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A Clinical Analysis of Blood Transfusion Practices in Caesarean Sections with Varied Indications

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Abstract

Background: The pregnant uterus has one of the greatest blood supplies than any other organ in the body. When uterus is surgically opened to perform caesarean section, a number of large blood vessels are cut. While the average blood loss for a vaginal birth is about 500cc, the average blood loss with caesarean section is almost double and may require blood transfusion. This study identified frequency of the blood transfusion among the patients undergoing caesarean section with various indications. The aim of this study was to ascertain the frequency of blood transfusions among patients undergoing Caesarean sections with various indications. **Material & Methods:** This cross-sectional study and was conducted in the Department of Obstetrics & Gynaecology of Bangabandhu Seikh Mujib Medical University (BSMMU) Hospital, Dhaka, Bangladesh during the period from September 2012 to February 2013. **Results:** In this study a total 96 caesarean sections were observed, the mean age of the patients was 29.88 ± 3.14 years. About 26.04% of patients required blood transfusion, with different indications of cesarean sections including placenta praevia (83.33%), malpresentation (66.66%), obstructed labor (33.33%), and previous caesarean section (18.75%). Only 4% of transfused patients experienced a mild febrile reaction. **Conclusions:** Frequency of blood transfusion was high (26.04%) during caesarean sections. Preoperative anaemia, quantitity of blood loss and various indications of caesarean sections were the considering factors for the blood transfusions during caesarean sections. Placenta praevia was the most common indications of blood transfusion during caesarean sections. Efforts should be made to reduce the blood transfusion without increasing maternal morbidity and mortality to reduce hazard of blood transfusions blood born infections, like HBV, HCV & HIV infections that are more prevalent in developing countries like ours.

Keywords:- Blood Transfusion, Caesarean Section, Varied Indications.

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INTRODUCTION

Peripartum haemorrhage is still the leading cause of maternal and fetal morbidity and mortality in developing countries. Despite advances in the prevention, diagnosis and treatment, massive blood loss during pregnancy and delivery remains a threat and therefore, prevention of maternal mortality involves prompt blood transfusions among other life saving measures to attain the fifth millennium development goal.[1]

The advent of blood transfusion services has undoubtedly played a crucial role in reducing mortality associated with blood loss during Caesarean deliveries. However, as surgical techniques and practices continue to advance, it becomes imperative to critically evaluate the current blood transfusion practices associated with Caesarean sections. This includes a thorough examination of the necessity and indications for blood transfusion during and after the procedure. By reevaluating these practices, healthcare professionals can ensure that interventions are aligned with the latest advancements, optimizing patient outcomes and safety during and after Caesarean deliveries.[2]

After 28 weeks of pregnancy, a Caesarean section is performed to deliver the baby through the abdominal route. In recent years, over one third of all babies in the United States have been delivered via caesarean section (29.1%).[1] Khawaja et al. conducted an analysis of data from Sir Ganga Ram Hospital in Lahore for the year 2001 and found that the Caesarean section rate was 21.07%.[3] According to a survey of the literature, the rate of cesarean section in tertiary care hospitals in Pakistan ranges from 17.8% to 31.2%.[4] In a cross-sectional study conducted from January to December 2004 at Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, the total cesarean section rate was 57.87%.[5] The pregnant uterus boasts one of the most extensive blood supplies among all organs in the body. During a Caesarean section, when the uterus is surgically opened, several major blood vessels are severed. While a vaginal birth typically involves an average blood loss of around 500cc, a Caesarean section tends to double that amount, often necessitating a blood transfusion. Unbooked patients are six times more likely to require a blood transfusion during a Caesarean section compared to women who received antenatal care. Similarly, grand multiparous women are at a higher risk of intra-operative transfusion during Caesarean section.[6]

According to a review of the existing information, the necessity for transfusion differs by country. For instance, in Thailand, only 2.2% of patients undergoing Caesarean sections required a blood transfusion,[7] while in Canada, the figure was 5.7%,[8] and in Nigeria, it was 8.9%.[9] The study from Aga Khan University, involving 126 patients undergoing Caesarean sections, found that 15% of the patients required a blood transfusion. These differences could be influenced by factors like healthcare practices, accessibility to medical resources, and population health characteristics in each country.[10]

In another research in Pakistan,[11] the distribution of cases by indication of blood transfusion in caesarean section indicated placenta praevia in 90 patients (56.0%),

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obstructed labor in 34 patients (21.0%), prior caesarean section in 24 patients (15.0%), and preeclampsia in 12 patients (7.5%). In Nigeria,[12] the transfusion rate was 25.2%. The common indications for transfusion include placenta praevia, (59.1%), obstructed labor (28%), prior caesarean sections (17%) and preeclampsia (11.1%). Different indications of caesarean sections, pre-operative anemia, and blood loss during caesarean section were all major risk factors for blood transfusion. To date limited study is available in our country on this issue. The aim of this study was to determine the frequency of blood transfusions for different indications during caesarean sections. Effective patient educations and proper efforts might be ensured to minimize blood transfusion during antenatal care if high risk patients for blood transfusion could be identified early.

Objectives

The objective of the study was to ascertain the frequency of blood transfusions among patients undergoing caesarean sections with various indications.

MATERIAL AND METHODS

This was a cross-sectional study and was conducted in the Department of Obstetrics & Gynaecology of Bangabandhu Seikh Mujib Medical University (BSMMU) Hospital, Dhaka, Bangladesh during the period from September 2012 to February 2013.

A total of 96 consecutive cases of caesarean section admitted in department of obstetrics and gynaecology were included in the study. The records of all cases of Caesarean delivery carried out during the study period were retrieved. Information extracted from the records included demographic parameters of the patients, past obstetrics history, booking status, indication for caesarean section, interval between decision and delivery time, neonatal outcome, special care baby unit's admission and blood transfusion parameters. The operating theatre records as well as data relating to the number of deliveries during this study period were obtained and reviewed. Booked cases were those patients that registered and accessed antenatal care in the Department of Obstetrics and Gynaecology BSMMU, hospital.

Statistical Analysis: All data were recorded systematically in preformed data collection form and quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was carried out by using Statistical analysis was done by using SPSS (Statistical Package for Social Science) Version 26 for windows 10. P value <0.05 was considered as statistically significant. Ethical clearance was obtained from Institutional Review Board (IRB) of BSMMU to undertake the current study.

RESULTS

A total 96 case was recorded. Mean age of the patient was 29.88 ± 3.14 yrs. Most of the patients were in 31-35 years of age group, most of the patients were multiparous, Preoperative hemoglobin of most of the patients were within 7-8 gm/dl [Table 1].

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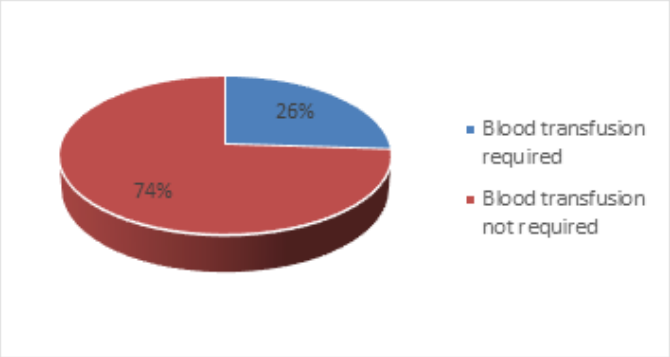

Figure 1: Distribution of patients required blood transfusion in caesarean section

About 26 % of our patient required blood transfusion [Figure 1].

The most common indications of caesarean sections were previous caesarean sections (33.33%), Blood transfusion was mostly required in placenta previa (83.3%) shown in [Table 2].

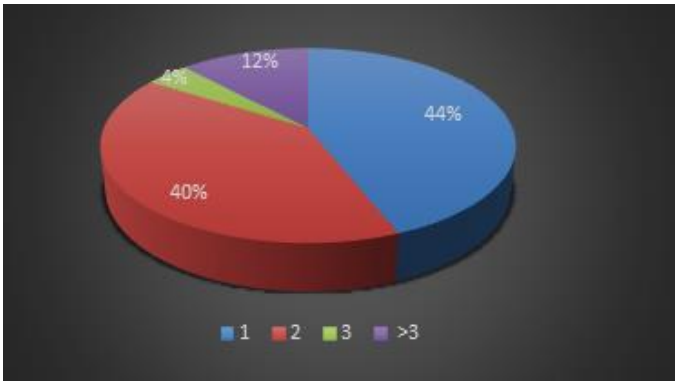

Figure 2: Distribution of required unit of transfusion among the patients with caesarean section

Only one unit blood transfusion was required most of the patients (44%) Shown on [Figure 2].

Table 1: Baseline characteristics of the respondents

Characteristics		**Number**	**Percentage**
Age	20-25	13	13.54
	26-30	37	38.54
	31-35	43	44.79
	36-40	3	3.13
	29.88 ± 3.14		
Parity	Primi gravida	9	9.38
	Para 1-2	22	22.92
	Para 3-4	20	20.83
	Para >4	45	46.87
Haemoglobin level (gm/dl)	>8	9	36
	7-8	12	48
	<6.9	4	16

Table 2: Distribution of caessaren section and required transfusion

Different indications of caesarean sections			**Required unit of blood transfusion**	
Indications	**Number**	**Percentage**	**Number**	**Percentage**
Breech	5	5.21	1	20
Previous caesarean section	32	33.33	6	18.75
Fetal distress	16	16.66	2	12.5

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Pre-eclampsia	8	8.33	1	12.5
Placenta praevia	12	12.5	10	83.33
Prolonged labour	3	3.13		
Induction failure	2	2.08		
PROM	2	2.08		
CPD	4	4.17		
Cervical dystocia	2	2.08		
Obstructed labour	3	3.13	1	33.33
Malpresentation other than breech	3	3.13	2	66.66
Post dated pregnancy	4	4.17		

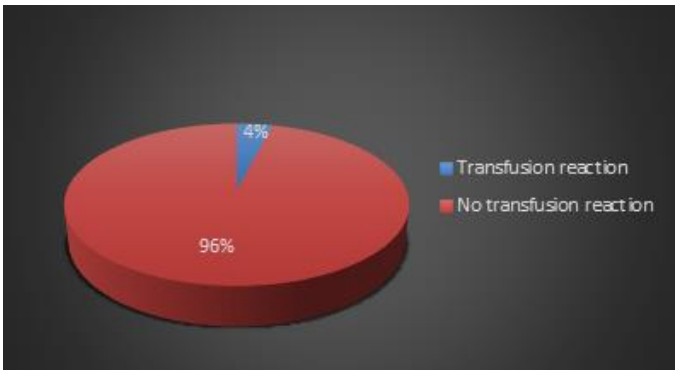

Figure 3: Distribution of transfusion reaction among required transfusion during caesarean section.

Out of 25 blood transfused patients only 4 % patients had transfusion reactions shown in [Figure 3].

DISCUSSION

Caesarean section is the delivery of baby through abdominal route after 24 weeks of gestation. Caesarean section rates have increased very rapidly over the past two decades both in developing and the developed countries.[13] The age of the patients with caesarean section in our study were ranged from 20-40 years. The mean age was 29.88 ± 3.14 (Mean ±SD) years. The highest number patients were in the 31-35 years group. Eusaph Z.A.et al,[11] in Pakisthan found mean age 31.9 + 2.3 years. In a study in Nigeria conducted by Ozumba,[14] age of most of the patients were between 26 and 37 years, which were almost similar to our population. Distribution of parity showed, 9 (9.38%) primigra-vida, 22 patients (22.92%) were para 1-2, 20 patients (20.83%) were para 3-4 and 45 patients (46.87%) were para >4. Distribution of parity in the study of Eusaph Z.A.et al,[11] were 14 (8.7%) primigravida, 36 patients (22.5%) were para 1-2, 34 patients (21.3%) were para 3-4 and 76 patients (47.5%) were para 5-7. This finding was almost correlated to our study. In this study Hb level was <6.9 g/dl in 04 cases (16%); it was between 7 g/dl and 8 g/dl in 12 cases (48%) and >8 g/dl in 9 cases (36%) whereas Ozumba14 found in his study Hb <6.9 gm/dl in 16.2% cases ; in between 7 g/dl and 8 g/dl in 48.7% cases and > 8 gm/dl in 41 35.1% cases which was almost similar to our study population. In this study distribution of indication caesarean section showed Breech presentation in 5.21% cases, previous caesarean section in 33.33% cases, Fetal distress in 16.66% cases, Preeclampsia in 8.33% cases, Placenta praevia in 12.5% cases, prolonged labour in 3.13% cases, induction failure in 2.08% cases, PROM in 2.08% cases, CPD in 4.17% cases,

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Cervical dystocia in 2.08% cases ,Obstructed labour in 3.13% cases, Malpresentation other than breech in 3.13% cases, Postdated pregnancy in 4.17% cases. Nazneen,[15] in Bangladesh found Breech presentation in 4.1% cases, previous caesarean section in 31.4% cases, Fetal distress in 15% cases, Preeclampsia in 7.8% cases, Placenta praevia in 2.6% cases, prolonged labour in 4.6% cases, induction failure in 2.6% cases, PROM in 2.6% cases, CPD in 4.0% cases, Cervical dystocia in 2.6% cases, Obstructed labour in 0.4% cases, Malpresentation other than breech in 3.13% cases, Post dated pregnancy in 2.8% cases. Ozumba14 found Breech presentation in 5.40% cases, previous caesarean section in 30.45% cases, Fetal distress in 6.05% cases, Preeclampsia in 9.72% cases, Placenta praevia in 10.58% cases, Malpresentation other than breech in 1.30% cases, Post dated pregnancy in 4.17% cases. These findings can be considered as all most similar to our study. The blood transfusion rate of 26.04% is almost similar to 25.2% found in a study in Nigeria but high compared with the 4.95% and 9.4% found in similar studies in Britain and New Zealand, respectively done by Duthie et al,[16] 1992; Maxwell17 1989, but only slightly higher than 23.5% found by Rainaldi et al (1998).[18] In a study of blood transfusion in obstetric practice in Lagos, Nigeria, the overall transfusion rate was 12.1%,[19] and In Pakistan at Aga Khan University the blood transfusion rate was 13%11 in 2003 which is lower than the 26.04% in this study. This high transfusion rate may be explained by the high incidence of emergency cases, such as obstructed labour and the relatively large number of cases of placenta praevia. It is also pertinent to note that many of the patients had only 1unit of blood. These patients could have survived with plasma expanders instead of 1 unit of blood, with its attendant risk and complications. In the present study, approximately 5.43% of the participants received blood transfusion; this rate was drastically lower than the reported rate from other resource poor countries, which averaged around 12.5 and 22.5.[14,20] In another study by Imarengiaye and Ande,[21] grandmultiparous women were associated with increased risk of intraoperative transfusion during cesarean section. A higher incidence of conditions, like anemia and placenta previa in the multiparous population makes them more likely to receive blood transfusion,[19,22] as also seen in our study. In the present study, lower preoperative hemoglobin (mean 9.14 g/dL vs 10.75 g/dL) in women was more likely to be associated with blood transfusion with cesarean delivery. A similar observation was made by Rouse et al,[23] who found that mild anemia (hematocrit 25–29%) was a significant factor for blood transfusion in both primary and repeat cesarean sections (OR 3.4, 95% CI 2.8–4.2 and OR 3.8, 95% CI 3.1–4.6, respectively). In India, 70% of women who received a blood transfusion during or after CS had no antenatal care.24 Unregistered patients are more likely to present as an emergency and undergo CS than women who have regular antenatal visits and are therefore more likely to require blood transfusion.[25,26] Distribution of cases by indication of blood transfusion in caesarean section of Eusaph Z. A. et al,[11] al showed placenta praevia in 90% patients, previous caesarean section in 15.0% patients and obstructed labour in 21.0% patients wherase in study of Ozumba,[12] placenta previa was in 59% cases, previous caesarean section in 17%

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cases, obstructed labour in 28% cases, malpresentation other than breech in 67% patients, breech presentation in 32 % cases, other in 10 % cases. In our study distribution of cases by indication of blood transfusion in caesarean section showed placenta praevia in 83.33% patients, Malpresentation other than breech in 66.66% patients Obstructed Labour in 33.33% patients and previous caesarean section in 18.75% patients. This finding was accordance with the above studies. In this study a majority (11) of the transfused patients had only 1 unit of blood (44%), followed by those (10) transfused with 2 units (40%); others (1) had 3 units (4%) and 3 (12%) had >3 units whereas Ozumba [14] found A majority of the transfused patients had only 1 unit of blood 43.1%, followed by those transfused with 2 units 40.5%; others had 3 units 6.9% and 9.5% had 4 units which can be considered as similar to our study. In this study among the total transfused patients (25) only 1 patient (4%) showed mild febrile reaction, no fatal reaction was found. In a study in BSMMU,Dhaka conducted by Chowdhury FS[27], 8 (6.66%) patients showed reactions of different types. Among them febrile reaction was 5 (62.5%), allergic reaction was 2 (25%) and 1 (12.5%) developed pulmonary congestion (Transfusion Related Acute Lung Injury), characterized by cough, shortness of breath and increase rate of respiration and no fatal reaction observed during her study period. These findings can be considered as similar to our study, though other reactions were not observed most likely it was due to small number of sample size.

Limitations of the study

Our study was a single centred. We could only study blood transfusion practices in caesarean sections with varied indications. As a small number of patients were studied so findings of this study should be cautiously extrapolated into the broader context.

CONCLUSIONS

In conclusion, the blood transfusion rate was very high (26.04%) but could be reduced. The indications for caesarean section, preoperative anaemia and the quantity of blood loss during caesarean section were considered for blood transfusion. Efforts should be made to reduce the need for blood transfusion, without increasing maternal morbidity and mortality. It can be done by creating the awareness at basic health level and ensuring the early referral to tertiary care center.

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