

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20230300>

## Original Research Article

# Incidence and risk factors associated with caesarean section among Bangladeshi women: a retrospective cross-sectional study

Sohelee Nargis<sup>1\*</sup>, Rabea Khatun<sup>1</sup>, Kakali Saha<sup>2</sup>, Shilpi Saha<sup>2</sup>

<sup>1</sup>Department of Obstetrics and Gynaecology, Kumudini Women's Medical College, Mirzapur, Tangail, Bangladesh

<sup>2</sup>Department of Obstetrics and Gynaecology, Medical College for Women and Hospital, Uttara, Dhaka, Bangladesh

**Received:** 28 December 2022

**Accepted:** 31 January 2023

### \*Correspondence:

Dr. Sohelee Nargis,

E-mail: [soheleenargis@gmail.com](mailto:soheleenargis@gmail.com)

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## ABSTRACT

**Background:** Caesarean section is a lifesaving procedure in the presence of maternal and fetal complications. In recent decades the rate of caesarean section is increasing rapidly due to several associated risk factors. The objective of this study was to assess the prevalence and associated risk factors of C-sections among women at Kumudini Women's medical college.

**Methods:** This retrospective cross-sectional study was conducted at the department of obstetrics and gynaecology in Kumudini Women's Medical College, Tangail, Bangladesh. The study was conducted during the period of July 2019 to January 2020. The total sample size this study was 2105.

**Results:** Majority 696 (33.1%) of participants were aged between 18-24 years and followed by 464(22%) aged 25-30, 569 (27%) aged 31-35 and the rest 376 (17.9%) were aged 36-40 years. A significant association was noticed in respect of previous history of CS, gestation age and fetal weight with the type of delivery (p value, 0.000, 0.033, 0.021). whereas in parity there was no significant relationship with caesarean section (p value, 0.421). A significant association was noticed in respect of pre-eclampsia, eclampsia induction failure, fetal distress, APH, twin, malpresentation, and the type of delivery (p value, 0.02, 0.003, 0.001, 0.001, 0.002, 0.04, 0.03 and 0.1). Whereas in PROM there was no significant relationship with caesarean section (p value=0.1).

**Conclusions:** This study concludes that the incidence of caesarean sections is seemed to be very high in Bangladesh. Although it is a life-saving procedure, it is important to choose carefully when performing a C-section birth.

**Keywords:** Risk factors, Caesarean section, Eclampsia, Fetal weight

## INTRODUCTION

During a caesarean section (C/S), the mother's abdomen and uterus are cut through to deliver babies.<sup>1</sup> It is one of the most vital life-saving methods which is essential in lowering the incidence of maternal and perinatal morbidity and mortality. A caesarean section (C/S) can be carried out in either an emergency or an elective manner, according to the circumstances. Elective C/S is carried out throughout the pregnancy at a predetermined time to ensure the best obstetric care, anesthetic care, newborn resuscitation, and nursing care. On the other hand, emergency C/S is carried out when a significant obstetric emergency poses a risk to

the mother and the unborn child's life.<sup>2-4</sup> In 1985, members of the study committee for the World Health Organization wrote, any place where the rate of caesarean sections is greater than 10% to 15% is not justifiable.<sup>5</sup> Despite this guidance, studies indicate that there is significant regional and national variance in the rates of CS, which are high in poor countries and rising.<sup>6</sup> With an average yearly growth rate of 3.7% between 2000 and 2015, the global C-section rate increased to 21.1% of all births in 2015.<sup>7</sup> Between 2000 and 2015, the number of C-sections performed in south Asia doubled, with average yearly growth rates above 5%.<sup>7</sup> In this region, the C-section rate exceeded the WHO-recommended upper limit of 15% of all deliveries

in 2015, reaching 18.1%.<sup>8-10</sup> The C-section rate in Bangladesh has increased dramatically over the past 20 years, going from 3% in 2001 to 33%.<sup>11,12</sup> The significant rise in caesarean sections, however, is related to various circumstances. The number of C-sections performed on women in Bangladesh is significantly connected with their regular antenatal care (ANC), the presence of health issues during pregnancy and labour, and the kind of birthing facility used.<sup>13-17</sup> Moreover, severe maternal morbidity and mortality are mostly seen among women undergoing an emergency caesarean section in comparison with the previously planned caesarean section.<sup>18,19</sup> Preeclampsia, eclampsia, increasing maternal age, preterm delivery especially when the gestational age is less than 30 weeks, previous abdominal surgery (other than CS), and multiple pregnancy have also been documented as risk factors for caesarean section.<sup>20</sup> Caesarean section delivery is also associated with abnormal placentation, adhesions, preterm birth especially when the previous CS was done during the second stage of labour and scar complications which includes postmenstrual spotting, endometriosis, uterine scar pregnancy, numbness and pain.<sup>21,22</sup> However, evidence suggests that even when there is no clinical justification for a C-section, women's personal preferences have a significant impact on the choice.<sup>23,24</sup>

**Objectives**

The objective of this study was to assess the prevalence and associated risk factors of C-sections among women at Kumudini women's medical college.

**METHODS**

This retrospective cross-sectional study was conducted at the department of obstetrics and gynaecology in Kumudini women's medical college, Tangail, Bangladesh. The study was conducted during the period of July 2019 to January 2020. The total sample size this study was 2105.

**Inclusion criteria**

All pregnant women aged between 18-40 years who were admitted in the hospital for the delivery purpose were included in this study.

**Exclusion criteria**

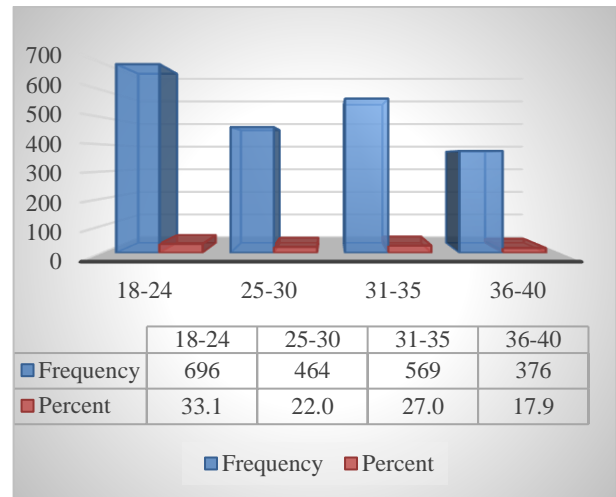
Pregnant women with chronic disease, history of surgeries other than caesarean sections, and incomplete clinical history were excluded from this study.

The hospital's record for obstetrics and gynecology department provided all the data required for this study. Information about the delivery method, the cause for a caesarean section, clinical and epidemiological data, as well as the pregnant woman's demographics, were all necessary for this study. The analysis was performed using the SPSS version 25. Both descriptive and inferential statistical methods were applied. For the inferential

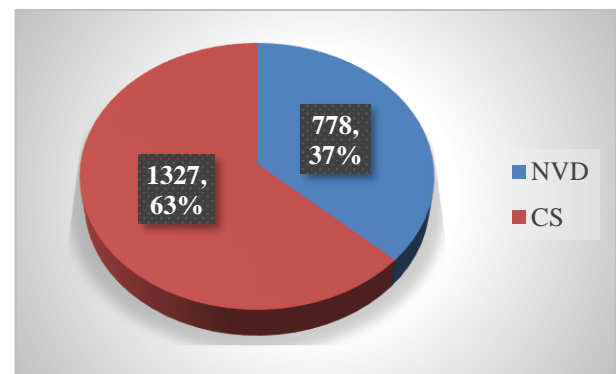
analysis, the association between the dependent variable, demographic characteristics, and caesarean delivery indications was examined using the Chi-square test whereas the significance level was set at 0.05.

**RESULTS**

Majority 696 (33.1%) of participants were aged between 18-24 years and followed by 464 (22%) aged 25-30, 569 (27%) aged 31-35 and the rest 376 (17.9%) were aged 36-40 years.



**Figure 1: Age distribution of the study patients.**



**Figure 2: Type of delivery among the study patients.**

Due to several sociodemographic characteristics caesarean delivery was more prevalent 1327 (63%) whereas normal vaginal delivery was conducted in 778 (37%) cases. A significant association was noticed in respect of previous history of CS, gestation age and fetal weight with the type of delivery (p value=0.000, 0.033, 0.021). Whereas in parity there was no significant relationship with caesarean section (p value=0.421). A significant association was noticed in respect of pre-eclampsia, eclampsia induction failure, fetal distress, APH, twin, malpresentation, and the type of delivery (p value=0.02, 0.003, 0.001, 0.001, 0.002, 0.04, 0.03 and 0.1). Whereas in PROM there was no significant relationship with caesarean section (p value=0.1).

**Table 1: Association between clinical presentation and type of delivery.**

Variable	NVD		CS		P value	
	N	%	N	%		
Parity	Primigravida	276	35.5	494	37.2	0.421
	Multigravida	502	64.5	833	62.8	
Previous history of CS	Yes	0	0	717	54	0.000
	No	778	100	610	46	
Gestation age (weeks)	<37	63	8.1	148	11.2	0.033
	37-42	652	83.8	1053	79.4	
	>42	63	8.1	126	9.5	
Fetal weight (g)	<2500	261	33.5	577	43.5	0.021
	2500-4000	514	66.1	720	54.3	
	>4000	3	0.4	30	2.3	

**Table 2: Association between complication and type of delivery.**

Variable	NVD		CS		P value	
	N	%	N	%		
Preeclampsia	Yes	24	3.1	180	13.6	0.02
	No	754	96.9	1147	86.4	
Eclampsia	Yes	12	1.5	112	8.4	0.003
	No	766	98.5	1215	91.6	
Induction failure	Yes	0	0.0	278	20.9	0.001
	No	778	100.0	1049	79.1	
Fetal distress	Yes	0	0.0	252	19.0	0.001
	No	778	100.0	1075	81.0	
APH	Yes	0	0.0	127	9.6	0.002
	No	778	100.0	1200	90.4	
Twin	Yes	7	0.9	35	2.6	0.04
	No	771	99.1	1292	97.4	
Malpresentation	Yes	5	0.6	118	8.9	0.03
	No	773	99.4	1209	91.1	
PROM	Yes	36	4.6	76	5.7	0.1
	No	742	95.4	1251	94.3	

## DISCUSSION

A caesarean section can save the mother and the unborn child's lives. Delay in decision could hurt both mother and fetus. On the other side, making the wrong decision might result in higher morbidity and mortality rates. This study's objectives were to find out how common caesarean sections are in Bangladesh and what cause them. The WHO critical threshold of C/S (15%) for any country was exceeded by the overall prevalence of C/S at 39.1%.<sup>25</sup> According to the current study, women between the ages of 18 and 24 had a greater C/S rate than mothers between the ages of 31 and 35. This result was consistent with research conducted by Zainab et al in Abu Dhabi, United Arab Emirates.<sup>26</sup> A comparable study carried out in Tahiran, Iran, revealed a substantial correlation between C/S and maternal age.<sup>27</sup> On the other hand, research by Farhana et al and Hiwot et al revealed that age does not significantly affect the rate of C/S.<sup>28,29</sup> According to this study, mothers who have had C/S in the past are far more likely to have it again than mothers who have not though there is a scope of VBAC. This result is consistent with a

number of other research.<sup>1,26,30</sup> In this study, compared to multigravida, primigravida women had a higher proportion and were at a higher risk of CS delivery. Studies in the United States and Nepal have produced findings that are similar.<sup>31,32</sup> The optimal rate of cervical collagen fiber disintegration may be more difficult to achieve in primigravida women than in women with many pregnancies because they lack labour experience.<sup>33</sup> We discovered that a high birth weight delivery posed a CS delivery risk. These results are analogous to those of a Dutch study that found that babies with high birth weights had a doubled probability of having a CS delivery after an IOL.<sup>34</sup> Similar to this, a study conducted in Saudi Arabia and Ethiopia found that mothers with large babies had a higher chance of CS delivery than did mothers of babies of normal weight.<sup>35</sup> Shoulder dystocia, which occurs when the baby's anterior shoulder becomes trapped above the mother's pubic bone and can result in complications such as brachial plexus injury or clavicle fracture, vaginal tears, and excessive bleeding, may be responsible for the increased risk of CS on high birth weight infants. This blockage ultimately causes vaginal birth to fail,

necessitating an urgent CS delivery.<sup>34</sup> Additionally, it is widely accepted that placental function begins to diminish beyond 40 weeks of pregnancy, subjecting the fetus to an environment that is less than ideal due to acidosis, polycythemia, meconium aspiration, and cephalopelvic disproportion. These elements could need an urgent caesarean birth.<sup>36</sup> In this study, a significant association was noticed between pre-eclampsia, eclampsia and CS (p value, 0.000, 0.001). Also, induction failure, fetal distress, APH, twin and malpresentation are also found to be the significant risk factors for CS (p values=0.02, 0.02, 0.001, 0.02 and 0.001). Numerous studies have also reported these factors as the significant leading cause for caesarean section. In contrast to our study, a related study found that the PROM ended more frequently with caesarean sections (20%) than vaginal deliveries (8%).<sup>37</sup> In another study, Chavarry et al found prior caesarean section were the more common causes for caesarean section with percentages of 28%, 21%, and 11%, respectively for cephalopelvic disproportion (CPD), acute fetal distress (AFD), and placenta praevia.<sup>38</sup> Hathout et al in their study reported that a significant association of caesarean section with previous CS (40%) and abnormal presentation 8.9%, whereas severe preeclampsia (5.34%), PROM 4.19% and twins 2.67% also had some association with CS.<sup>39</sup> In relation with our study, Tsegaye et al also found previous CS in 27.2%, malpresentation 10.5%, severe preeclampsia 7%, induction failure 7% which also had a significant association with CS.<sup>29,39</sup> Sinchitullo-Castillo et al also reported some risk factors for CS where 13.4% women had previous CS, 8.2% had PROM with infection and 4% presented with pre-eclampsia.<sup>40</sup> So, it is evident that the risk factors reported in this present study is in line with the international standards as results from other studies has almost the same finding like ours.

## CONCLUSION

In this study, the prevalence of caesarean sections appeared to be high. Age of the women, parity, prior caesarean section history and association of different risk factors were strongly linked to a higher incidence of caesarean section. The health system is burdened by a rise in the number of caesarean deliveries. Unnecessary caesarean deliveries strain the family and could be harmful to the health of the mother and the baby. Therefore, it is important to choose carefully when performing a C-section birth.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Nargis S, Khatun R, Saha K, Saha S. Incidence and risk factors associated with caesarean section among the Bangladeshi women: a retrospective cross-sectional study. *Int J Reprod Contracept Obstet Gynecol* 2023;12:515-9.