

Original Article**Cesarean Delivery Profile in a Military Hospital of Bangladesh- A Retrospective Study**Col. (Dr.) Hasan Morshed¹, Lt. Col. (Dr.) Ismat Ara², Atiqul Islam³

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Abstract:

Background: In recent years there have been substantial increases in the cesarean delivery [CD] rates in Bangladesh.

Objectives: With this background, a study was undertaken to describe cesarean delivery rate, indication of cesarean delivery, health outcome of mother and newborn attributed to the procedure.

Methods: This retrospective chart review study [the period from February 1, 2014 to January 31, 2015] was carried out at Military Hospital of Bangladesh with the approval of the Institutional Ethics Committee. CD rates were computed by several maternal and newborn characteristics including maternal age, neonatal birth weight and parity. Three categories were used for maternal age: less than 18 years, 18-34 years, and 35 or older. Three groups were also used for neonatal birth weight: less than 2499 grams (low birth weight), 2500-3999 grams, and 4000 grams or more (macrosomia). Parity was divided into two groups: primiparas and multiparas. Main indication for caesarean delivery was also collected from operation list submitted by the obstetricians. Types of surgery [e.g. emergency or elective] were also evaluated.

Results: During the aforementioned period of time there were 617 deliveries, which included 166 normal vaginal deliveries (NVD) and 451 CD. There were two intrauterine fetal deaths. Two hundred and seventy two patients underwent primary CD (i.e. with no history of previous cesarean section). There was exclusion of 23 deliveries [lack of records]. Thus study population consisted of 594 women and their newborns. Cesarean delivery rate obtained for the period studied was 72.05% (428/594), with primary CD rate being 62.10% (272/438).

Conclusions: We conclude that the incidence of CD at our hospital is too high. Further studies are needed to provide clear answers as to the causes [etiologies] of this trend.

Keywords: Cesarean deliveries, morbidity, indications, morbidity.

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Introduction:

Caesarean delivery (CD) is a common operative procedure in obstetric practice throughout the world, to ensure a healthy outcome of mother & newborn. A leading editorial has stressed for need of international attention in the rising trend of CD.¹ Recent data on cesarean delivery rate from different hospitals of Bangladesh are scarce. However incidence of CD varies from hospital to hospital within a country and across a nation. At the present moment there is no comprehensive and extensive study on the incidence of CD in our hospital, though it is being increasingly employed in all hospitals.

An assessment of cesarean delivery profile might be useful to analyze the future caesarean delivery

scenario and which may help healthcare providers for future plan of action in improving obstetric care. With this background, a study was undertaken to describe cesarean delivery rate, indication of cesarean delivery, health outcome of mother and newborn attributed to the procedure in a secondary military hospital.

Materials and Methods:

This retrospective study was carried out in a secondary military hospital of Bangladesh. This hospital provides all medical service including obstetric care to military personal and their family members. This hospital has good obstetric services, including blood bank facilities and anesthetic services. Newborn intensive care unit

was not adequately equipped in our hospital, thus newborn requiring prolonged intensive care support were referred to a tertiary care hospital.

The Institutional Ethics committee has approved our study and waived the need for informed consent, as the data were collected retrospectively from the case records. Patients' identities were de-identified. All patients who delivered baby during the period of 1st February 2014 to 31st January 2015 were included in this study. This was a registry based study. Purposive nonprobability sampling technique was applied in this research work.

Data were retrieved from different registers of Operation Theater, infection register of surgical dressing room, neonatal admission register in ICU and birth register of this hospital. Indications for caesarean deliveries were collected from operation list submitted by Gynecologist. Based on the obtained information, it was possible to outline demographic and obstetrical profile, cesarean delivery rate, primary cesarean delivery rate, cesarean delivery indications, maternal and newborn health outcome. The cesarean delivery rate was defined as the number of caesarean deliveries over the total number of live births and expressed as a percentage.⁵ Primary cesarean delivery rate was defined as number of cesarean deliveries over the total number of live births (excluding repeat cesareans) and expresses as a percentage. Cesarean delivery rates were computed by several maternal and newborn characteristics. These were: maternal age, neonatal birth weight and parity. Three categories were used for maternal age: less than 18 years, 18-34 years, and 35 or older. Three groups were also used for neonatal birth weight: less than 2499 grams (low birth weight), 2500-3999 grams, and 4000 grams or more (macrosomia). Parity was divided into two groups: primiparas and multiparas. Health outcome of mothers were assessed based on post-delivery infection, hysterectomy to control bleeding and maternal death. Newborn health outcomes were assessed based on low birth weight and neonate admitted in ICU immediately after birth. Types of surgery as emergency or elective were also evaluated. All data were compiled and analyzed manually.

Results:

During the aforementioned periods, there were 617 deliveries, which included 166 normal vaginal deliveries (NVD) and 451 cesarean deliveries. There were two intrauterine fetal deaths that

delivered by cesarean section. There was exclusion of 23 deliveries because respective records could not be located. Thus study population consisted of 594 women and their newborns. Cesarean delivery rate obtained for the period was 72.05% (cesarean delivery rate including repeat cesarean section). Two hundred and seventy two patients underwent primary cesarean section (i.e. with no history of previous cesarean section). Primary cesarean delivery rate is 45.79%.

The study population was characterized by 96.46% (573/594) within 19-34 years of age with 45.79% (272/594) single parity and 88.71% (527/594) full term pregnancy (Table-I). Majority of the patients underwent cesarean deliveries were multipara within fertility age and delivered baby with normal neonatal weight (Table-II). But primary cesarean deliveries were mostly among primipara of fertility age and with normal neonatal birth weight (Table-III).

Previous cesarean delivery itself constituted more than one third [36.45% (156/428)] indications for CD (Table-4). Increase incidence of maternal and neonatal morbidity was observed following cesarean delivery rather than normal vaginal delivery (Table-V). Majority [57.94% (248/428)] of the cesarean delivery was performed during day time working hour as an emergency and 36.92% (158/428) fasted less than 8 hour.

Table-I Demographic and Obstetric Profile

	Cesarean Delivery (n=428) (%)	Normal Vaginal Delivery (n=166) (%)	Total (n=594) (%)
Maternal Age (years)			
≤ 18	01 (0.24%)	01 (0.60%)	2 (0.34%)
19-34	412 (96.26%)	161 (96.99%)	573 (96.46%)
≥ 35	15 (3.50%)	04 (2.41%)	19 (3.20%)
Parity (no)			
0	149 (34.81%)	71 (42.77%)	220 (37.04%)
1	205 (47.90%)	67 (40.36%)	272 (45.79%)
2	65 (15.19%)	25 (15.06%)	90 (15.15%)
3	09 (2.10%)	03 (1.81%)	12 (2.02%)
≥ 4	Nil	Nil	Nil
Gestational Age at Time of CD (weeks)			
< 37	55 (12.85%)	10 (6.02%)	65 (10.94%)
37-42	371 (86.68%)	156 (93.98%)	527 (88.72%)
> 42	02 (0.47%)	Nil	02 (0.34%)
History of Previous CD			
Yes	156 (36.45%)	01 (0.60%)	157 (26.43%)
No	272 (63.55%)	165 (99.40%)	437 (73.57%)

Note: Majority of patients are within fertility age, with single parity and full term pregnancy.

Table-II Cesarean delivery (CD) by maternal age, parity and newborn birth weight

Cesarean delivery (n=428)	
Maternal Age(years)	
≤ 18	01 (0.23%)
19-34	412(96.26%)
≥35	15 (3.51%)
Parity (no)	
Primipara	149(34.81%)
Multipara	279(65.19%)
Newborn birth weight (Grams)	
<2400	27 (6.31%)
2400-3999	395 (92.29%)
>4000	06 (1.40%)

Note: Majority of the patients underwent cesarean deliveries weremultipara within fertilityage and delivered baby with normal neonatal weight

Table-III Primary cesarean delivery by maternal age, newborn birth weight and parity

	Primipara (n=149)			Multipara (n=123)		
	Maternal Age (years)		Newborn Birth Weight(Grams)	Newborn Birth Weight(Grams)		
	<2400n (%)	2400-3999	>4000	<2400	2400-3999	>4000
<18	01 (0.37%)	Nil	nil	Nil	Nil	Nil
18-34	14 (5.15%)	133(48.90%)	01 (0.37%)	04 (1.47%)	109(40.07%)	02 (0.73%)
≤35	Nil	Nil	Nil	01 (0.37%)	07 (2.57%)	Nil
Total	15(5.52%)	133(48.90%)	01(0.37%)	05(1.84%)	116(42.64%)	02(0.73%)

Note: Primary cesarean delivery mostly among primipara of fertility age (18-34) with normal neonatal birth weight

Table-4 Indication of cesarean deliveries

	Primipara (n=149)	Multipara (n=279)	Both primipara and multi para,(n=428)
History of Cesarean Delivery	Nil	156 (36.45%)	156 (36.45%)
Less Foetal Movement	33 (7.71%)	18 (4.21%)	51 (11.92%)
Foetal Distress	24(5.61%)	14 (3.27%)	38 (8.88%)
Pregnancy induced Hypertension	17 (3.97%)	19 (4.44%)	36 (8.41%)
Oligohydromnion	18 (4.21%)	10 (2.34%)	28 (6.55%)
Premature Rupture of Membrane	09 (2.10%)	11 (2.57%)	20 (4.67%)
Bad Obstetrical History	04 (0.93%)	09 (2.10%)	13 (3.03%)
Breech	05 (1.17%)	04 (0.93%)	09 (2.10%)
Big Baby	02 (0.47%)	06 (1.40%)	08 (1.87%)
Subfertility	07 (1.64%)	01 (0.23%)	08 (1.87%)
Failed Induction	05 (1.17%)	02 (0.47%)	07 (1.64%)
Maternal desire	03 (0.70%)	01 (0.23%)	04 (0.93%)
Pain Abdomen	02 (0.47%)	05 (1.17%)	07(1.64%)
GDM	Nil	04 (0.93%)	04 (0.93%)
Unfavourable cervix	06 (1.40%)	Nil	06 (1.40%)
APH	Nil	04 (0.93%)	04 (0.93%)
Post dated	Nil	04 (0.93%)	04 (0.93%)
Others	14 (3.27%)	11 (2.57%)	25 (5.84%)
Percentage of cesarean section	149 (34.81%)	279 (65.19%)	428 (100%)

Note: History of cesarean section itself constituted more than one third indication for cesarean section.

Table-V
Maternal and Newborn Outcome

	Maternal Outcome			Newborn Outcome		
	Wound infection	Hysterectomy to control bleeding	Maternal death	Preterm	Low birth weight	Intensive Care unit Admission
After Cesarean delivery	10 (2.34%)	01 (0.23%)	01(0.23%)	55(12.85%)	27(6.31%)	51(11.92%)
After Normal Delivery	Nil	Nil	Nil	10 (6.02%)	11 (6.63%)	20 (12.05%)

Note: Increase incidence of maternal and neonatal morbidity was observed following cesarean delivery rather than normal vaginal delivery.

Discussions:

Study demonstrated that cesarean delivery rate is much higher than the world health organization's (WHO) recommended rates of between 5 and 15 percent.¹ Controversies are there whether patients' choices or doctors' preferences are more responsible for rising caesarean delivery rates. The literature from different settings indicates that caesarean deliveries are shaped by supply and demand pressures.^{2,3} A supply-driven model imply that greater the capacity of health system to deliver surgical obstetric care, more will be delivered. Such a model suggests that "suppliers" of caesarean delivery (e.g. obstetricians) have substantial influence on delivery mode, and contribute importantly to rising caesarean section rates.⁴ A demand-driven model is consistent with the hypothesis that it is primarily women's choices that determine caesarean delivery rates and service provider who receive financial incentives to intervene surgically.^{4, 5, 6}

In our study only 0.93% (4/428) of cesarean delivery are accounted for patients' choice as indication for cesarean delivery, rest of the indications were determined by obstetrician. In military hospital there is no scope of financial incentives to intervene surgically because treatment is free of cost. Thus high incidence of cesarean delivery rate in our hospital is mostly shaped by supply driven rather than demand driven. It is also true that with the advances in anesthetic services and improved surgical techniques may have wrongly emboldened obstetricians to perform more and more caesarean section. We believe that these factors may have

considerably contributed to the high incidence of cesarean delivery at our hospitals, although further investigation is desirable to prove this assumption.

History of previous cesarean delivery, less foetal movement, foetal distress, pregnancy induced hypertension and oligohydromnion, are accounted for more than two third indication of cesarean deliveries in our hospital. A Royal College of Obstetricians and Gynecologists (RCOG) UK guideline is listed with malpresentation, cephalopelvic disproportion and fetal distress as main indicators for caesarean delivery.⁷ Our indications for cesarean deliveries are not consistent with RCOG-UK guidelines, possibly because of cesarean section indications are labeled clinically rather than using modern guidelines/technologies like partogram, cardiotopograph (CTG) or scalp blood sample monitoring etc. There is also possibility of inter individual variation among obstetrician in selecting indications for cesarean delivery.

More than one third [36.44% (156/428)] indication for cesarean deliveries in our study is due to previous cesarean delivery, which is consistent with a scenario that is more common in developing countries.^{8,9} Previous caesarean delivery is not a recommendation for caesarean deliveries in the guidelines of the RCOG-UK. Currently, the national guidelines for Bangladesh on delivery of patients with history of cesarean delivery is to follow guidelines of World Health Organization (WHO) and Federation of Gynecologists and Obstetricians (FIGO), both of which also do not support a repeat cesarean delivery unless there

is clear indication for this.¹⁰ Vaginal birth after cesarean (VBAC) is not yet practiced in our hospital. However, only one patient had spontaneous VBAC in our study. VBAC is an option provided close labor monitoring facilities are available and the ability to proceed to an emergency caesarean (if needed) is also available.⁷ Further study is necessary to find out the reason for low incidence of VBAC.

Significant number of patients underwent cesarean delivery as an emergency procedure with fasting period of less than 8 hour; as consequence of this, maternal risk for pulmonary aspiration is increased. In a study by Aminu et al. has demonstrated that shortage of staff is the explanation for high incidence (76%) of emergency cesarean deliveries during daytime working hours.⁹ This is supported by the findings of Anwar et al. who reported that the unavailability of both an obstetrician and anesthesiologist when needed is often a reason for high incidence of emergency cesarean delivery in Bangladesh.¹¹ However reason for high incidence of emergency cesarean section in our study was not evaluated. Further study to evaluate the reason for high incidence of emergency cesarean delivery is also necessary.

Compare to normal vaginal delivery, cesarean delivery has higher incidence of postoperative infection, hysterectomy to control bleeding and maternal death. Similarly newborn morbidity in term of preterm deliveries, low birth weight and newborn needed ICU admission is higher after cesarean delivery than normal vaginal delivery. Although indications for preterm deliveries and ICU admission of newborns are not evaluated, our finding is consistent with Althabe F et al. and MacDorman et al.; in that maternal and newborn morbidity and mortality is increased with cesarean delivery, particularly with caesarean section without medical indications.^{12, 13}

Our study has limitation also. We did not evaluate whether cesarean delivery conducted with need or without clinical need. Data presented here is military hospital-based and probably not a representative of cross-section of the overall population. However the strength of our data rests on data collection over an extended period of time and inclusion of large numbers of women from same place. Weaknesses include potential

selection biases because women attending at military hospital are from same class of societies', calculation errors because of missing data and different registration methods used over time. Nevertheless, we are reasonably confident that the figures are at their own interesting and concur with trends in other hospitals in Bangladesh.

High incidence of cesarean delivery and previous cesarean section is the commonest indication for cesarean delivery in our study. Primary cesarean deliveries in our study are mostly among primipara of fertility age. These primary cesarean delivery patients' will be adding in future cesarean deliveries with further pregnancies. Moreover low incidence of VBAC has emerged as a formidable and self-repeating cause of cesarean deliveries. Maternal and fetal morbidity is also increased by cesarean delivery. A concerted action is necessary through an obstetric team (anesthesiologist, obstetrician and neonatologist) round the clock, to offer timely cesarean delivery to women in need and rationale use of cesarean delivery.

Conclusion:

Now attention is needed to focus on strategies to reduce cesarean delivery rate because more is the cesarean delivery, more is the possibility of cesarean delivery with future pregnancies. Moreover a higher cesarean delivery rate does not confer additional health gain, rather increases maternal and neonatal morbidity/mortality. In the face of limited resources, 'excess' cesarean delivery acts as a potent barrier to universal coverage of necessary health services. In a micro perspective, the decision to perform surgical intervention involves interplay between institution, patients as well as obstetrician decision. Thus one of the possible approaches would be, progressively engaging professional associations (Anesthesiologist, Obstetrician and Neonatologist) and health care organizations to formulate a management guidelines in obstetric cases based on further studies from different hospitals. Based on our finding, a more detailed study should be conducted in different hospitals to find the real picture of cesarean delivery at all levels of health care.

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Conflict of Interest Statement: Nil

References

1. Althabe F, Belizan JF. Caesarean section: The paradox. *The Lancet*. 2006; 368:1472-1473.
2. Showalter E, Griffin A. Commentary: all women should have a choice. *BMJ*. 2001; 319:1401.
3. Mazzoni A, Althabe A, Liu NH, et al. Women's preference for caesarean section: a systematic review and meta-analysis of observational studies. *Br J ObstetGynaecol*. 2011; 118:391–399.
4. Leone T, Padmadas SS, Matthews Z. Community factors influencing rising caesarean section rates in developing countries: an analysis of six countries. *SocSci Med*. 2008; 67:1236–1246.
5. Lauer JA, Betrán AP, Merialdi M and Wojdyla D. Determinants of caesarean section rates in developed countries: supply, demand and opportunities for Control. *World Health Report*. 2010;29:1-20.
6. Castro A. Commentary: increase in caesarean section may reflect medical control not women's choice. *BMJ*. 2001; 319:1401-1402.
7. National Collaborating Centre for Women's and Children's Health: Caesarean section: Clinical Guideline. London: RCOG Press; 2004.
8. Khairun N. Indications of Caesarean Section - Study of 100 cases in Mymensingh Medical College Hospital. *Journal of Shaheed Suhrawardy Medical College*. 2009; 1: 6-10.
9. Aminu M, Bettina U, Halim A and Broek NVD. Reasons for performing a caesarean section in public hospitals in rural Bangladesh. *BMC Pregnancy and Child birth*. 2014;14:130.
10. FIGO: FIGO statement on caesarean section. 2007, Available at: <http://www.figo.org/Caesarean.asp>.)
11. Anwar I, Sami M, Akhtar N et al. Inequity in maternal health-care services: evidence from home-based skilled-birth-attendant programmes in Bangladesh. *B World Health Organization*. 2008; 86:252–259.
12. Althabe F, Sosa C, Belizán J, Gibbons L, Jacquerioz F, Bergel E. Caesarean section rates and maternal and neonatal mortality in low-, medium- and high-income countries: an ecological study. *Birth*. 2006; 33:270-277.
13. MacDorman M, Declercq E, Menacker F, Malloy M. Infant and neonatal mortality for primary caesarean and vaginal births to women with “no indicated risk”. *United States, 1998–2001 birth cohorts. Birth*. 2006; 33:175-182.