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Caesarean Section at a Selected Tertiary Hospital in Dhaka: Indications and Feto-Maternal Consequences

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Abstract

Background: Cesarean section (CS) delivery has substantially increased globally over the past few decades. Unnecessary C-sections can cause infections, excessive bleeding and various health complications for mothers and babies. In Bangladesh, more than 860,000 C-sections per year are medically unnecessary.

Objectives: To determine the indications along with fetal and maternal consequences of CS deliveries.

Methods: A cross-sectional study was conducted in paying wards in the Department of Gynaecology and Obstetrics of a selected tertiary level hospital in Bangladesh. A sum of 306 patients were recruited to be a part of this study. Medical documents were used as sources of data and face-to-face interviews were conducted. Descriptive analysis was performed.

Results: Mean age was 26.35 ± 5.08 years; 58.5% were multiparous; mean duration of current pregnancy was 35.89 ± 4.23 weeks; 85% deliveries were performed by CS; indications revealed 26.3% cases for less fetal movement and 12.9% for history of previous caesarean section; 91.5% babies were live births; mean birth weight was 2.82 ± 0.53 kg, APGAR scoring at 5th minute was good for 95% fetuses; maternal condition during discharge was stable in 93.1% cases and mean length of hospital stay was 4.30 ± 1.83 days.

Conclusion: It can be suggested that the health authorities should formulate specialized programs and spread awareness about the ill effects of caesarean deliveries. The authorities should provide awareness to pregnant women on every comprehensive checkup about the pros and cons of C-section delivery and how to maintain good physical health throughout their pregnancy period.

Keywords: C-section, Indications for Caesarean Section, Fetal Outcomes, Maternal Mortality, Delivery, Birth, Dhaka

Introduction

A caesarean section (CS), often referred to as C-section or caesarean birth, is a surgical procedure involving an incision into the mother's abdomen and uterus for delivery, typically recommended when labor progress is impaired by maternal or fetal factors [1]. A range of elements are likely to be associated with CS which include higher prevalence of medical indications for CS (maternal age, obesity, multiple gestation, diabetes, and hypertension/preeclampsia), higher access to modern health care services, mothers' education, place of residence, wealth index, mothers' age, age at marriage, age at first birth, parity, birth order, antenatal visit, husband occupation, delivery in the private sector, religion, geographical region, changes in cultural and social factors and supply induced demand for CS [2]. Despite CS being an essential mode of delivery, which lowers the risks associated with childbirth, the rising figures in this context is alarming. When there are realistic indications, World Health Organization states that it must be performed; inability to conduct CS may lead to perinatal asphyxia, stillbirth, uterine rupture,

obstetric fistula, resulting in prolonged or obstructed labor [3]. Albeit, it is a potential threat to the well-being of both mother and children, when taking place unnecessarily. It is linked to certain short-term and long-term risks particularly in low resource settings [4]. Chances of infection and injury are on the higher end. Research says it could also derail initiation of breastfeeding and in some cases, it may require emergency hysterectomy as well. Furthermore, many CS cases create persistent pain and may hamper future deliveries [5]. Even more alarming is the continued reporting of unanticipated long-term risks of CS. These include ectopic pregnancy, unexplained stillbirth, placenta praevia, placenta abruption, haemorrhages and hysterectomy, endometriosis, and an increase in hospital readmissions. According to some records, CS delivery is also associated with an increase in the incidence of cardio metabolic diseases (childhood overweight and obesity, type I diabetes), autoimmune and inflammatory disorders (allergic rhinitis, food allergy and atopy, asthma, celiac disease, inflammatory bowel disease), and autism. Therefore, the overuse of caesareans is a grave public health concern that requires immediate attention [6].

One of the main reasons to perform CS is to improve neonatal outcomes and reduce risk of mortality and morbidity. However, evidence suggests CS is associated with a greater risk of respiratory distress, asphyxia and various pulmonary infections in infants. In some settings it was observed that, maternal mortality was greater for CS than for vaginal birth, probably because of adoption of unnecessary CS [7].

The increasing rate of CS in Bangladesh during the last two decades is frightening. In 2000, CS rate was only 3% and it increased to 24% in 2014 [8]. In addition, 80% of the total CS occurred in the private health facilities which increased from about 48% in 2004. In contrary, CS use declined from nearly 50% in 2004 to only 15% in 2017/18 in the governmental health facilities. Such rising of CS use is mainly due to availability of CS in the private health facilities which could also lead to a double burden of CS in Bangladesh [9].

It is imperative to mention that, the private sector is largely profit-driven, and doctors in private hospitals receive financial incentives for doing surgery, which may drive some clinicians to prescribe CS delivery for moms [10]. Net income of health care providers is higher for CS delivery compared to vaginal delivery. In a report it was found that the cost of a normal delivery at a hospital in poor countries of Africa and Latin America ranges from US$ 10–35 and a caesarean section or a complicated vaginal delivery can cost from US$ 50–100 [8]. In addition, in comparison to normal delivery, CS requires higher days of hospital stay implying higher medical care cost and loss of income for the household. If CS takes place at private health care institutions, medical care expenses are usually even higher [11].

Several global studies have shown inadequate quality of maternal health care. The perceived quality of maternity and new-born health care (MNH) in both public and private facilities in Bangladesh is poor. Numerous private clinics lack a broad array of Emergency Obstetrics Care (Em OC) services, critical equipment, and employ substandard medical procedures [12]. Even though the rates of C/S are much higher than the WHO-recommended threshold, few researches have examined if the higher rates are acceptable in terms of signs and increased benefit to mother and child.

This study was conducted to determine the indication of CS and foetal outcome in a selected tertiary hospital in terms of viability, weight, and APGAR score, as well as the socio-demographic characteristics of the study population and the health outcomes of women who underwent CS and their infants.

Methods

Study design and settings

A descriptive, cross-sectional study design was employed for this study. The duration of the study was from November 2017 to March 2018. This study was carried out in the paying wards of Department of Obstetrics and Gynaecology of Bangladesh Medical College Hospital (BMCH), Dhaka. This is a tertiary level hospital in Dhaka city. Purposive sampling method was used.

Participants

The study respondents included pregnant women who were admitted for delivery in the paying wards of BMCH during that time frame. The inclusion criteria included those pregnant women who were admitted in the Inpatient (paying wards) Department of Gynae and Obstetrics and underwent deliveries during our study period. The exclusion criteria consisted of those pregnant patients who were admitted elsewhere other than the paying wards of Department of Gynae and Obstetrics; those who were not willing to participate and those patients whos' medical files and documents could not provide all the vital information required for our study. Due to time constraints and other limitations, around 306 pregnant women took part in the study. Written, informed consent was obtained from the participants.

Data collection and statistical analysis

Hospital records and documents were the data sources. Semi-structured questionnaires were used to collect the necessary information from the patients by face-to-face interviews. Statistical Package for Social Sciences (SPSS Version 20) was used to generate and analyse the collected data. Data were expressed in the forms of means, frequencies and percentages and presented in tables or figures where relevant.

Ethics

Proper safety measures were taken in every step of the study. Clearance was obtained from Institutional Review Board (IRB) of BMCH. According to Helsinki Declaration for Medical Research involving Human Subjects 1964, all the patients were informed about the study design, the underlying hypothesis and the right of the participants to withdraw themselves from the research at any time and for any reason whatsoever.

The following ethical issues was addressed accordingly:

- Strict confidentiality and security of data related to the patient was maintained.
- The presentation of data and information related to the patient was documented anonymously.

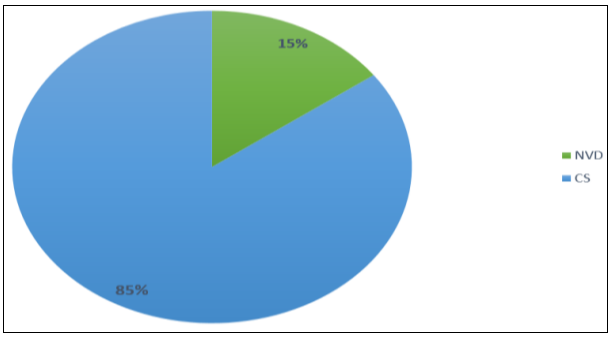
Results

Table 1: Socio-demographic and obstetric characteristics (n=306)

Attributes	Frequency (n)	Percentage (%)
Age group (in years)		
<20	53	17.3
20-30	200	65.4
>30	53	17.3
Mean ± Standard deviation	26.35 ± 5.08	
Religion		
Islam	274	89.5
Hinduism	32	10.5
Parity		
Multipara	179	58.5
Primigravida	127	41.5
Duration of current pregnancy (in weeks)		
>36	181	59.2
28-36	114	37.3
<28	11	3.6
Mean ± Standard deviation	35.89 ± 4.23	

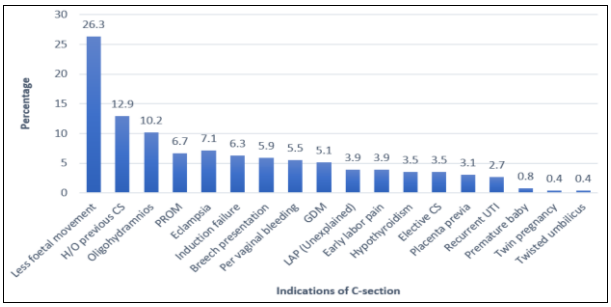
The table depicts the socio-demographic along with obstetric characteristics in the participants. It was seen that, mean age was 26.35 ± 5.08 years and majority of the patients [200 (65.4)] belonged to 20-30 years. Most of the participants [274 (89.5)] were Muslims. Furthermore, maximum respondents [179 (58.5)] were multiparous. Besides, mean duration of current pregnancy was 35.89 ± 4.23 weeks and the length of current pregnancies were >36 weeks in majority patients [181 (59.2)].

Fig 1 illustrates a pie chart expressing the mode of delivery in the respondents. It was clearly evident that, among the 306 mothers, majority of the deliveries [260 (85%)] was by caesarean section.



*NVD: Normal vaginal delivery; CS: Caesarean section

Fig 1: Pie chart showing mode of delivery (n=306)



**Multiple response; H/O Previous CS: History of previous C-section; UTI: Urinary tract infection; GDM: Gestational Diabetes Mellitus; PROM: Premature rupture membrane; LAP: Lower abdominal pain.

Fig 2: Bar diagram showing distribution of the participants according to indication of Caesarean delivery

Fig 2, a bar diagram, describes the various indications of caesarean sections of the participants. It was found that, less fetal movement [67 (26.3%)] was the commonest indication followed by history of previous CS [33 (12.9%)] and oligohydramnios [26 (10.2%)]. Among the rare causes, premature baby [2 (0.8%)], twin pregnancy [1 (0.4%)] and twisted umbilicus [1 (0.4%)] were detected.

Table 2: Fetal outcomes of the deliveries

Attributes	Frequency (n)	Percentage (%)
Viability of the fetus (n=306)		
Live birth	280	91.5
IUD	18	5.9
Still birth	8	2.6
Congenital anomalies at birth (n=280)		
Absent	275	98.2
Present	5	1.8
Weight at birth [in kg] (n=280)		
<2.5	69	24.6
>2.5	211	75.4
Mean ± Standard deviation	2.82 ± 0.53	
APGAR score (n=280)		
Condition at 1 minute		
Baby is in good health (7-10)	229	81.8
Moderately abnormal (4-6)	49	17.5
Baby needs attention (0-3)	2	0.8
Condition at 5 minutes		
Baby is in good health (7-10)	266	95.0
Moderately abnormal (4-6)	13	4.6
Baby needs attention (0-3)	1	0.4

***IUD: Intra uterine death

Table 2 highlights the fetal outcomes of the deliveries performed in this research. Regarding viability status, 280 (91.5%) gave live births. Out of the alive fetuses, 5 (1.8%) had some congenital anomalies. The birth weight in majority cases [211 (75.4%)] was healthy, meaning more than 2.5 kg. Lastly, the APGAR scoring in both 1st and 5th minutes revealed that, in most of the cases (81.8% and 95.0% respectively) the condition of the baby after birth was good.

Table 3: Distribution of the patients based on discharge from the hospital (n=306)

Discharge details	Frequency (n)	Percentage (%)
Mode of discharge		
Discharge with advice	252	82.4
Discharge on request	47	15.4
Discharge with risk bond	7	2.3
Condition of the patient during discharge		
Stable	282	93.1
Unstable	24	6.9

Table 3 reveals the information regarding the discharge of the participants from the hospital. In context of mode of discharge, most of them [252 (82.4%)] were discharged properly with advice. Only 7 (2.3%) were discharged with risk bond. Regarding condition of the patient during discharge, it was revealed that, majority [282 (93.1%)] were released from the hospital in a stable condition.

Table 4: Length of hospital stay (n=306)

Duration (in days)	Frequency (n)	Percentage (%)
<3	84	27.5
3-5	166	54.2
>5	56	18.3
Mean ± Standard deviation: 4.30 ± 1.83 days, Range: 1-11 days		

Table 4 sheds light on the duration of hospital stay of the study participants. Mean length was 4.30 ± 1.83 days; most of the patients [166 (54.2%)] had a stay of 3-5 days in the hospital before, during and after the delivery.

Discussion

Caesarean section (CS) is a major obstetric intervention for saving lives of women and their newborns from pregnancy and childbirth related complications. Unnecessary C-sections may have adverse impact upon maternal and neonatal outcomes.

The research found that, majority of the patients were aged between 20-30 years old and were Muslims. Evidence from Bangladesh Demographic and Health Survey (2017-18) [13] suggested that, 35.2% and 25.8% participants belonged to age group 20-24 years and 25-29 years respectively. Another nationally representative cross-sectional study [4] mentioned that, mothers aged 25 to 35 years old had the highest rate (26.50%) of CS deliveries, and mothers' age was significantly ($p < 0.01$) associated with mode of delivery. Besides, religion was also significantly associated with mode of delivery ($p < 0.05$), and Muslim mothers had a lower rate of CS delivery compared to non-Muslim mothers (23.60% vs. 28.50; $p < 0.05$).

Besides, it was evident that, most of the patients were multiparous. The BDHS report [13] revealed that, 32.1% patients having 2nd birth order and 28.9% were having 3 or more. The differences owe to the socio-demographic characteristics including area of residence and economic status of the participants.

Research says, the knowledge of pregnancy complications and fear of labor pain usually make them opt for CS. Such findings were evident in a study [14] in Bangladesh, where CS deliveries were common among women of late reproductive age. Furthermore, the previous nationally representative paper [4] which involved survey from 2014, out of total 4433 participants, 1065 (24%) had CS delivery, and the remaining 3368 (76%) had a vaginal delivery. These findings are dissimilar to our results. The difference can be explained by secular trends and increased demand of elective CS among the families of late in these regions. However, the opposite trend has also been observed in developed countries, where higher education and economic status were protective against C-section as awareness and knowledge of childbirth are expected to be high among this group of women [15].

A population-based study [15] done in Matlab, Bangladesh elaborated that, of all C-sections, only 1.4% was conducted for Absolute Maternal Indications (AMIs). Major indications of C-sections included: Repeat C-section (24%), foetal distress (21%), prolonged labour (16%), oligohydramnios (14%) and post-maturity (13%). Meanwhile, our research found that, less foetal movement, history of previous CS, oligohydramnios and premature rupture membrane (PROM) were the commonest factors. A possible explanation with history of previous CS being a common indication is that subsequent deliveries are presumed to have higher risks after the birth of the first or second child with a CS. Also, the procedure's efficacy to avert the risk from mother and child creates a positive perception of women towards this procedure, resulting in opting for CS for subsequent deliveries.

CS, like any other operation, can result in serious problems for both the mother and the baby. Infections, fever, unusual bleeding, muscular soreness, headaches, and the dangers of anesthetic problems are the most frequent complications for women. There is also the possibility of pregnancy issues after a CS, including an inability to conceive children in the future [16].

It can be mentioned that, the fetal outcomes in our study were overall fair in terms of viability, congenital anomalies, weight of the baby at birth and APGAR score. Relevant paper [17] found that, fetal complications included low birth weight (88.33%) and prematurity (20%). Number of antenatal visits, available health facilities and awareness regarding maintaining optimum health of the mothers throughout pregnancy are one of the core factors in this context. Furthermore, a study [18] performed in a low resource area of Keraniganj, Dhaka revealed that, among fetal distress babies 11.32% babies had APGAR score <7 as compared to babies without fetal distress that had 5.66% APGAR score <7 at 5th minutes ($p<0.05$). Adverse neonatal outcomes were noticed in low resource settings where facilities were limited.

In a study [19] done in Ethiopia, 34.80% women remained in health institutions for ≥24 hours after delivery. Gestational age, birth weight and mode of delivery were significantly associated with length of stay. It was seen that, mothers who had a vaginal delivery were 8.89% (adjusted HR (AHR) 8.89, 95% CI (4.28 to 18.46), $p<0.001$) more likely to discharge earlier from health facilities after delivery, compared with those who had a CS. Meanwhile, we found the majority of our patients resided in the hospital at a range of 3-5 days.

All in all, women must be made aware of the harmful impacts of CS. Additionally, service providers must be adequately controlled to ensure that CS is only carried out when necessary and not for commercial advantage. By educating people, raising awareness, identifying cases, directing people to treatment, healthcare professionals, lawmakers, and decision-makers should all collaborate to end fistula. Government oversight must be improved, and disadvantaged populations must be encouraged to use CS services when required.

Conclusion

Our findings suggested that most of the deliveries were performed by caesarean section and there were both medical necessities as well as elective purposes. Both fetal and maternal outcomes were overall healthy and good with few adversities. Despite all this, it is advisable to limit unnecessary C-section deliveries and give priority to normal vaginal delivery for the betterment of both mother and baby. These initiatives should be taken from all ends.

Recommendations

- Benefits of normal vaginal delivery should be widely known and promoted.
- Campaigns can be designed to educate mothers and families about the benefits of normal delivery and the risks of unnecessary C-sections.
- The government can monitor private hospitals and regulate healthcare workers.
- Midwifery-led care can be initiated to promote natural childbirth.
- Routine clinical audits can be conducted to monitor C-section deliveries.

Limitations

The study is a cross-sectional study so long-term outcomes could not be assessed and cause-effect relationship could not be evaluated. Certain variables such as ante-natal visits, obesity, mothers' education, working status, wealth status, area of residency, mass media exposure and so on were not addressed.

Conflict of interest disclosure

The authors declare that they have no conflicts of interest.

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None.

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