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CLINICAL ARTICLE

Rate of cesarean delivery at hospitals providing emergency obstetric care in Bangladesh

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ABSTRACT

Objective: To assess the rate of cesarean delivery and its indications at public emergency obstetric care (EmOC) hospitals in a district in Bangladesh. *Methods:* In a retrospective, cross-sectional study, data were extracted from the Safe Motherhood Promotion Project database and operation theater registers for cesarean deliveries at three district and three subdistrict EmOC hospitals in Narsingdi between January 1 and December 31, 2008. Information on cesarean deliveries and their indications, and maternal and neonatal outcomes were analyzed descriptively. *Results:* Among 3329 deliveries, 1075 (32.3%) occurred by cesarean. The frequency of cesarean delivery ranged from 17.8% (147 of 824 deliveries) to 56.3% (174 of 309) among the six hospitals. Information on indications was available for 1043 cesarean deliveries. The main indications were previous cesarean delivery (251 deliveries, 24.1%), fetal distress (228, 21.9%), and prolonged or obstructed labor (214, 20.5%). There were no maternal deaths, but 10 (1.0%) cesarean deliveries resulted in stillbirth. *Conclusion:* The overall rate of cesarean delivery was high at EmOC hospitals. Interventions to improve decision making and limit possible unnecessary cesarean operations are needed.

1. Introduction

Bangladesh has made substantial progress in maternal and child health in the past few decades[1,2]. However, maternal mortality is still unacceptably high at 194 deaths per 100 000 live births [2]. Increasing the availability and use of emergency obstetric care (EmOC) services during pregnancy and for childbirth-related complications are recognized strategies to reduce maternal mortality [3].

Since the 1990s, the government of Bangladesh has been implementing safe motherhood programs, which aim to reduce maternal and neonatal mortality [4]. As a result, the availability of and accessibility to EmOC services have increased substantially, along with the number of cesarean deliveries [5,6]. Population-based data indicate that the frequency of cesarean deliveries increased from 2.7% in 2001 to 12.2% in 2010 [1,2]. The rise in cesarean deliveries could be linked to several factors: better access to health services, delays in seeking services for obstetric complications, increased requests by women, and financial gain and poor decision making by the providers [7].

Cesarean delivery is one of the life-saving provisions—both for the mother and for the newborn—of EmOC services [8]. However, a high cesarean delivery rate is an issue of public health concern. Although cesarean deliveries can be lifesaving, unnecessary procedures represent misuse of resources and could increase the risk of complications for pregnant women and newborns [9–11].

In low-resource countries, the maternal mortality rate after cesarean is approximately six times higher than that in high-resource countries [10]. Maternal morbidities occur after 9.0%–20.0% of cesarean deliveries in low-resource countries [9,10]. The common immediate morbidities associated with the procedure are endometritis, wound infection, wound dehiscence, and hemorrhage [9], whereas the late consequences include increased risk of future spontaneous abortion, preterm labor, retained placenta, postpartum hemorrhage, and reduced fertility [10,12]. Subsequent pregnancies are also associated with an increased risk of scar rupture, the frequency of which is approximately 0.2%–1.5% for a lower segment scar and 4.0%–9.0% for a classic scar [12]. Furthermore, a recent study conducted in Pakistan [11] indicated that there was an increased risk of neonatal death after cesarean deliveries.

In Narsingdi in Bangladesh—a district approximately 55 km northeast of the capital city Dhaka, with a population of 2.26 million—there have been two major interventions to promote maternal and child health: the Safe Motherhood Promotion Project (SMPP) and the Demand Side Financing Project. Implementation of the SMPP was initiated by the government, with support from the Japan International Cooperation Agency, in June 2006. The project included both hospital- and community-based interventions. The hospital-based interventions focused on initiating and maintaining quality comprehensive EmOC services, whereas the community-based interventions included social and community mobilization through awareness building and the development of community support groups.

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The Demand Side Financing Project aims to increase the demand for, and improve accessibility to, obstetric care services among poor pregnant women. The project was implemented in one subdistrict of Narsingdi (Raipura) in May 2007 [13]. Through this project, poor pregnant women receive vouchers for free services at both public and accredited private facilities, such as prenatal care, normal and complicated (including cesarean) delivery, and postnatal care. Additionally, the service providers (including obstetricians and anesthesiologists) receive monetary incentives.

With the implementation of interventions to promote maternal and child health, it is likely that the number of cesarean delivery has increased in Narsingdi. Unnecessary cesarean procedures could be being performed at EmOC hospitals. No previous studies seem to have described the rate of cesareans and the associated indications at public EmOC hospitals in Bangladesh, especially those at the district and subdistrict levels. Therefore, the aim of the present study was to assess the rate of cesarean delivery and its indications at EmOC hospitals in Bangladesh by using data compiled by the SMPP.

2. Materials and methods

The present retrospective cross-sectional study analyzed data obtained from the SMPP database and operation theater registers for cesarean deliveries at EmOC hospitals in Narsingdi, Bangladesh, between January 1 and December 31, 2008. Approval for the study was obtained from the District Managers of Health and Family Planning departments under the Ministry of Health and Family Welfare. Informed consent was not necessary because there was no direct involvement of patients or service providers. Because the study was part of program monitoring and quality improvement, ethical approval from the ethics committee was not necessary.

In 2008, there were eight public hospitals in Narsingdi: three at district headquarters (the District Hospital, Sadar Hospital, and the Maternal and Child Welfare Center), and five at the subdistrict level (Upazila Health Complexes [UHCs]). All the district-level hospitals and three UHCs (Raipura, Monohardi, and Palash) provided comprehensive EmOC services. One of the UHCs (Monohardi) had been providing comprehensive EmOC services since 1993; the other two initiated services in mid-2008.

The present study population comprised women who had a cesarean delivery at the six public EmOC hospitals in Narsingdi district in 2008. The proportion of deliveries conducted by cesarean was calculated from the SMPP database for 2008, and was compared with that for 2006. SMPP monitored the EmOC performance of the district directly by collecting information from all the public hospitals (the number of normal, assisted vaginal, and cesarean deliveries; obstetric complications treated; and the number of maternal and neonatal deaths).

Detailed information for each of the cesarean deliveries in 2008 was obtained from the operation theater registers of the hospitals. Information available in the registers included age, gravidity, parity, type of anesthesia used, physician-documented indications for cesarean delivery, maternal and neonatal outcomes, and birth weight.

Using a specific record sheet, data were extracted directly from the operation theater registers by three SMPP staff (Upazila Coordinators) after a 1-day orientation course in March 2009. Data were cleaned to remove errors, coded, entered onto a computer spreadsheet, and analyzed descriptively using SPSS version 16 (SPSS Inc, Chicago, IL, USA). Data are reported as simple statistics, including numbers and percentages.

3. Results

According to the SMPP database, there were 3329 deliveries in total and 1075 cesarean deliveries in 2008 at the three district hospitals and three UHCs providing comprehensive EmOC services. Detailed information for 1043 of the cesarean deliveries was available from the operation theater registers.

A comparison of the SMPP database between 2006 and 2008 indicated that the overall cesarean delivery rate increased from 16.3% in 2006 (169 of 1038 deliveries; variation among hospitals 1.7%–20.0%) to 32.3% in 2008 (1075 of 3329 deliveries; variation among hospitals 17.8%–56.3%). In 2008, the cesarean delivery rate was highest at the District Hospital (56.3%; 174 of 309 deliveries), followed by Sadar Hospital (38.8%; 242 of 623), the Maternal and Child Welfare Center (35.9%; 377 of 1051), Monohardi UHC (27.3%; 105 of 384), Palash UHC (21.7%; 30 of 138), and Raipura UHC (17.8%; 147 of 824) (Fig. 1).

Among the 1043 cesareans for which detailed information was available, 785 (75.3%) were performed at the three district hospitals. The highest number of cesarean deliveries was recorded at the Maternal and Child Welfare Center (Table 1). Among the UHCs, Raipura performed the highest number of cesarean deliveries (Table 1), even though it started comprehensive EmOC services in only May 2008.

Table 2 summarizes the characteristics of women undergoing cesarean delivery. Most (802, 76.9%) were aged 20–29 years. Approximately half the deliveries were performed for a first pregnancy, and one-third for a second pregnancy (Table 2).

A total of 693 (66.4%) cesarean deliveries were done because of a previous cesarean, fetal distress, or prolonged or obstructed labor (Table 3). The proportions of cesarean deliveries performed because of a previous cesarean or fetal distress were lower at the UHCs than at the district hospitals (Table 3). Prolonged or obstructed labor accounted for the highest proportion of cesareans at UHCs, whereas previous cesarean was the predominant indication at the district hospitals (Table 3). All cesarean procedures were done under spinal anesthesia. Only one patient received a blood transfusion during the operation at the district hospital, and no maternal deaths were recorded during the subsequent hospital stay.

Table 4 summarizes the neonatal outcomes. The ratio of male to female newborns was 1.2. Only 10 (1.0%) cesarean deliveries resulted in stillbirth. Obstetric complications associated with stillbirth were fetal distress (n = 1), obstructed labor (n = 3), postmaturity (n = 1), previous cesarean (n = 2), prepartum hemorrhage (n = 1), and ruptured uterus (n = 2). Only 72 (7.3%) of 989 neonates for whom birth weight was available weighed less than 2.5 kg.

4. Discussion

The present hospital-based study demonstrated that the frequency of cesarean delivery was fairly high (32.3%) at public EmOC hospitals in a district in Bangladesh in 2008. The rate had increased since 2006, which is in accordance with data from national surveys and health management information systems that indicate that the rate of cesarean delivery has been increasing rapidly in Bangladesh over the past 10 years [1,2,6].

The frequency of cesarean varied at each public EmOC hospital in the district. The rate of cesarean was highest (56.3%) at the District Hospital, which might be because this center receives a high number of referral

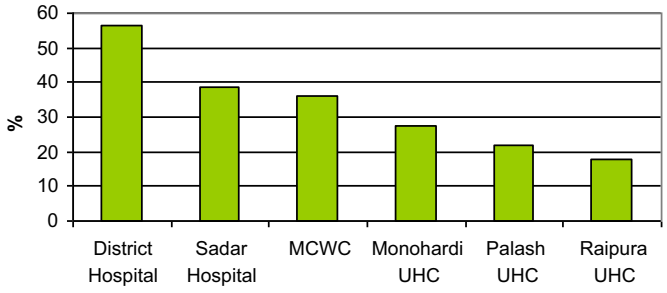

Fig. 1. Rate of cesarean delivery at EmOC hospitals. Abbreviations: MCWC, Maternal and Child Welfare Center; UHC, Upazila Health Complex.