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Original Research Article

Determinants of risk factors for the development of obstetric fistula in a national fistula centre of a tertiary care medical college hospital

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ABSTRACT

Background: Obstetric fistula is a debilitating condition caused by prolonged, obstructed labor without timely medical care, creating an abnormal opening between the birth canal and bladder or rectum. It remains prevalent in developing regions, particularly South Asia and Africa, due to early marriage, poor maternal healthcare, and lack of skilled birth attendants. In Bangladesh, obstetric fistula is both a medical and social burden, demanding targeted public health interventions. Objectives were to identify the risk factors and patient profile associated with obstetric fistula among women attending the national fistula centre, Dhaka medical college hospital (DMCH), Dhaka, Bangladesh.
Methods: This case-control study was conducted in the department of obstetrics and gynaecology at DMCH from July to December 2010. A total of 50 confirmed obstetric fistula cases were selected using purposive sampling. Data were collected via structured questionnaires and clinical examination. Inclusion and exclusion criteria were strictly followed. Data analysis was done using SPSS software. Ethical approval and informed consent obtained before initiating study.
Results: Among respondents, 34% were aged 31-35 years. In control group, 82% were aged 21-30. Inhabitants: 66% urban in control, 76% rural in case group. Education: 64% control crossed SSC; 42% case were illiterate. Labour pain >24 h in 94% cases. Home trial >24 h in 92% cases. Delivery by Dai: 87.5% in cases. Caesarean section: 58% in cases vs 6% in control. Assisted deliveries: 84.62% in cases.
Conclusions: Early marriage, poor health behavior, malnutrition, and lack of ANC contribute to obstetric fistula, with delayed hospital visits.

Keywords: Obstetric fistula, Early marriage, Malnutrition, Antenatal care, Unskilled birth attendants

INTRODUCTION

Obstetric fistula (or vaginal fistula) is a severe medical condition in which a fistula (abnormal tract) develops between either the urinary tract and vagina or between the rectum and vagina after severe or failed childbirth, when adequate medical care is not available.[1] The oldest evidence of obstetric fistula can be found in the remains of an Egyptian Queen's mummy from around 1150 BC. Obstetric fistula was very common throughout the entire world but virtually disappeared within Europe and North America due to improvements in obstetrical care. To this

day, the prevalence of obstetrical fistula is much lower in places that discourage early marriage, encourage and provide education of women, and grant women access to family planning and skilled medical teams to assist during childbirth. This condition is still very prevalent in the developing world, especially in parts of Africa and much of South Asia (Bangladesh, Afghanistan, Pakistan, and Nepal). The 2005 demographic health survey (DHS) in Ethiopia national prevalence of obstetric fistula being 1% of ever-married women.[2] According to the world health organization (WHO), an estimated 50,000 to 100,000 women develop obstetric fistulas each year and over two million women currently live with fistula injuries. Other reports stated that of one million reside in Northern Nigeria and over 70,000 (seventy thousand) in Bangladesh. While iatrogenic damage during gynaecological surgeries is the commonest factor in developed countries. In countries like Bangladesh, obstetric fistula is not only a medical issue but also a profound social problem that isolates women from their families and communities.[3] Early marriage and childbirth, common in many parts of South Asia, are major contributors to the development of obstetric fistula.[4] Young girls, whose pelvic bones are not fully developed, face increased risk during childbirth.[5] Inadequate access to antenatal care (ANC) and skilled birth attendance further exacerbates the problem.[6] In rural Bangladesh, the delays in accessing emergency obstetric care are often linked to poverty, illiteracy, and lack of transportation.[7] Studies from sub-Saharan Africa and South Asia have consistently shown that socio-economic determinants-like low education, poverty, early marriage, and rural residence-are closely associated with increased fistula risk.[8,9] Traditional practices and reliance on untrained birth attendants also heighten the risk.[10] According to the WHO, over 2 million women live with untreated obstetric fistula globally, with over 50,000 to 100,000 new cases annually.[11] In Bangladesh, data on the specific risk determinants among patients treated at the national fistula centre at Dhaka medical college hospital (DMCH) remain limited. Evaluating these risk factors is essential for designing preventive measures, improving maternal healthcare accessibility, and raising community awareness.[12] Despite increasing institutional delivery rates, deep-rooted socio-cultural factors continue to challenge fistula prevention efforts.[13] Moreover, the physical, emotional, and economic burdens borne by women suffering from this condition cannot be overstated.[14] Social stigma, divorce, and loss of income contribute to lifelong consequences if not addressed early through proper care and rehabilitation.[15]

This study aims to identify the underlying determinants of obstetric fistula in patients attending the national fistula centre of DMCH to inform public health strategies and ensure more targeted interventions.

Objectives

General objective

General objective was t**o** identify and assess the risk factors leading to the development of obstetric fistula in women.

Specific objectives

Specific objectives were to identify common obstetric, socio-economic, and demographic risk factors, to evaluate the clinical and personal profile of affected patients, to assess the role of ANC and cultural practices in fistula development, to explore delays in seeking medical care during pregnancy and labor and to recommend strategies for reducing obstetric fistula and improving maternal health outcomes.

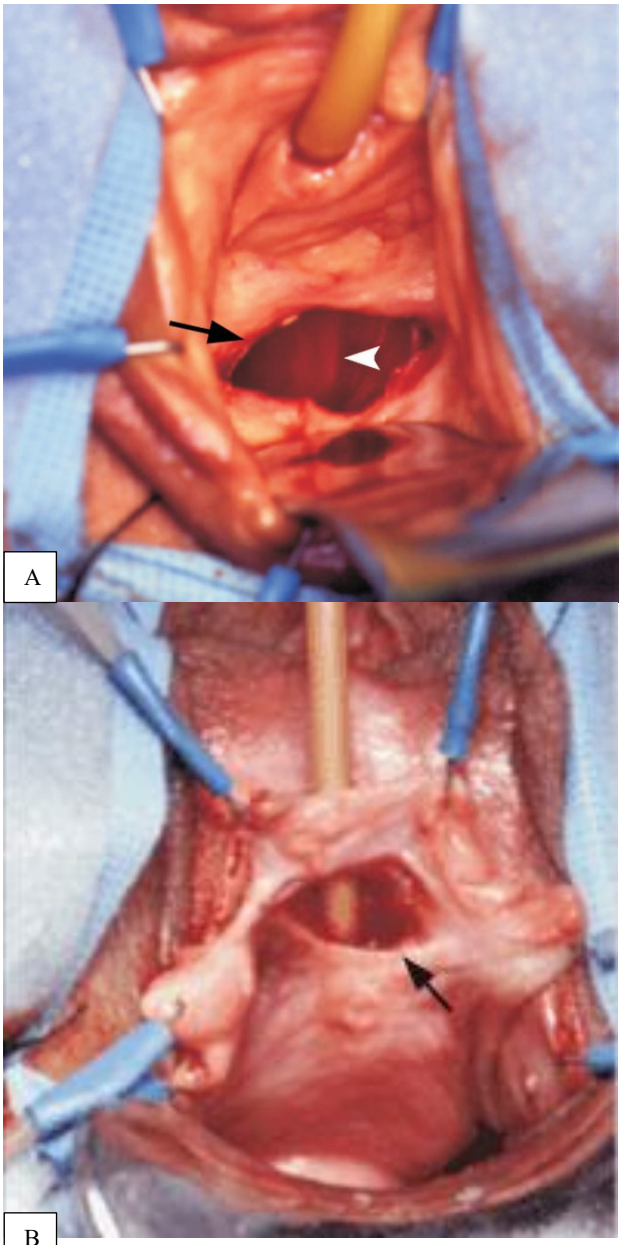

Figure 1 (A and B): Vesicovaginal fistula (inspection).

METHODS

Study design

This study employed a case-control design aimed at identifying and evaluating the risk factors associated with

obstetric fistula. The research was conducted in the department of obstetrics and gynaecology at Dhaka medical college hospital (DMCH), Dhaka, Bangladesh. The study spanned a six-month period, from July 2010 to December 2010.

Study population

The study population comprised women who were either admitted to the hospital or visited the outpatient department (OPD) with a confirmed diagnosis of obstetric fistula. These patients presented with urinary or fecal incontinence as a result of genital tract injury sustained during labor.

Sample size

A total of 50 cases were included in the study. The sample size was determined based on the availability of eligible patients diagnosed with obstetric fistula during the designated study period.

Sampling frame and technique

A purposive or convenience sampling technique was employed for participant selection. This non-probability method allowed for the inclusion of all accessible patients who met the inclusion criteria within the study timeframe, ensuring the relevance of the collected data to the study objectives.

Inclusion criteria

Participants were included if they had a clinically confirmed diagnosis of urinary or fecal incontinence resulting from genital tract trauma sustained during labor. Only those willing to participate and provide informed consent were enrolled in the study.

Exclusion criteria

Patients were excluded if their urinary incontinence was caused by iatrogenic genitourinary fistulas (such as surgical injury) or if their fecal incontinence resulted from causes unrelated to childbirth. Individuals who declined to participate were also excluded.

Study procedure

Eligible participants were identified based on clinical records and presenting complaints. Each patient was approached individually, and the purpose of the study was explained in detail. Informed written consent was obtained prior to inclusion. Each participant was interviewed using a structured questionnaire. The questionnaire was designed to collect comprehensive information, including sociodemographic characteristics (such as age, residence, education, and socioeconomic status), obstetric history (parity, place and mode of delivery, duration of labor, and presence of skilled birth attendants), medical background, and details related to the development of the fistula.

Following the interview, a clinical examination was conducted to confirm the diagnosis and assess the condition's severity. Findings from the history and examination were systematically recorded on a pre-designed data sheet. In select cases, additional diagnostic methods such as dye tests were utilized to support clinical findings.

Method of data collection

All interviews and examinations were conducted by the principal investigator to ensure consistency. Data were recorded immediately after each interaction using structured forms. The questionnaire and examination sheet were pre-tested and standardized for this study to ensure accuracy and completeness.

Data analysis and processing

Collected data were compiled and analyzed using SPSS (statistical package for social sciences) software, version 16.0. Descriptive statistics, such as mean, standard deviation, frequencies, and percentages, were used to summarize the characteristics of the study population. Inferential statistical analyses, including chi-square tests and logistic regression, were applied to identify significant associations between risk factors and the development of obstetric fistula. A p value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethical approval for the study was obtained from the institutional review board of Dhaka medical college. All participants were informed about the study's purpose, potential benefits, risks, and their rights as participants. Informed written consent was obtained from each participant. All collected data were kept confidential, and the privacy of participants was protected throughout the study in accordance with ethical research guidelines.

RESULTS

Table 1 shows the distribution of respondents by age at the time of treatment. Among the case group, 10% were aged 15-20 years, 10% were 21-25 years, 14% were 26-30 years, 34% were 31-35 years, 24% were 36-40 years, and 8% were over 40 years. In the control group, most (82%) were aged 21-30 years. Regarding residence, 76% of the case group lived in rural areas, while 66% of the control group lived in urban areas. Education levels varied, with 64% of the control group having completed SSC, while 42% of the case group were illiterate. Employment status also differed: 66% of the control group were housewives, 28% were employed, while 78% of the case group were housewives, with no one engaged in service or business.

Table 1: Distribution of respondents by their age at present when they have included for study.

Variables	Control, (n=50)		Case, (n=50)	
	N	%	N	%
Age group of respondents (in year)				
<15	0	00	0	00
15-20	7	14	5	10
21-25	21	42	5	10
26-30	18	36	7	14
31-35	3	06	17	34
36-40	1	02	12	24
>40	0	00	4	08
Inhabitant				
Rural	17	34	38	76
Semi-urban	14	28	11	22
Urban	19	38	1	02
Education level of respondents				
Illiterate	1	02	21	42
Only can signature	3	06	13	26
Primary level	7	14	12	24
Upto class VIII	7	14	8	16
Upto SSC	19	38	0	00
HSC or more	13	26	0	00
Occupation				
House wife	33	66	39	78
Day laborer	00	00	5	10
House keeper (Bua)	03	06	6	12
Service	10	20	0	00
Business	04	08	0	00

Table 2: Distribution of respondents by their age during development of disease.

Age groups of respondents during development of disease (in year)	Control, (n=50)		Case, (n=50)	
	N	%	N	%
<15	0	00	2	04
15-20	0	00	24	48
21-25	0	00	17	34
26-30	0	00	4	08
31-35	0	00	2	04
36-40	0	00	1	02
>40	0	00	0	00
Total	00	00	50	100

Table 2 shows the distribution of respondents by their age during development of disease. Among them 04% were within <15 years, 48% were 15-20 years, 34% were 21-25 years, 08% were 26-30 years, 04% were 31-35 years and 02% were 36-40 years.

Figure 2 presents among them 40% were <19, 44% were within ≥19-21, 12% were >21-24 and 04% were >24. Whether in control 78% were within 19-24 that's mean majority within normal range.

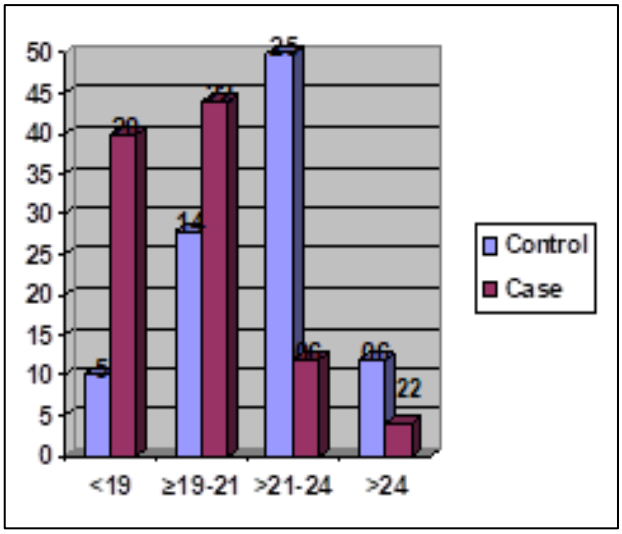

Figure 2: Distribution of respondents by their BMI.

Table 3: Distribution of respondents by age at first marriage.

Age at first marriage (in year)	Control, (n=50)		Case, (n=50)	
	N	%	N	%
<15	1	02	11	22
15-18	9	18	29	58
>18-20	19	38	7	14
>20	21	42	3	6
Total	50	100	50	100

Table 3 shows distribution of respondents' age at first marriage. Control group show 02% had got married in under 15 years of age, 18% within 15-18 years, 38% within >18-20 and 42% had got married after 20 years of age. Study group show 22% had got married <15 years of age, 58% had got married within 15-18 years, 14% had got married within 18-20 years and only 6% had got married >20 years of age.

Table 4: Distribution of respondents by reason for not receiving complete antenatal checkup.

Reason for not receiving complete antenatal checkup	Control, (n=28)		Case, (n=50)	
	N	%	N	%
No money	14	50	21	42
Husband's side disagree	3	10.71	7	14
Need not to go	0	00	5	10
Don't know to go to doctor	0	00	7	14
Did not get sick/ always felt well	5	17.88	5	10
Due to previous normal delivery	6	21.42	0	00
Religious causes	0	00	5	10
Total	28	100	50	100

Table 4 shows respondents' reasons for not receiving antenatal checkup. In control group 50% due to no money, 10.71% due to husband's side disagree, 17.88% did not get sick 21.42% due to previous normal delivery. Among case group 42% stated that they did not receive antenatal checkup due to no money, 14% for husband's side disagree, 10% stated that they did not receive antenatal checkup because they think need not to go hospital, 10% always felt well, 14% don't know to go to doctor, 10% stated that they did not receive antenatal checkup due to religious back ground.

Table 5: Distribution of respondents by duration of labour pain and trying at home.

Duration of labour pain (hours)	Control, (n=50)		Case, (n=50)	
	N	%	N	%
≤12	41	82	0	00
>12-24	9	18	03	06
>24	0	00	47	94

Table 5 shows the duration of labor pain among respondents. In the control group, 82% experienced labor pain for less than 12 hours and 18% for 12-24 hours, with none exceeding 24 hours.

Table 6: Distribution of respondents for not coming or very late to the hospital during labour pain.

Reason for not coming or very late to the hospital for delivery	Control, (n=50)		Case, (n=50)	
	N	%	N	%
Financial problem	9	56.25	20	40
Dai prevent	5	31.25	7	14
Do not feel necessary	0	00	10	20
For religious purpose	0	00	2	04
Husband disagrees	1	6.25	5	10
Mother-in-law disagree	0	00	1	02
Transport problem	1	6.25	4	08
No one say to go there	0	00	1	02
Total	16	100	50	100

Table 6 shows reasons for not coming or delayed arrival at the hospital for delivery. In the control group, 56.25% cited financial problems, 31.25% embargo from Dai, 6.25% husband's disagreement, and 6.25% transport issues. In the case group, 40% reported financial problems, followed by Dai restriction (14%), lack of perceived need (20%), religious reasons (4%), family disagreement (12%), transport issues (8%), and lack of family support (2%).

Table 7: Distribution of respondents by distance of nearest hospital from home with EOC facilities mode of delivery.

Variables		Control, (n=50)		Case, (n=50)	
		N	%	N	%
Distance of nearest hospital from home with EOC facilities (km)					
≤03		23	46	0	00
>03-10		19	38	3	06
>10-20		8	16	11	22
>20		0	00	36	72
Mode of delivery		50	100	50	100
At hospital	By C-section	3	06	29	
	Vaginal	38	76	13	
At home vaginal delivery		9	18	8	16

Table 7 shows distribution of respondents by distance of nearest hospital from home with EOC facilities. Control group showed that about 84% lived within 10 km. Whether 72% lived in a far distance, more than 20 km. In control group 06% by caesarean section, 76% by NVD in the hospital and 18% by NVD at home. Case group showed that 58% delivered by caesarean section in hospital, 26% by vaginal delivery in hospital and 16% by vaginal delivery at home.

Table 8: Distribution of respondents who were under gone assisted vaginal delivery or destructive operations.

Assisted vaginal delivery or destructive operations	Control, (n=50)		Case, (n=50)	
	N	%	N	%
Assisted vaginal delivery	0	00	11	84.62
Destructive operations	0	00	2	15.38
Total	00	00	13	100

Table 8 shows distribution of respondents who were under gone assisted vaginal delivery or destructive operations. Control groups not under gone to assisted vaginal delivery or destructive operations. Among case groups 13 patients had under gone such procedure. Out of them 84.62% had to needed assisted vaginal delivery and 15.38% had to needed destructive operations.

DISCUSSION

The present study reveals that the majority of women in the case group were between the ages of 31-35 years, whereas most in the control group were between 21-30 years. This suggests that delayed maternal age might be associated with higher maternal complications. A study by

Akinola et al in Nigeria also found that women aged above 30 years had a higher likelihood of experiencing obstetric complications compared to younger women.[16] The inhabitant distribution showed that most of the case group lived in rural areas (76%), whereas most of the control group lived in urban areas (66%). This urban-rural disparity in maternal health access and outcomes is a well-known phenomenon. Research by Garenne and Joseph in rural Burkina Faso also found rural residence to be a significant factor contributing to delayed hospital delivery and poor maternal outcomes.[17] Educational levels were also significantly lower in the case group, with 42% being illiterate. Education is known to play a pivotal role in improving maternal health-seeking behavior. A study in Nepal showed that women with higher education were more likely to seek ANC and institutional deliveries.[18] Occupational status revealed that most case group women were housewives (78%) or engaged in laborious domestic work, while a significant portion of the control group was employed. Employment contributes to financial autonomy and health awareness. In agreement, Babalola and Fatusi found employment status significantly associated with institutional delivery in sub-Saharan Africa.[19] Age at first marriage showed a concerning trend, with 22% of women in the case group marrying before the age of 15. Early marriage increases the risk of early and repeated childbirth, which is associated with adverse maternal outcomes. Raj et al found that child marriage is significantly linked to poor maternal health service utilization and increased maternal morbidity.[20] Among reasons for not attending antenatal checkups, poverty, ignorance, and religious beliefs were dominant. Similar findings were reported in a study in Pakistan where lack of awareness, poverty and family restrictions were the major barriers to ANC.[21] Labour pain duration was significantly longer in the case group, with 94% experiencing more than 24 hours of labour. Prolonged labour has been associated with increased maternal and fetal risks. In a study by Mathai et al prolonged and obstructed labour was among the major causes of maternal mortality in developing nations.[22] Home trials were longer in the case group, and delivery was often attended by untrained persons. Only 10% in the case group were attended by a nurse or skilled attendant. In contrast, trained personnel in the control group greatly reduced the risk of complications. This is corroborated by a study from Ethiopia where home births with unskilled attendants significantly increased maternal mortality.[23] Regarding institutional delivery, 92.86% of the case group were eventually delivered by doctors after severe complications developed. However, many of these deliveries required caesarean sections (58%) or even destructive operations. A study in India supports this, showing increased surgical intervention rates in patients who had delayed hospital admission after failed home delivery.[24] Lastly, the major reason for delayed hospital arrival included financial hardship, lack of transport, and misinformation from traditional birth attendants (dais). Similar findings were reported by Gabrysch et al in Ghana, where such socio-cultural and economic factors played a dominant role in delayed facility-based care.[25]

Limitations

This study has several limitations that should be considered. It was conducted at a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings to the wider population. Use of purposive sampling rather than random sampling may have introduced selection bias. Data were collected through interviews and patient recall, which may be subject to recall bias and inaccuracies. Moreover, important socioeconomic and cultural determinants not thoroughly explored due to time and resource constraints.

CONCLUSION

The conclusions of the study are: 80% of women married below 18 years. 86% obstetric fistula developed within age range of 15-25 years, unfortunately more than 60% of them developed within 20 years. 82% were primipara, 40% malnourished (BMI<19), 42% illiterate, most of them came from poor socio-economic condition, poor health seeking behavior, a tendency of not using/delayed use health facilities, early marriage, low social status of women and girl child are also contributing significantly in development of obstetric fistula. 58% women were not taken ANC. Rest of the women were taken ANC by various unskilled physician, practiced in our community like rural medical practitioners (RMP), homoeopathist etc. 100% cases gave home trial and ultimately 84% cases came to hospital after giving home trial for more than 24 hours by untrained birth attendant.

Recommendations

Obstetric fistula is largely preventable, yet over 416,000 women in Bangladesh are living with this condition. Based on the study findings, several preventive measures are recommended. Early marriage and childbirth should be discouraged through education and enforcement of relevant laws. Efforts must be made to improve women's literacy, socioeconomic conditions, and awareness about the importance of ANC and pregnancy complications. Expectant mothers should receive proper counseling, and healthcare providers must ensure accessible and quality ANC services. Additionally, traditional birth attendants and family welfare visitors, who provide most rural maternity care, should be adequately trained to identify high-risk pregnancies and ensure timely referral for skilled medical intervention.

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