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Original Research Article

Prevalence and determinants of cesarean section in a rural tertiary care hospital of Bangladesh

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ABSTRACT

Background: Cesarean section (CS) stands as the foremost major surgical procedure in contemporary obstetrics. Initially developed primarily to safeguard maternal life during challenging childbirth scenarios, its prevalence has shown a concerning upward trajectory in recent times. The aim of this study was to investigate the prevalence and determinants of Cesarean section deliveries in a rural tertiary care hospital.
Methods: This was a retrospective observational study and was conducted in the Department of Obstetrics and Gynaecology of Khwaja Yunus Ali Medical College & Hospital, Sirajganj, Bangladesh during the period from January 2018 to December 2019.
Results: Out of a total of 1600 deliveries, 390 (24.4%) were vaginal deliveries, while 1210 (75.6%) were cesarean sections respectively. Majority 94.8% patients were 20-34 years old, 1.8% were less than or equal to 19 years and 3.4% were great than or equal to 35 years old respectively. The majority of cesarean sections, 814 (67.3%), were performed as elective procedures and 396 (32.7%) were performed as emergency procedures respectively. Majority 512 (42.3%) were performed on women who had a history of previous cesarean deliveries, 34 (2.8%) were performed due to non-progression or prolonged labor, 99 (8.2%) were performed due to malpresentation of the baby and 308 (25.5%) were performed at the request of the mother respectively.
Conclusions: In conclusion, this retrospective observational study provides valuable insights into the prevalence and determinants of caesarean sections in a rural tertiary care hospital.

Keywords: Caesarean section rate, Determinants, Indications, Prevalence, Repeat cesarean section

INTRODUCTION

Caesarean section (CS) stands as the foremost major surgical procedure in contemporary obstetrics.[1] Initially developed primarily to safeguard maternal life during challenging childbirth scenarios, its prevalence has shown a concerning upward trajectory in recent times.[2] This increase in caesarean deliveries is observed worldwide, spanning both developed and developing nations, with a noticeable rise evident in both primary and repeat caesarean rates.[3,4] The rising trend in both primary and repeat caesarean rates is attributed to a variety of factors. These include heightened awareness of fetal distress, particularly with the aid of continuous electronic fetal monitoring, a more lenient approach towards performing caesarean sections for breech presentation, opting for abdominal delivery for growth-restricted infants, delayed childbearing, higher maternal body mass, multiple

pregnancies, premature births, and enhanced safety associated with caesarean procedures.[5] Childbirth, a pivotal event in the human experience, is meant to be a natural process heralding new life into the world. However, over recent decades, there has been a notable global rise in Caesarean section (C-section) rates, altering the landscape of obstetric care and prompting scrutiny into the factors driving this phenomenon.[6,7] While the recommended global average for CS rates stands at approximately 15%, significant regional disparities exist. For example, rates are as low as 3.5% in Africa and as high as 40.5% in Eastern Asia.[8] Moreover, CS rates exhibit variations based on factors such as country, regions within a country, facility type (private versus public), and the qualifications and specialties of caregivers.[9] Many countries have witnessed a notable surge in CS rates in recent years, particularly in rural areas. In China, for instance, the CS rate surged from 3% to 39% between 1988 and 2008, with the most rapid increase observed among rural, economically disadvantaged, and less educated women.[10] These challenges can significantly impact the prevalence and determinants of C-sections in such regions, shaping maternal health outcomes and healthcare practices.[11,12] The focus of this retrospective study is to investigate the prevalence and determinants of C-section in a rural tertiary care hospital, delving into the multifaceted factors that contribute to the decision-making process surrounding mode of delivery in this specific context. Over the years, the global CS rates have markedly risen, escalating from approximately 7% in 1990 to the current rate of 21%. This exceeds the ideal recommended CS rate, which falls within the range of 10% to 15%, as outlined by the World Health Organization (WHO).[13] In rural settings, access to obstetric care can be compromised by geographical remoteness, inadequate transportation infrastructure, and limited availability of healthcare facilities. These challenges often result in delayed presentation for antenatal care, reduced access to skilled birth attendants, and increased reliance on emergency obstetric interventions such as C-sections.[14] Moreover, cultural beliefs, socioeconomic status, and healthcare-seeking behaviours of rural populations further shape their preferences and decisions regarding childbirth, impacting the mode of delivery chosen.[15] The determinants of C-sections in rural areas are multifaceted and interconnected. Maternal factors such as age, parity, preexisting medical conditions, and obstetric history play a significant role in decision-making regarding mode of delivery.[11,16] Conversely, advanced maternal age and multiparity may also influence the likelihood of C-section, reflecting both maternal and fetal considerations.[17] Socioeconomic factors, including income level, education, and health insurance coverage, can also impact access to obstetric care and the likelihood of undergoing a C-section. Women from lower socioeconomic backgrounds may face barriers to accessing timely prenatal care and may present with higher rates of obstetric complications, leading to increased C-section rates.[18] Women with higher socioeconomic status may have greater access to private healthcare facilities and elective C-sections, potentially contributing to disparities in C-section rates based on income and education levels.[19]

The objective of the study was to investigate the prevalence and determinants of caesarean section deliveries in a rural tertiary care hospital.

METHODS

This was a retrospective observational study and was conducted in the Department of Obstetrics and Gynaecology of Khwaja Yunus Ali Medical College and Hospital, Sirajganj, Bangladesh during the period from January 2018 to December 2019. Data were collected from medical records and archives of deliveries conducted at the hospital over a specified period. Deliveries with incomplete or missing records were excluded from the analysis.

Data collection

Findings of observation and interview with the patient and attendants were recorded on prescribed data collection sheet that was fulfilled by the investigator. Data were retrieved from electronic medical records, delivery registers, and obstetric databases maintained by the hospital. Information pertaining to mode of delivery, maternal demographics, obstetric history, indications for caesarean sections, and other relevant variables were extracted.

Quality control

Regular audits and checks were conducted to ensure the accuracy and completeness of the collected data. Any discrepancies or inconsistencies were resolved through consultation with senior obstetricians and review of original medical records.

Prior to commencement of the study, the respective authority was approved the research protocol. All the patients included in this study were informed about the nature, risks and benefits of the study. Confidentiality was maintained. Proper permission was taken from the department and institution concerned for the study.

Statistical analysis

After collection of data, all data were compiled in a master table first. Data was processed and analyzed using SPSS (22) for windows software. Qualitative data presented on categorical scale was expressed as frequency and corresponding percentage.

RESULTS

Figure 1 presents the distribution of study patients by the incidence of cesarean section in the rural tertiary care hospital. It indicates that out of a total of 1600 deliveries,

390 (24.4%) were vaginal deliveries, while 1210 (75.6%) were cesarean sections respectively.

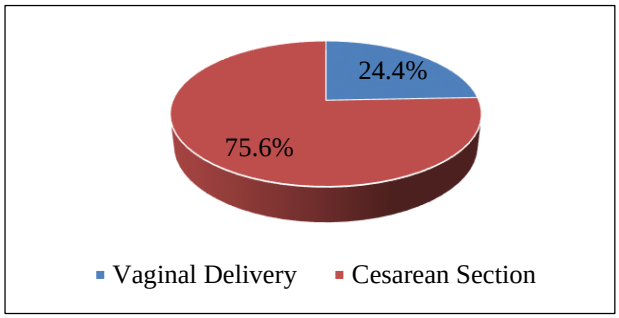

Figure 1: Distribution of our study patients by the incidence of caesarean section.

Table 1 illustrates the age distribution of women undergoing cesarean sections in the rural tertiary care hospital. Majority 94.8% patients were 20-34 years old, 1.8% were less than or equal to 19 years and 3.4% were great than or equal to 35 years old respectively.

Table 1: Age distribution of women undergoing caesarean sections.

Age	N	Percent
≤19	22	1.8
20 - 34	1147	94.8
≥ 35	41	3.4
Total	1210	100

Table 2 indicates that a higher proportion of cesarean sections were performed on multigravidas women compared to primigravidas women in the rural tertiary care hospital. The majority of cesarean sections, 767 (63.4%), were performed on women who had previously experienced pregnancies (multigravida). Out of the total cesarean sections, 443 (36.6%) were performed on women who were experiencing their first pregnancy (primigravida).

Table 2: Rate of caesarean sections according to gravida.

Gravida	N	Percent
Primigravida	443	36.6
Multigravida	767	63.4
Total	1210	100

Table 3 reveals that a significant proportion of cesarean sections were elective rather than emergency procedures in the rural tertiary care hospital. The majority of cesarean sections, 814 (67.3%), were performed as elective procedures and 396 (32.7%) were performed as emergency procedures respectively.

Table 4 provides insight into the various indications for cesarean sections. Majority 512 (42.3%) were performed on women who had a history of previous cesarean deliveries, indicating a high rate of repeat cesarean sections, 133 (11.0%) were performed due to fetal distress, 34 (2.8%) were performed due to non-progression or prolonged labor, 99 (8.2%) were performed due to malpresentation of the baby, 22 (1.8%) were performed due to placenta previa, 66 (5.5%) were performed due to maternal health conditions, 308 (25.5%) were performed at the request of the mother, 31 (2.6%) were performed for pregnancies involving more than one fetus (twins, triplets, etc.) respectively.

Table 3: Rate of caesarean sections according to emergency.

Type of CS	N	Percent
Emergency CS	396	32.7
Elective CS	814	67.3
Total	1210	100

Table 4: Distribution of caesarean sections by indication.

Indication	N	%
Fetal distress	133	11.0
Non progression/prolonged labour	34	2.8
Malpresentation	99	8.2
Placenta previa	22	1.8
Abruptio placentae	11	0.9
Maternal indication (HTN, severe pre-eclampsia, diabetic)	66	5.5
Previous CS	512	42.3
Post dated	33	2.7
Maternal request	308	25.5
Multiple pregnancy	31	2.6

DISCUSSION

The findings of this retrospective observational study shed light on the prevalence and determinants of CS in a rural tertiary care hospital. The discussion will explore the implications of these findings in the context of existing literature, comparing and contrasting with other relevant studies to provide a comprehensive understanding of CS practices in diverse settings.

The prevalence of CS observed in this study (75.6%) aligns with global trends showing an increasing rate of CS deliveries worldwide. In a similar study Khan et al shows CS rates increased from 3.5% in 2004 to 23% in 2014.[20] In 2014 around 18% of the world's births were delivered by CS.[21] The highest rate of CS (32%) was reported in Latin America and the Caribbean region, while the African region reported the lowest rate (7%).[21] According to Betrán et al, the global CS rate has surpassed the WHO recommended threshold, with both developed and developing countries experiencing a rise in CS rates.[6] Our findings corroborate this trend, highlighting the substantial burden of CS deliveries even in rural settings. While CS

rates tend to be lower in rural areas compared to urban centers, our study demonstrates that CS remains the predominant mode of delivery in this rural tertiary care hospital. As this Hospital is a tertiary care hospital more complicated cases are referred from surrounding hospitals, clinics and remote areas and delivered by caesarean section. This contrasts with findings from urban hospitals where CS rates may be even higher due to factors such as increased access to healthcare facilities, higher rates of elective CS, and patient preferences.[8,22] Despite differences in access to obstetric care, the rising CS rates in both rural and urban settings underscore the need for comprehensive strategies to address CS overuse.[23]

Our study identified several determinants associated with CS deliveries, including maternal age, previous CS, fetal distress, and maternal request. These findings are consistent with previous research highlighting the multifactorial nature of CS determinants. For instance, advanced maternal age has been consistently associated with higher CS rates due to increased risks of obstetric complications.[11] Similarly, previous CS is a well-established predictor of repeat CS deliveries, contributing to the rising trend of CS rates globally.[12] Comparing our findings with other studies conducted in similar settings can provide valuable insights into regional variations in CS practices and their determinants. For example, a study by Sharma et al in rural India reported lower CS rates but highlighted disparities in access to emergency obstetric care, resulting in adverse maternal outcomes.[23] By contrast, our study found a higher prevalence of CS, underscoring the complex interplay of socio demographic, clinical, and healthcare system factors influencing CS practices in different rural contexts.

Examining the indications for CS deliveries in our study reveals a diverse range of clinical reasons, including fetal distress, previous CS, and maternal request. These findings echo those of other studies reporting variations in CS indications based on regional practices and healthcare provider preferences.[14] Notably, the high proportion of CS performed due to maternal request underscores the need for patient-centred care approaches that involve shared decision-making and informed consent.[15,24] The high prevalence of CS observed in our study raises concerns about its potential impact on maternal health outcomes. While CS can be a life-saving intervention when medically indicated, its overuse has been associated with increased risks of maternal morbidity and mortality.[14,25] Addressing the determinants driving CS deliveries, such as previous CS and maternal request, is crucial for optimizing maternal health outcomes and reducing unnecessary interventions.

Several limitations of our study warrant consideration. Firstly, the retrospective design may be susceptible to biases inherent in secondary data analysis, including information bias and selection bias. Additionally, the study was conducted at a single rural tertiary care hospital, limiting the generalizability of findings to other rural settings. Future research should aim to overcome these limitations by employing prospective study designs and multicentre collaborations to provide more robust evidence on CS practices in rural areas. Efforts should be made to improve access to obstetric care services, particularly in rural areas where access barriers may exist. Antenatal care providers should offer comprehensive education and counselling to pregnant women regarding the risks and benefits of caesarean section versus vaginal delivery. Strategies to prevent or manage maternal health conditions such as hypertensive disorders, gestational diabetes, and obesity should be prioritized to reduce the need for caesarean sections related to maternal indications.

CONCLUSION

In conclusion, this retrospective observational study provides valuable insights into the prevalence and determinants of caesarean sections in a rural tertiary care hospital. Our findings highlight the significant burden of CS deliveries in the rural setting, with CS rates surpassing global thresholds. Maternal age, previous CS, fetal distress, and maternal request were identified as key determinants associated with CS deliveries, underscoring the multifactorial nature of CS practices. Comparison with existing literature reveals similarities and disparities in CS practices across different settings, emphasizing the need for context-specific interventions to optimize obstetric care. While CS can be a life-saving intervention when medically indicated, its overuse may pose risks to maternal and neonatal health outcomes. Addressing the determinants driving CS deliveries, promoting evidence-based practices, and supporting patient-centred care approaches are crucial steps towards ensuring safe and equitable childbirth practices.

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