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Original Article

Risk Factors of Blood Transfusion during Caesarean Delivery in Rural Area of Sindh

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Abstract

Introduction: Hemorrhage is a leading cause of maternal deaths; particularly in developing countries. Bleeding in pregnant ladies is an indication of blood transfusion with all its attended risk.
Objective: This study was conducted to identify the factors necessitate blood transfusion during cesarean section.
Methodology: A total number of 2855 of pregnant women scheduled for emergency cesarean section or elective cesarean section at Bhurgri Hospital, rural area of Sindh, between July 2014 and December 2017. Participant were followed from the date of admission to the date of discharge and then for two weeks. Preoperative Hb level and the need for blood transfusion, clinical experience of obstetrician, indication for caesarean section, primary or repeat caesarean section and status of HBsAg/HCV were assessed.
Results: A total of the numbers of 4823 patients had deliveries from July-2014 to Dec-2017.Among them, 2855 patients underwent cesarean delivery, the ratio of cesarean section was recorded as 59.19%. All pregnant women who underwent cesarean delivery selected for our study. The mean age of the women who had surgery was 26 years.
Conclusion: Preoperative anemia, increasing parity, severe blood loss at surgery and status of HBs/HCV significantly contributes to require for blood transfusion in pregnant women undergoing a surgery (cesarean section).

Keywords: Caesarean section, Blood product transfusion, Risk factors, Anemia, HBs, HCV.

Introduction:

Intra-operative and post-operative bleeding is a major risk during for blood transfusion. Hemorrhage is a leading cause of maternal deaths; particularly in developing countries.[1] Bleeding in pregnant ladies is an indication of blood transfusion with all its attended risk. Factors predisposing to increased risk for blood transfusion known from previous studies include preoperative low hemoglobin, previous Caesarean Delivery, ante partum bleeding[1,2]. However, other factors that may significantly increase blood loss during surgery such as the presence of co-morbidities, placenta abruption, hepatitis B or C positive and multiparty. Low hemoglobin in pregnancy is common in our area, a prevalence of 25-30% is reported.[3,4] In different studies it has been shown that severe ante partum bleeding from causes such as placenta abnormalities can lead to low hemoglobin (anemia) and are significantly associated with blood loss with an increased risk of blood transfusion during cesarean section.[5,6] Blood arrangement and blood products are major challenges in rural area of Sindh. Scanty facility of blood banking, lack of awareness for blood donation, poverty and religious issues are major factor.[7] This study is carried out to determine risk factors associated with the blood transfusion in patients who underwent caesarean delivery at our institution. In addition, we also compared blood transfusion

rates in HBV/HCV negative patients with HBV/HCV positive patients.

Methodology:

This study is carried out in rural area of Sindh at Bhurgri Hospital. Majority of the pregnant women presented without proper antenatal and referred to the hospital mostly at late night hours in an emergency. All women who underwent cesarean delivery were enrolled for participation; however, a total of 2855 pregnant woman who underwent CS were recruited using non-probability sampling method. Written informed consent was obtained from patients. Data were collected over a four-year period from July 2014 to Dec 2017. Participants were followed-up from the date of delivery to discharge and then for two weeks.

The dependent variable was the patient's blood transfusion status, intra operative or postoperatively, was categorized into two; blood transfusion received or not received. The estimation of blood loss during the cesarean section was done by visual inspection of volume of blood in the suction bottle, abdominal packs and the number of soaked gauze pieces. The requirement for the blood transfusion in an individual patient was determined by the estimated blood loss and the clinical status of the participant. Chi-square method was used to know the blood transfusion rate, if there exists an association between blood transfusion status and preoperative Hb level, indication for caesarean section, primary or repeat caesarean section and status of HBs Ag/HCV antibodies.

Results:

A total of 4823 patients were had deliveries during period of the study. Among them, 2855 patients underwent cesarean delivery; the rate of cesarean delivery was recorded as 59.19%. All pregnant women who underwent cesarean delivery (CS) selected for our study. The average age of the women who had surgery was 26 years. Among 2855 patients who were recruited during the study, 1818 (63.68%) had emergency CS while 1037 (36.32%) had elective CS. CS was performed in spinal anesthesia. Anesthesia was converted to general anesthesia from spinal anesthesia in six multiparous patients requiring hysterectomy due to uncontrollable bleeding. Low preoperative Hb, HCV/HBV status, placenta abruption, prolonged obstructed labor for LSCS, higher estimated blood loss and multiparous patients are common risks for blood transfusion, common indication for LSCS were fetal distress, repeat CS and hypertensive disorder. Also, 91.59% (2615) of the women did not receive either intraoperative or postoperative blood transfusion. The findings revealed that 8.4% (240) of women who had cesarean surgery received the blood transfusion as shown in table 2, among them 170 (70.8%) had emergency CS while 70 (29.2%) had elective CS.

Table 1: Blood Transfused in various age groups

Variable Age	All participants (n=2855)	No Blood (n=2615)	Received Blood(n=240)
<20	167 (5.85%)	131 (78.44%)	36 (21.56)
20-30	2325 (81.44%)	2185 (94%)	140 (6%)
31-40	354 (12.4%)	294 (83.05%)	60 (16.95%)
>40	9 (0.3%)	5 (55.55%)	4 (44.45%)

Table 2: Cesarean section type, Anesthetic technique, and Blood Transfusion status.

Variable	All participants (n=2855)	No Blood (n=2615)	Received Blood (n=240)
Preoperative Hb (n=2855)			
>10	1536 (53.80%)	1515 (98.6%)	21 (1.4%)
8-10	990 (34.67%)	907 (91.6%)	83 (8.4%)
<8	329 (11.52%)	193 (58.6%)	136 (41.1%)
CS type			
Primary	900 (31.52%)	837 (93%)	63 (8.6%)
Repeat (twice)	1370 (47.98%)	1257 (91.75%)	113 (8.25%)
More than Twice	585 (20.50%)	521 (89.05%)	64 (10.95%)
Ante partum Hemorrhage	80 (2.80%)		
No APH	2775 (97.2%)		

Table3: Cesarean types, mode of anesthesia and status of Blood Transfusion.

Variable	Frequency	Percentage
CS Type		
Elective CS	1037	36.32%
Emergency	1818	63.68%
Mode of Anesthesia		
Spinal Anesthesia	2700	94.44%
General	149	5.21%
Converted Spinal to GA	6	0.21%
Transfusion status		
No blood transfusion	2615	91.59%
Intra op. Transfusion only	80	2.8%
Post op transfusion	70	2.45%
Both intra op and post op	90	3.15%

Discussion:

In this study of 4823 who had deliveries, the blood transfusion rate was 8.1% for all deliveries, which is found similar as compare with 0.63% to 12.21% found in similar study done in Australia, the united states of America, Denmark and India,[6,8-10] indicating that in fact only few patients require the blood transfusion during cesarean section. The blood transfusion rate is not high as reported in other studies, in low resources areas and poor medical

availability areas. The blood arrangement for lower segment caesarean section is often a major issue for health care provider and is a major cause of delay for proposed emergency over elective surgeries, other cause of delay in one study is non-availability of anesthetist in underdeveloped countries averaged 12.5% and 25.2%[6]. The transfusion policy of hospital &transfusion practices of care providers may cause changes in the rate of blood transfusion. However, the predisposing factors suggests a similar trend of preoperative anemia, antepartum hemorrhage, positive hepatitis viral profile, multipara and blood loss at surgery remain major determinant factors for preoperative CS blood transfusion. It is important to note here that more patients required cesarean section (n=2855) in comparing to those patients who had normal vaginal delivery (n=1968). This observation of high rate of lower segment cesarean section, may be justify by the fact that our institution is a secondary health care facility where difficult and high-risk obstetric cases are usually referred.

Preoperative anemia being a major cause requiring transfusion in studies from underdeveloped and resource-poor countries[5,7,11.12] preoperative anemia may result from anemia in pregnancy and antepartum hemorrhage. The possible causes of anemia include nutritional deficiency, parasitic infestations, and hemoglobinopathies[13]. The health care provider team should make every effort to optimize the patients' hemoglobin before delivery. In this study a major predictor of transfusion is preoperative hemoglobin less than 8g/dl. This finding necessitates to increase awareness about antenatal visits, ensuring to check hemoglobin and treatment of common issue that may predispose the pregnant women to anemia. It has been found that status of HBsAg/HCV antibodies is also risk factor for anemia of pregnancy[11,12]. Other major cause of blood transfusion is blood loss during surgery. The blood loss due to the antepartum bleeding (abruption, placenta previa), pre-operative hemoglobin less than 8g/dl and loss of blood at least 1000ml increases the rate of blood transfusion. This finding is reported from other published studies as well[2,11.12]. At our institute indication for blood transfusion is higher for pregnant women presenting with anemia or preoperative bleeding; however, this may simply reflect the fact that these women presented sufficiently late to the hospital when transfusion becomes inevitable. The history of previous (repeat) cesarean section was not found to be significantly associated with blood transfusion at operative delivery in our study as reported by other study[12], the finding of current study is however supported by other studies[14,15] where no association is reported between repeat cesarean section and the risk of blood transfusion. The experience of the surgeon may play a significant role at determining the quantity of blood loss at surgery. When obstetrician experience and preoperative Hb were used to control purpose, the likelihood of blood transfusion was reduced. The blood transfusion during cesarean section may significantly affect morbidity and mortality, as shown in this study where 23.4% of patients who received blood transfusion because of severe hemorrhage. Further study using objective blood loss estimation techniques are required to provide accurate estimates of blood loss during cesarean delivery in our patient population. Six multiparous patients required cesarean hysterectomy because of severe uncontrolled hemorrhage and uterine atony. Uterine atony may predispose to postpartum hemorrhage.

Conclusion:

Preoperative hemoglobin of less than 8g/dl, antepartum hemorrhage, increasing parity, status of HBsAg/HCV positive were found to predict the need for blood transfusion. We would recommend that experienced surgeon should be readily available to attend to a pregnant patient with preoperative anemia and antepartum hemorrhage presenting for cesarean section.

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