RATIONALIZATION OF ROUTINE CROSSMATCHED BLOOD ARRANGEMENT FOR CAESAREAN DELIVERIES AND ANALYSIS OF RISK FACTORS REQUIRING BLOOD TRANSFUSION

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ABSTRACT

Objective: To assess the incidence of blood transfusions required in Caesarean section (CS) and evaluate the rationale of routinely arranging cross matched blood for every patient.

Study Design: A chart review retrospective descriptive study.

Place and Duration of Study: This study was conducted at the Anesthesia Department of Combined Military Hospital (CMH), Lahore, from June 2011 to May 2013.

Patients and Methods: In this retrospective study we reviewed all singleton CS performed using data from blood bank registry and all CS patient's charts obtained from the Records Department of the hospital. Clinical variables including demographic characteristics, estimated blood loss, indications for CS, preoperative haemoglobin and indications for transfusion were gathered. Patients transfused with blood had their medical records reviewed by two reviewers to confirm accuracy and identify risk factors for haemorrhage.

Results: A total of 6250 caesareans deliveries were performed over the study period. Out of these 381 patients were transfused (6.09%). Blood typing and screening was done for 3260 cases (52%) and blood was arranged for 2320 (37%). Among blood receiving patients 250 patients (65.62%) were emergencies. Ninety eight patients (25.72%) were primigravida. Indications for transfusion mentioned in the charts were preoperative anaemia (18.37%), repeat caesarean sections (39.37%), placenta previa (6.56%), severe preedampsia (17.06%), failed progress in labor and other rare causes (18.37%).

Conclusion: Transfusion risk in patients undergoing routine CS is low. Factors indicating risk for transfusion include preoperative anaemia, repeat caesareans, severe preedampsia, obstructed labor and placenta previa. In the absence of these risk factors routine arrangement of the blood does not enhance patient care.

Keywords: Blood transfusion, Caesarean section, Transfusion hazards.

INTRODUCTION

Caesarean section (CS) has been identified as one of the commonest indications for blood transfusion in obstetric practice. In normal pregnant females there is an increase of plasma volume by about 55%, producing dilutional anemia and reducing blood viscosity. At term blood volume is increased by 1000 to 1500 ml in most women, allowing them to easily tolerate blood loss associated with delivery. Average blood loss during vaginal delivery is 400-500 ml, compared with 800-1000 ml for a caesarean section. So if patient's preconditions are acceptable and surgical process remains smooth there is little risk of morbidity or mortality.

Objective data from the studies carried out internationally show a low incidence of need of blood transfusion during caesarean deliveries. However because of possible litigations and accountability fears, especially in private and military hospitals, majority of patients have blood typing and screening, in addition to one or two units of blood crossmatched for each. The safety of mother and baby and emotional state of the relatives, creates an added pressure over the involved anaesthetists and obstetricians. The heightened expectations in the general population of appropriate outcome and fear of litigation may have affected standing operating procedures resulting in injudicious transfusions. This creates major economical burden over poor families who are getting services as private patients. On the average screening and typing test costs 1500 Pak rupees and every unit of blood transfusion...
costs further Pak rupees 2000, this is many times more in some private hospitals. In addition blood transfusion still exposes the patients to many risks like, HIV infections, viral hepatitis and immunological reactions, a very high price to pay.6

But at the same time hemorrhage is among leading causes of direct maternal mortality in obstetric practice.7 It is major contributor to the maternal mortality in developing countries.8 Blood loss in caesarean section is not always anticipated. This usually happens in well documented high risk cases, like abnormal placental location and attachment to uterine wall (placenta previa, placenta accreta, and placenta increta), lesser experience and expertise of obstetricians, preeclampsia, HELPP syndrome, repeat caesarean sections, uterine anomalies and uterine or cervical tears. But blanket arrangement of crossmatched blood for every patient without known expected indications needs to be discouraged. Objective evidence is deficient from all levels of hospitals in our country. Judicious blood transfusion practices require to be vehemently implemented.10

The objective of our study was to assess the incidence of blood transfusions required in CS and evaluate the rationale of routinely arranging crossmatched blood for every patient.

PATIENTS AND METHODS

This descriptive study was conducted at the Anesthesia Department of Combined Military Hospital (CMH), Lahore, from June 2011 to May 2013. Inclusion criteria were all singleton emergency or elective CS. Patients who were transfused blood preoperatively were excluded from this study. Population for this study is families of military personnel and middle class civil population. Data pertaining to age, parity, booking status, indication for CS, blood loss at surgery, units of crossmatched blood reserved in the blood bank, and units of the blood transfused was extracted and analyzed.

In addition patients having systemic diseases not related to pregnancy were excluded from the study. Medical records of the patients were obtained from the hospital record department. In addition data from blood bank registry and obstetric data were collected from respective departments and were compared for accuracy. The data was recorded on a pre-designed proforma.

Decision of intra operative blood transfusion was made on clinical assessment of the patients.

Data analysis was carried out through SPSS version 17. Descriptive statistics were used to describe the results i.e mean and standard deviation (SD) for quantitative variables while frequency and percentages for qualitative variables.

RESULTS

A total of 6250 caesarean sections were performed over the research period of two years. The average age of patients was 28.30 (Range 17.50 to 41.80) year. Blood typing and screening was done for 3260 (52.16%) patients and blood was arranged for 2320 (37.12%) patients (fig-1). Only 381 patients required blood transfusions intra-operatively or postoperatively (average 1.7 units /patient) and hence the incidence of transfusion was barely 6.10%. Ninety eight (25.72%) Patients were primigavida out of the 381 patients who received blood transfusions. Moreover, 250 (65.62%) cases were treated as emergency, 70 patients (18.37%) had a haemoglobin level below 10 gm/dl, 150 patients (39.37%) had repeat caesareans, 61 (16.01%) patients among these were having Pregnancy Induced Hypertension (PIH) with pre eclampsia and 4 (1.5%) had fulminant eclampsia. Out of these 25 patients (6.56%) were diagnosed as having placenta previa of second degree or more severity. Among patients who received transfusions 55 (14.44%) belonged to negative blood groups.

DISCUSSION

The indications for CS, preoperative anaemia, and heavy blood loss during CS are important risk factors for blood transfusions.11 Severe haemorrhage requiring blood transfusion can be predicted in majority of patients on the basis of antenatal risk factors. In
our study incidence of blood transfusion is barely 6.1%. Incidence is quite variable in the international studies depending upon the health status of nations, available medical facilities, awareness in population, and institutional practices. A retrospective study of similar nature carried out in United States of America showed 3.3% incidence of blood transfusion in caesarean deliveries. However a study carried out in India depicted an incidence of blood transfusion 25.20%. A similar study carried out at Austria showed the incidence of blood transfusion in caesarean sections 0.63%.

In our study repeat CS, preoperative anaemia, severe PIH with preclampsia and failed progress in the labor were the main causes of blood transfusion. These results are comparable with international studies. Out of 381 patients who received blood 150 (39.37%) patients had previous history of CS. Women who delivered the first child by caesarean delivery have increased risk for malpresentations, placenta previa, ante partum haemorrhage, placenta accreta, prolonged labor and uterine rupture. Blood loss increases with increase in number of caesarean sections.

In the Subcontinent, anaemia is the commonest haematological disorder that may occur in pregnancy because of malnutrition and lack of balanced diet. In addition added stress of pregnancy further deteriorates the anaemic condition. According to WHO prevalence of anaemia in pregnancy in South East Asia is around 56%. Even a moderate blood loss in critically anaemic patients can threaten the life of patient. In our study out of 381 transfusions receiving patients 70 (18.37%) had their haemoglobin less than 10 gm/dl. Incidence of placenta previa is about 1% of hospital deliveries; this can result in serious hemorrhage. Among those who received blood sixty one (16.01%) patients were having PIH with preclampsia and four patients had fulminant edampsia. Among these patients were having platelets below accepted level contributing to blood transfusions along with platelet transfusions.

In our study 65.62% of patients who received blood transfusion were emergency cases following fetal distress or failed progress in labor due to malpresentation, cephalopelvic disproportions or uterine dystocia. Excessive haemorrhage in these cases was due to uterine atony, uterine rupture, and cervical or vaginal tears.

Although the incidence of severe transfusion reactions is now very low, in recent years it has become apparent that there is an immunological price to be paid for the transfusion of blood products which leads to increased incidence of morbidity and mortality. Moreover blood is a finite resource with a
limited shelf life and is associated with considerable processing cost. Therefore utilization of this resource needs critical review to identify areas of overuse and thus reduce the risk and hospital costs\(^5\). In our study blood was arranged for 37% patients and blood type and screen was done for 52% of the patients, where as only 6.1% patients required transfusion. This expresses irrational economical burden on hospital resources and paying patients\(^5\).

The risk of intra operative death for women who undergo caesarean section is very low (about 6 in 100,000) but heavy bleeding and Medelson syndrome are among the most common causes of death\(^7\). Efforts should be made to reduce blood transfusion without increasing maternal morbidity and mortality. However blood replacement should never be withheld whenever truly indicated. Patients with severe haemorrhage can enter a lethal downward spiral characterized by hypothermia, coagulopathy, and metabolic acidosis. To abort the cycle, replacement of the appropriate blood products and correction of physiological derangements is important\(^24\). The prediction of postpartum blood transfusion is difficult\(^25\). Anesthesiologists should always be vigilant, but not extravagant. Haphazard ordering of blood without evidence is simply not good practice.

**CONCLUSION**

In the absence of significant risk factors for haemorrhage in caesarean section in a tertiary care hospital setting, routine blood type, screen testing and arrangement of blood does not enhance patient care. These should be reserved only for high risk CS. Factors indicating risk for transfusion include preoperative anaemia, repeat caesareans, severe preeclampsia, obstructed labor and placenta previa. However blood transfusion should never be withheld when indicated. Clinical acumen and institutional guidelines have to be adhered to in this commonly performed surgery.

**CONFLICT OF INTEREST**

This study has no conflict of interest to declare by any author.

**REFERENCES**