently, the rate of cesarean delivery has increased to 25-30% of all births, the highest rate ever reported in the USA. Primary cesarean deliveries, especially elective procedures, mainly contribute to this increase. One of the issues causing debate is the association between cesarean section and subsequent infertility. Cesarean section has been reported to be associated with decreased subsequent fertility. Recent studies, which have tried to explain this association, suggest that this is most probably voluntary or due to some other biases, or possible confounding factors, which are due to organic or psychosocial effects of an emergency cesarean section or labor preceding the cesarean delivery.<sup>8</sup>

In Bangladesh very little is known about the status of infertility. However, the problem is considered quite prevalent. According to a WHO survey report, infertility rate was found to be 6.9 percent and from BIRPERHT's Reproductive Health Care Need Study (RHCNS), 1996 primary infertility rate was estimated at 3.2 percent and secondary infertility rate was found to be 2.9 percent.<sup>9</sup>

Also little is known about the causes of infertility in Bangladesh. A 14 years data analysis from an infertility clinic shows that about 61% of the cases are without any detectable clinical reason; ovulatory disturbances explained about 30%, and the rest had tubal or other problems. A common cause of infertility of women is the tubal obstruction or pelvic adhesions due to

infectious diseases including sexually transmitted diseases.<sup>9</sup>

Infertility has been relatively neglected as both a health problem and a subject for social science research in South Asia, as well as the developing world. The general thrust of both programmers and research has been on the correlates of high fertility and its relation rather than on understanding the context of infertility, its cause and consequences. Moreover, in pronatalist cultures such as those of India, and South Asia more generally, the consequences of infertility for women can be devastating.<sup>10</sup>

Successful programmes for dealing with infertility in Bangladesh need to include both appropriate and effective sources of treatment at community level and community-based interventions to demystify the causes of infertility, so that people know why infertility occurs in both men and women and where best to seek care.<sup>3</sup> The current study is an approach to find out the factors associated with secondary infertility which might be a basis for the policy makers to design prevention programmes.

## Materials and Methods

This case control study was conducted on 70 cases and 70 unmatched controls for a period of 6 months commencing from January 2010. Women who failed to conceive after 1 year of unprotected intercourse with a history of one previous conception, and coming to the infertility unit of Bangabandhu Sheikh Mujib Medical University (BSMMU) during data collection period, were taken as cases. Women having a second child and attending the pediatric unit of BSMMU for treatment or vaccination of their baby were taken as controls. The cases were selected by purposive sampling.

Consent was taken from the respondents before data collection. Data were collected by face to face interview through a pre-tested questionnaire. Weight and height of the respondents were measured following standard protocol.

Data were cleaned, edited, coded and computed with the help of soft-ware SPSS version 11.5. Quantitative data were analyzed to find out the mean and standard deviation and mean differences were tested by Student's t-test. Qualitative data were analyzed to estimate the proportion and were tested by  $\chi^2$  test. Odds Ratio with 95% confidence interval was estimated.

**Table-1:** Distribution of socio-demographic variables between cases and controls

Characteristics	Cases		Controls		P
	n	%	n	%	
<b>Age in years</b>					
21-25	13	18.6	14	20.0	ns
26-30	31	44.3	35	50.0	
> 30	26	37.1	21	30.0	
mean $\pm$ SD	29.26 $\pm$ 4.134		29.21 $\pm$ 3.952		ns
<b>Religion</b>					
Muslim	63	90.0	66	94.3	ns
Non Muslim	07	10.0	04	5.7	
<b>Educational attainment</b>					
Illiterate	03	4.3	07	10.0	ns
Class I-Class IX	23	32.9	25	35.7	
SSC & HSC	19	27.1	23	32.9	
Graduate and more	25	35.7	15	21.4	
<b>Occupation</b>					
Housewife	41	58.6	48	68.6	ns
Working	29	41.4	22	31.4	

## Results

Although the distribution shows a higher proportion of older age (>30years) respondents in cases (37.1%) than controls (30%), no significant difference was noted in age between cases (29.26  $\pm$  4.13) and controls (29.21  $\pm$  3.95). Most of the respondents were Muslims. There were no significant differences in educational status and occupation between cases and controls (Table-1).

Cases, on average, got married at a later age (20.80  $\pm$  4.70) than the controls (19.89  $\pm$  3.20). Use of hormonal contraception was more common in cases (54.3%) than in controls (48.6%). There was no difference in menstrual hygiene. More than half of the infertile women (55.7%) had poor delivery outcome in their first pregnancy whereas only one third of controls had similar findings (34.3%). Secondary infertile couples were 2.4 times more likely to have a bad obstetric outcome in their previous pregnancy than fertile couples [OR 2.68 with 95% CI (1.01 to 7.12)]. The chance of developing secondary infertility is 2.68 times more with previous caesarian delivery than normal vaginal delivery (Table-2).

To find out the association with secondary infertility, data on pelvic pathology and different major and minor pelvic procedures, such as pelvic surgery, MR, and

**Table-2:** Distribution of reproductive characteristics between cases and controls

Characteristics	Cases		Controls		P	OR
	n	%	n	%		
<b>Age at marriage</b>						
<18	10	14.3	16	22.9	0.083	NS
18-25	47	67.1	49	70.0		
>25	13	18.6	05	7.1		
mean $\pm$ SD	20.80 $\pm$ 4.698		19.89 $\pm$ 3.197		0.180	NS
<b>Hormonal contraception</b>						
Yes	38	54.3	34	48.6	0.306	NS
No	32	45.7	36	51.4		
<b>Menstrual hygiene</b>						
Sanitary napkin	35	50.0	37	52.9	0.735	NS
Others	35	50.0	33	47.9		
<b>Outcome of first pregnancy</b>						
Live birth	31	44.3	46	65.7	0.011	2.68 (1.01-7.12)
Poor outcome	39	55.7	24	34.3		
<b>Mode of delivery in first pregnancy</b>						
Normal vaginal delivery	15	39.5	37	80.4	0.044	2.41 (1.22-4.77)
Caesarean section	23	60.5	09	19.9		

D&C were compared between cases and controls. Association was found between presence of pelvic pathology and secondary infertility ( $p < 0.001$ ). Women with secondary infertility were 4.76 times more likely to have a gynecological problem than their fertile counterparts (Table-3). The gynecological problems included polycystic ovary syndrome, fibroid uterus and others (table not shown). Pelvic surgery and D & C did not show any influence on development of secondary infertility.

**Table-3:** Distribution of pelvic conditions between cases and controls

Characteristics	Type of respondents				P	OR
	Cases		Controls			
	n	%	n	%		
<b>Pelvic pathology</b>						
Present	36	66.7	13	29.5	<0.001	4.76
Absent	18	33.3	31	70.5		(2.018-11.270)
<b>Pelvic surgery</b>						
Caesarian section	13	48.1	07	63.6	<0.386	NS
Others	14	51.9	04	36.4		
<b>D&amp;C</b>						
Yes	22	31.9	13	18.6	<0.079	NS
No	48	68.6	57	81.4		

**Table-4:** Distribution of body mass index between cases and controls

Body Mass Index	Type of respondents				P
	Cases		Control		
	n	%	n	%	
Normal	10	14.3	15	21.4	0.081
Pre obese	31	44.3	30	42.9	
Obese class I	19	27.1	23	32.9	
Obese class II	10	14.3	02	2.9	
mean $\pm$ SD	29.90 $\pm$ 4.58		28.43 $\pm$ 3.57		0.036

Although the distribution was not significantly different, it showed a higher proportion of class II obese in cases (14.3%) than in controls (2.99%). Association was found between body mass index (BMI) and secondary infertility. Cases were, on average, with 1.5 higher BMI than in controls ( $p=0.036$ , Table- 4).

### Discussion

The study was undertaken to gain insight into the problem of infertility. The relationship between secondary infertility and its associated factors is difficult to study. Prospective studies need large cohorts, which are difficult and expensive to follow and have the additional drawback of losing the subjects in the control group. This case control study was carried out in 70 cases and 70 unmatched controls to find out the factors associated with secondary infertility. Although it was not planned, controls matched with cases in relation to age and other socio-demographic variables as no difference was noticed between the two groups. But a previous study found that prevalence of secondary infertility increased with age from 4% in women aged 15-24 years to 17% in those >39 years.<sup>2</sup>

The poor outcome of a previous conception was found to be a risk factor for development of secondary infertility which was also found in other studies.<sup>11</sup> Higher proportion of normal vaginal delivery was more common in controls (80.4%) than in cases (60.5%). Association was found between secondary infertility and mode of delivery in first pregnancy. Other studies also found similar association.<sup>12,13</sup>

Pelvic surgery shows, proportion of caesarian section was more in controls (63.6%) than cases (48.1%). But the number of pelvic surgery was more in cases than

controls. There was no significant difference in pelvic surgery between cases and controls. But in other studies, pelvic surgery was found to be a contributing factor for development of secondary infertility.<sup>13</sup> This difference probably was attributed to differences in sample characteristics.

The study found significant difference in BMI between cases and controls which was consistent with other study findings.<sup>14</sup> The distribution shows higher proportion of obese class II in cases (14.3%) than controls (2.99%).

Detection of any gynecological factors that may be associated with secondary infertility was explored by checking the ultrasonography report. Association was found between abnormal ultrasonogram findings with secondary infertility. Risk of developing secondary infertility was 4.76 times more with abnormal findings in ultra sonogram report than with normal findings. The abnormal finding includes PCOS, fibroid uterus and others. And the distribution shows higher proportion of abnormal findings contributing to PCOS. Association of secondary infertility with PCOS was also found in other studies.<sup>15</sup>

### Conclusion

Caesarian section delivery in previous pregnancy was found to be a risk factor for developing secondary infertility. There is risk of developing secondary infertility with bad obstetrical history in previous pregnancies. As per ultra sonography report it was found that association is present between presence of gynecological problems (polycystic ovary syndrome) and development of secondary infertility. Association was found between increased BMI and secondary infertility.

### References

1. Ali T, Sami N, Khuwaja A. Are unhygienic practices during the menstrual, partum and postpartum periods risk factors for secondary infertility? *J Health Popul Nutr* 2007; **25**(2): 189-194.
2. Safarinejad R. Infertility among couples in a population-based study in Iran: prevalence and associated risk factors. *International Journal of Andrology* 2007; **31**: 303-314.
3. Papreen N, Sharma A, Sabin K, Begum L, Ahsan SK, Baqui AH. Living with infertility: experiences among

- Urban slum populations in Bangladesh. *Bangladesh Health Matters* 2000; **8**(15): 33-44.
4. Chowdhury T. An overview of infertility. *The ORION Medical Journal* 2009; **32**(1): 610-611.
  5. Barbara T. The epidemiology of infertility in Aberdeen Medical Sociology Unit. *Aberdeen Br Med J* 1990; **301**: 148-152.
  6. Romero R, Romero G, Abortes I, Medina G. Risk factors associated to female infertility. *Gynecol Obstet Mex* 2008; **76**(12): 717-721.
  7. Wilkes S, Murdoch E, Alison D. Obesity and female fertility: primary care perspective. *Journal of Family Planning and Reproductive Health Care* 2009; **35**: 181-185.
  8. Afsaneh E, Elter K. The impact of cesarean birth on subsequent fertility. *Curr Opin Obstet Gynecol* 2007; **19**(3): 238-243.
  9. Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERHT), Briefing paper on Assessment of Reproductive Health Care needs and Review of Services provided at the level of Thana, Union and Village, Dhaka, Bangladesh, 1997; **5**: 1-4.
  10. Jejeebhoy E, Shireen J. Infertility in India - levels, patterns and consequences Priorities for social science research. *Journal of Family Welfare* 1998; **44**(2): 15-24.
  11. Tzonou A, Hsieh C, Trichopoulos D, Aravandinos D, Kalandidi A, Margaris D *et al*. Induced abortions, miscarriages, and tobacco smoking as risk factors for secondary infertility. *J Epidemiol Community Health* 1993; **47**(1): 36-39.
  12. Saraswat L, Porter M, Bhattacharya S, Bhattacharya S. Caesarean section and tubal infertility: is there an association? *Reprod Biomed Online* 2008; **17**(2): 259-264.
  13. Homan M, Davies R, Norman: The impact of lifestyle factors on reproductive performance in the general population and those undergoing infertility treatments. *Human Reproduction and Embryology* oxfordjournals.org 2007.
  14. Strobelt N, Mariani E, Ferrari L, Trio D, Tiezzi A, Ghidini A. Fertility after ectopic pregnancy. Effects of surgery and expectant management: *J Reprod Med* 2000; **45**(10): 803-807.
  15. Dewailly S, Hieronimus P, Mirakian N. Polycystic ovary syndrome (PCOS). *D'Endocrinologie* 2010; **71**(1): 8-13.