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Prevalence and Determinants of Caesarean Section in a Private Health Facility: A Cross-sectional Study

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Abstract

Emergency obstetric care (EmOC) has dramatically lowered the maternal death rate in Bangladesh since the early 1990s. Rising caesarean section rates over the past ten years have had an impact on the nation's economy in addition to other signs of better mother care. According to demographic and health surveys, caesarean section rates increased from 3.5% in 2004 to 23% in 2014. Women who become pregnant after 35 years, live in cities, have a higher level of education and frequently use antenatal services have a greater average annual rate of prevalence in caesarean sections. The objective was to assess the indications and the trends of caesarean sections done over a two-month period. The study of prevalence and determinants of caesarean section was conducted in a renowned private hospital in Dhaka. Among 197 women who were admitted to the department of obstetrics and gynecology, the number of total deliveries was 175 (89% of total admission). The indications varied a little in cases of lower abdominal pain and preeclampsia. Antepartum hemorrhage (APH) and breech have a small proportion (about 5% both). The proportion of repeated caesarean sections was 47%. Recently the indication of a maternal choice is also coming up (11%). The data were compared and analyzed to determine if the indications were significant enough for cesarean delivery. Although a caesarean section is currently a relatively safe obstetrical procedure, it is advised that the indications should be carefully evaluated in order to lower caesarean section rates.

Key words: Caesarean section, menstrual period, lower abdominal pain, preeclampsia, antepartum hemorrhage (APH), breech.

Introduction

Caesarean section (CS) is a significant obstetric procedure used to rescue the lives of mothers and their infant from difficulties linked to pregnancy & childbirth. Unnecessary CS may have a negative effect on the health of the mother and the newborn. Data on clinical indications for CS at the population level are scarce in Bangladesh.

It is a surgical intervention to prevent fraudulent obstetric outcomes, potentially saving both the mother's and the fetus' lives (Campbell *et al*., 2006). Worldwide, caesarean sections are expected to reduce about 187,000 maternal and 2.9 million newborn deaths yearly (Campbell *et al*., 2006; Lumbiganon *et al*., 2010). Unnecessary caesarean section poses dangers to both the mother and the newborn Wilmink *et al*., 2010). The World Health Organization (WHO) came to a conclusion that needless caesarean sections increases the risk of maternal mortality and morbidity, newborn death, and neonatal admission to intensive care based on data from a survey of 373 facilities across 24 countries in 2008 (Souza *et al*., 2010). In addition to the possibility of negative health consequences, needless caesarean sections put a significant financial burden on the person, family and society at large (Chongsuvivatwong *et al*., 2010). Around 2.32 billion US dollars worldwide are thought to be spent on postpartum medical care and re-

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hospitalization related to needless caesarean sections. There has been an increase in caesarean sections rates worldwide during the past couple of decades. Although very low and very high caesarean sections levels can be detrimental, an ideal rate is not recognized. In the interim, until more study yields a more accurate assessment, WHO considers a range estimate of 5-15% to be fair. In 2014, caesarean sections were used to deliver babies in about 18% of deliveries worldwide. Latin America and the Caribbean had the greatest rate of caesarean sections (32%), while Africa recorded the lowest rate (7%) (Betrán *et al*., 2016). In 43 Asian and African nations, collected data from demographic and health surveys revealed a greater rate of caesarean sections among urban rich women and a lower rate among rural poor women, according to a recent analysis (Diamond-Smith & Sudhinaraset, 2015). Numerous studies, mostly from high- and middle-income nations, looked into the factors that influence caesarean sections usage, although the findings were mixed (Ahmed *et al*., 2016; Feng *et al*., 2012; Rahman *et al*., 2014). Prior CS was the biggest indicator of CS operation, according to a recent cohort study conducted in the United States (Witt *et al*., 2015). The biggest indicator of CS, according to a systematic assessment of 17 researches, was a maternal choice (McCourt *et al*., 2007). Maternal education, birth order, age and extended labor were revealed to be significant predictors of caesarean delivery in two regional studies conducted in Bangladesh (Rahman *et al*., 2012). This research, however, was restricted to only a few particular determinants and did not investigate the variation in CS across various socio-demographic variables.

Additionally, only regional data were used in place of national statistics. The regional variation must be taken into consideration; otherwise, the national rate may conceal a significant amount of intra-socio-geographic variability. When criteria are identified and corrected for geographical variance, suitable actions can be taken to rationalize the use of CS. Bangladesh has made significant advancements in mother and child health. Today, 36% of Bangladeshi mothers receive postnatal care, while 79% of women receive antenatal care. A startling 61% and 77% of deliveries ended in CS, respectively, in 2014, when 37% of babies were delivered in informal healthcare facilities overall, including 22% in private facilities (Khan *et al*., 2017). This rising rate of CS in Bangladesh may be influenced by a number of variables, such as the high rate of adolescent pregnancy (35%) and rising rate of late-age pregnancy (5%), as well as the mothers' improving socio-economic and educational status and the ongoing dual nutritional burden (co-existing conditions of under and over nutrition) (Neuman *et al*., 2014; Rahman *et al*., 2012).

However, it is unclear whether socio-demographic categories are seeing a relative increase or declining trends in CS usage, and it is also unclear whether these patterns are affected by variables like geography. Therefore, it is crucial to conduct a thorough investigation of the relative rate of change in the prevalence of CS in Bangladesh and pinpoint the variables that are affecting this change.

The rise in CS performed for non-medical purposes is a significant factor in the increase in CS rates worldwide (Aminu *et al*., 2014). Up to one-third of the 18.5 million caesarean sections performed each year around the world are reportedly performed for non-medical reasons and have been considered "unnecessary" (Lavender *et al*., 2012). Only 37.5% of births worldwide occur in the middle- and high-income countries, whereas 60% of births worldwide occur in low-income nations. As of now, middle- and high-income nations are mostly responsible for the rise in CS rates worldwide (Chen *et al*., 2018). CS rates are rising in Bangladesh despite the country's very low percentage of skilled birth attendance (26.5%). From 2.7% in 2001 to 17% in 2011, the rate of cesarean deliveries has increased six-fold recently (Mazzoni *et al*., 2011). However, increased caesarean sections rates aren't always linked to enhancements in maternal and perinatal health indicators or treatment quality (Parkhurst & Rahman, 2007). As a result, there may be a greater chance of maternal morbidity and mortality.

Materials and Methods

It is a retrospective analysis of all caesarean sections performed over a two-month period in a private hospital that is primarily recognized for its maternity care. The statistics record book, which the hospital and department both compile on a regular basis, contained information on all deliveries. Individual patient information was gathered from the hospital record room. This comprised the overall number of obstetric admissions, the number of caesarean sections, vaginal deliveries, and their justifications for admission. The comparison and calculation of the proportions of the main contributing components. Only one significant signal was used when two or more contributing elements were present. The graph displays the upward tendencies.

Results and Discussion

Over the course of the two months (June and July of 2018), 197 women in total were hospitalized to the obstetric unit. There were 175 total deliveries, which made up around 89% of all admissions. Due to incomplete information of some patients, data of 149 out of 175 were calculated, among which 146 patients had undergone caesarean section.

Mode of delivery: The caesarean birth rate was 96%. Spontaneous vaginal deliveries were 4%.

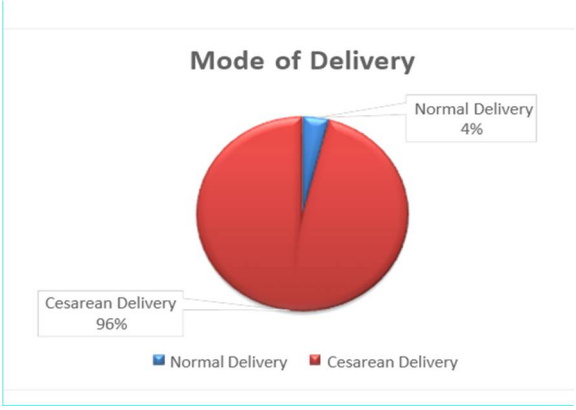

Figure 1. Mode of delivery.

Primary vs repeat caesarean sections: The 52% of the study's participants had main CS for the first time, whereas 48% had repeat CS in the age range of 22-26. About half (54%) of primary CS was due to labor discomfort, "rupture of membranes," and preeclampsia, whereas for 83.4% of repeat CS, the only clue was a prior CS.

If the mother's age is considered a factor affecting the first time or repeat CS in our study, there is no significant difference in the proportion (Table 1).

Table 1. Primary versus repeat CS.

Age range	First time CS	Repetition of CS	Total	Percentage of first time CS	Percentage of repetition of CS
22-26	13	12	25	52%	48%
27-31	46	37	83	55%	45%
32-36	17	18	35	49%	51%

Indications for caesarean section delivery: In 99.4% of all patient records retrieved, the indication for delivery was recorded (Figure 2). Six patients who had expected vaginal delivery were reported to go to the hospital with complaints like labour pain, vaginal discharge, and premature membrane rupture.

The four most typical indications for CS among the 146 patients were (in descending order): Lower abdominal pain, preeclampsia, P/V watery discharge, and premature rupture of membrane together, accounting for 77% of all CS conducted.

Of the 146 patients in this study, 17 deliveries were elective (11%), meaning performing CS was a maternal choice despite any significant complaint.

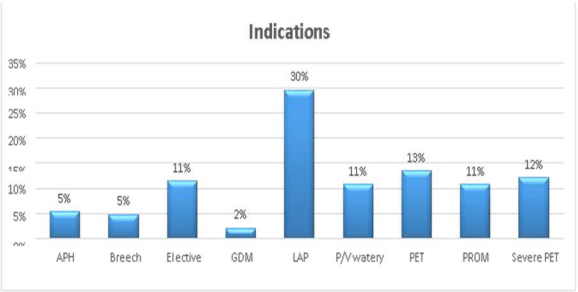

Figure 2. Indications for delivery.

The major reasons which are actually considered as the indication for CS in medical science to minimize the risk of the mother's health condition are anti-partum hemorrhage (APH) and breech position of

the baby. In this study, these two factors comprised only 10% of total CS.

According to this study, lower abdominal pain (the most common and natural symptom of labor) has been counted as the chief complaint of patients undergoing cesarean section (30%).

Gestational age: The comparative analysis of the number of CS performed at various gestational stages is shown in figure 3.

The gestational age, which is a measurement of the age of a pregnancy, is determined by a woman's last menstrual period (LMP) or the matching age of the gestation as computed by a more precise method, if available. These techniques involve obstetric ultrasound or adding 14 days to a known number of days after fertilization (as is achievable with in vitro fertilization).

Among them 98 of the babies (66%) were born on "term" which is between 37-40 weeks. The percentage of "preterm" babies was (30%). However, babies born at 36 weeks are also considered as healthy. A small number of babies (4%) were born after week 40 which is sometimes considered as "Term" according to some studies.

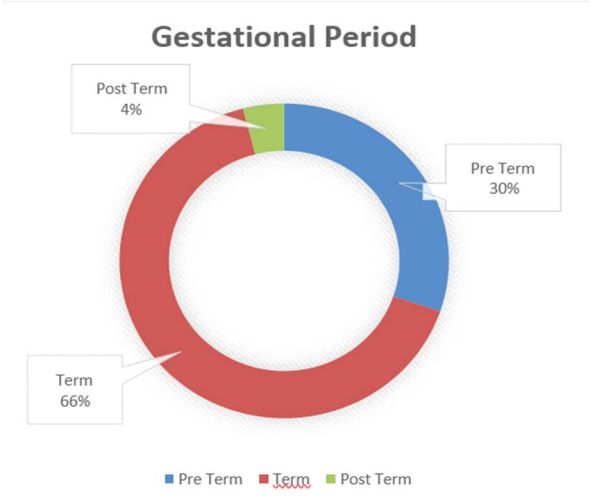

Figure 3. Gestational period.

History of co-morbidity health conditions: Gestational diabetes mellitus accounted for 33% of the patients. Some of them also had asthma (2%).

Patients with hypertension accounted for (35%) There were 3 patients with a history of poly cystic ovarian syndrome. A single patient with non-epileptic seizure was also reported. The 32% (47/149) of patients had no history of previous illness (Table 2).

Table 2. History of past illness.

History of past illness	No. of patients	Percentage
Asthma	3	2%
GDM	39	26%
GDM, a sthma	4	3%
GDM, PIHTN	1	1%
GDM, HTN	4	3%
GDM, sinusitis	1	1%
NES	1	1%
PCOS	2	1%
HTN	43	29%
HTN, a sthma	3	2%
HTN, PCOS	1	1%
No past history	47	32%
Grand total	149	100%

[GDM- Gestational Diabetes Mellitus, HTN- Hypertension, PIHTN- Persistent Intradialytic Hypertension, NES- Non Epileptic Seizure, PCOS- Poly Cystic Ovarian Syndrome]

Birth weight of the baby: The body weight of a newborn is referred to as birth weight. The typical range for neonates of European descent is between 2.5 kilograms and 4.2 kilograms with all but 5% falling within this range. However, the average birth weight for babies of European descent is 3.5 kilograms. Babies with south Asian and Chinese ancestry typically weigh less than 2800 grams. 82.5% of the total babies (123/149) were in the range of "healthy weight (HW)" 17% (25/149) were in the "low birth weight (LBW)" range. Among these, 4 babies had fetal distress during birth. Only one baby with "very low birth weight (VLBW)" was born during the study period and had severe fetal distress. All the babies were monitored with regular heart and respiratory rates except for those with fetal distress. Figure 4 represents the birth weight of all the patients.

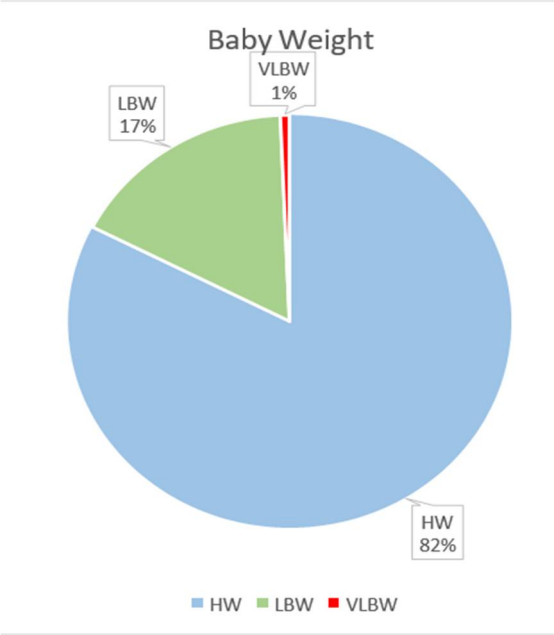

Figure 4. Birth weight of babies

Antenatal check-up: Nearly 3/4 of the women had 4 or more antenatal care (ANC) visits. While these appointments, they received nutritional advice, information on the necessity of getting enough sleep while pregnant, and recommendations to attend postpartum check-ups for both the moms and the infants. Even with the two moms who had previously had caesarean sections, the health professionals did not mention the prospect of a caesarean section in case complications arose, despite their recommendation that the ladies give birth in a medical institution with trained attendants. Therefore, setting aside money for such an emergency was also not covered.

Menstrual history: Regular menstrual history had been reprted by 51% patients, meaning half of the patients had irregular, periodic cycles.

History of anemia: Anemia were diagnosed in 126 out of 149 patients, accounting for 85% of the total patients. Among other surgical histories, dilatation & curettage were significant. A surgery called dilation and curettage (D&C) removes tissue from within the uterus. In order to detect and treat some uterine disorders, such as severe bleeding, or to remove the uterine lining following a miscarriage or abortion, doctors perform dilation and curettage. A single patient was found to be undergone infertility treatment.

This study looked at how variables other than a medical cause of CS affected healthcare practitioners' judgement. It highlighted the justifications for both elective and emergency CS at a private hospital in Bangladesh's capital city of Dhaka that is primarily recognized for its maternity care. In this analysis, leukocyte alkaline phosphatase (LAP) was the major indication (30%) for CS and the main factor that more than half of all elective caesarian sections reported. According to our findings, 11% of CS procedures in this study were carried out without a valid medical justification.

If it were possible to conduct a more in-depth investigation of the CS indicators, this number might be greater. For instance, not every woman who had previously undergone a CS could have needed a repeat CS. The use of CS for indicators like "post term dates," an unsightly cervix, and membrane rupture would have been prevented if there had been adequate regulations and resources for safe induction of labour or augmentation. Other factors contributing to the "over-medicalization" of maternity care include the difficulty or unwillingness to enforce good evidence practices, such as assuring company throughout labour and delivery, offering variety of medications & pain-relieving techniques, & assisting with delivery when necessary with forceps or ventouse (Aminu *et al*., 2014).

In a study of 300 cases of CS, a tertiary hospital in Pakistan discovered that 88.7% of the cases were emergency CS and 11.3% were elective CS. 209 CS were conducted at the district level in Pakistan, with 11.9% of them being emergency procedures and 82.4% being elective procedures. The most prevalent warning signals of CS in Nepal at the tertiary level included slow labour progression, past CS, foetal distress, and breech birth. The most frequent causes of CS, according to a different study done in urban Bangladesh, were cervical dystocia, pre-eclampsia, and fetal distress (Maaløe *et al*., 2012). Other research

from low- and middle-income countries suggest that the proportion of CS performed without a clearly stated medical indication may be higher. Similar to the last study, it's likely that some of the findings in this one could be deemed incorrect, such as CS performed for foetal distress when there was no sign of foetal distress at delivery or CPD incorrectly diagnosed.

The majority of emergency CS (89%) were carried out during regular working hours, which was attributed to a manpower deficit. Because an obstetrician and anaesthetist are frequently unavailable when needed 24/7 in rural Bangladesh, emergency obstetric care treatments, such as CS, are frequently unavailable. This is likely also a role in the increase of elective CS treatments across a range of LMICs where a physician shortage is a problem. The challenge of providing prompt emergency obstetric treatment (including CS) when this is necessary outside of "regular working hours" is a significant barrier to providing high-quality, patient-centered, evidence-based maternity care, including CS, when this is clearly indicated by a medical professional. Along with adhering to evidence-based criteria and determining a distinct medical reason for caesarian section as a medium of delivery, there are other factors that physicians must consider before performing CS in public hospitals at the district level in Bangladesh.

Lack of compliance with current procedures emphasizes the need for a more transparent transmission of regulations through professional organizations. This is part of reorienting healthcare professionals to the most recent evidence-based obstetric care methods. Bangladesh's national rules for delivery following a prior CS are now in accordance with the WHO and FIGO recommendations, which both discourage a repetitive CS unless there is a distinct indication for it. Only 25–30% of women with a past CS need one for their second pregnancy, according to what medical professionals are taught. However, it is essential to inform medical professionals, expectant mothers, and their families about the possible dangers of CS delivery given that patient demand. Also decision is highly impacted because of the competitive private interests. Previous articles have discussed the considerable "out of pocket" costs as well as ongoing costs of CS in LMIC, including Bangladesh. This study demonstrates that, the private healthcare system continues to exert significant pressure on women to give birth via CS, even at the district level, as well as rural families' willingness and ability to pay for this expense. Demand-side financing techniques in Bangladesh have not yet considerably raised CS rates. (Maaløe *et al*., 2012).

Although there are still hazards associated with caesarean sections, the procedure is significantly safer than in the past. At the same time, obstetricians are now more likely to recommend caesarean sections due to increased knowledge of the risks associated with vaginal delivery (Chu *et al*., 2010) and rising dissatisfaction among women with lengthy vaginal labours (Anwar *et al*., 2008; Schmidt *et al*., 2010). Caesarean sections performed at the mother's desire have gradually increased in frequency in recent years. It is still debatable whether or not a Caesarean section should be performed at the patient's wish. (Nguyen *et al*., 2012).

According to studies, maternal request (23%) was one of the leading causes of C/S in 199624. Another frequent cause of high caesarean section rates is defensive obstetrics. It was found that 82% of doctors performed C/S to defend against malpractice accusations. (MacArthur *et al*., 1997). Recurrent caesarean sections contributed 29%, suspected foetal distress contributed 22%, labour stagnation contributed 20%, 88% of the babies were born breech, low birth weight contributed 39%, and maternal choice contributed 7%.

Other research revealed that foetal distress (12.9%), failure of progress (19.3%), and repeat caesarean sections (34.3%) were the three primary causes of caesarean sections. A study conducted in our nation revealed that repeat caesarean sections reduced by roughly 2.95% over the course of eight years. Because the same patient came to the hospital for each of her subsequent deliveries, the rate rose in

our study. In the same study, there was a slight rise in the rate of foetal distress and malpresentation (3.79% and 2.53%, respectively), but a significantly larger increase in the rate of caesarean sections performed for obstructed labour and eclampsia (2.79% and 3.75%, respectively). However, our study revealed a significant decrease in obstructed labour and eclampsia (4.2%, 2%) and a significant rise in foetal distress and malpresentation (6.7%, 2%). The socioeconomic status of the patients who attend both venues is what causes this discrepancy. However, globally, the prevalence of caesarean sections has increased in several nations.

The increasing number of caesarean section indications, the use of foetal monitors, the current medico-legal environment, and the indications for performing caesarean section have changed significantly in recent years and continue to alter for a variety of reasons. Currently, most caesarean sections are done to help the foetus rather than the mother. In order to analyze and perhaps lower the rates, this study compared changes in caesarean section rates. The results of this retrospective study suggest that the rate of caesarean sections could be decreased in certain patient categories, even though the causes are typically multifactorial and also include the number of referrals and workload pattern of the tertiary hospital, as well as the socioeconomic status of the patients and their demands for the service.

Conclusion

Around 95% of births were delivered by CS, and this percentage is steadily rising. Significant risk factors for CS included maternal age, socioeconomic status, the number of children born, the frequency of antenatal visits, and the prior incidence of CS. These findings warrant further investigation to ascertain the precise reasons for excessive CS use in some geographical regions, urban areas, and by a subgroup of women, as well as to ascertain whether there is restricted access for those who are relatively less affluent even when CS is necessary. The task of rationalizing CS use is challenging and involves a lot of legislation, research, and interventions. Women must be made aware of the risks associated with CS and the importance of keeping a healthy weight. Additionally, stronger regulation of service providers is required to ensure that CS is only ever employed for necessary purposes and never for financial gain. Today, a caesarean section is unquestionably a very safe obstetrical procedure. But even in tertiary care hospitals, there is some morbidity. The prevalence of caesarean sections has increased with the development of contemporary surgical methods and safer anaesthesia. Additionally, due to safety concerns, patients who have had previous caesarean sections are more inclined to have another one during later pregnancies.

Because of this, we must conduct a third or fourth caesarean section, which unquestionably has a substantial risk of morbidity. Caesarean section indications need to be evaluated very carefully. Mothers who choose a caesarean section purely out of free will need to receive appropriate counselling. Additionally, labour analgesia needs to be enhanced.

Limitations

- This study has a primary drawback in that it only covers one hospital for a brief period of time, which does not picture the actual CS rate scenario in our country.
- Since only the primary indication was recorded out of numerous reasons for doing the surgeries, some indications did not disclose the true proportion in the retrospective investigation.
- Due to a shortage of raw data, additional tables pertaining to caesarean section complications could not be provided.
- No Data on patient's medication history was obtained which is a very influencing factor in the method of delivery or prescribing pattern after delivery.
- Though there was data regarding the patient's weight, but no data input of height was present. Due to this lacking, the body mass index (BMI) of the patient could not be calculated, which is also a contributing factor for performing CS.
- The study's findings on factors affecting CS decision-making primarily mirror the opinions of

healthcare professionals. Patients' perspectives, which might have emphasized other crucial factors, were not investigated.

– Due to some policies and confidentialities of the hospital, the data collection procedure was not fully contained in the required information.

The best way to motivate healthcare professionals to provide top-notch patient-centered, evidence-based obstetric care while avoiding over-medicalizing therapy. According to a recent Cochrane analysis, there is growing evidence that following guidelines, getting a second opinion, and getting peer review comments could reduce the number of CS cases. More research is needed for this.

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