



Original Research Article

Caesarean delivery-related blood transfusion: a prospective cross-sectional study

Article History:

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Abstract: Objective: To determine the frequency of blood transfusion in pregnant ladies delivered by Caesarean Section. Study Design: Cross sectional study. Place and Duration of Study: Department of Obstetrics and Gynaecology, Rai Foundation Teaching Hospital Sargodha. Duration of study was 6 months from February 2025 to July 2025. Methodology: The study was conducted by Obstetrics & Gynaecology department of Rai Foundation Teaching Hospital Sargodha from February 2025 to July 2025. Total of 254 pregnant ladies were included in this study who underwent Caesarean section after fulfilling inclusion and exclusion criteria and were identified by non-probability convenience sampling technique. They were enrolled to determine the frequency of blood transfusion during and within first 48 hours post-operative period. Results: In this study, out of 254 cases, 7.9% (n=20) were less than 20 years, 87.8% (n=223) were between 20 – 35 years and 4.3% (n=11) were more than 35 years, mean±sd was calculated as 28.34±5.77 years. Frequency of blood transfusion during and within 48 hours post-operative was recorded in 29.5% (n=75), out of them 22.4% (n=57) were transfused one unit of blood, 5.1% (n=13) were transfused two units of blood and 2% (n=5) were transfused more than 2 units of blood. Conclusion: We concluded that the frequency of blood transfusion during Caesarean section or within first 48 hours post-operative was 29.5%.

Keywords: Caesarean section, Blood Transfusion, blood Transfusion Reaction.

INTRODUCTION

Caesarean section rate is increasing day by day all over the world¹. According to WHO caesarean section rate has raised to 21% recently². However it is also causing increase in morbidity in the form of blood loss and prolonged hospital stay. It poses an additional cost burden on family and health insurance

program of country³. This blood loss is fulfilled by blood transfusion mostly by arranging or cross matching blood beforehand⁴. Sometimes surgery being delayed due to difficulties in arranging blood, inadequate blood banking services, rising cost⁵.

Under these circumstances it is important to deal with risk factors in antenatal period which are causative of blood transfusion. These risk factors include emergency caesarean section, unbooked status, anemia, previous surgery, scarred uterus, multiparity, level of expertise of surgeon, hypertension, eclampsia and comorbidities like HIV6. Most of these risk factors can be minimized by regular antenatal checkups and triaging the patients in high risk and low risk categories7. It would be prudent to get blood arranged for high risk patients rather than cross matching or arranging for every patient. In addition of being a lifesaving practice blood transfusion is associated with severe hazards like allergic reactions, viral infections, bacterial contaminations associated sepsis, transfusion related acute lung injury (TRALI) etc. 8. To reduce associated hazards early screening of blood products are necessary. Moreover, early correction of anemia during antenatal periods become mandatory 9. To reduce the need of blood transfusion it is required to evaluate the frequency of transfusion and its risk factors. In light of this risk factors can be dealt during antenatal period to minimize the need of transfusion at the time of delivery.

METHODOLOGY:

It was a cross-sectional study conducted at Department of Obstetrics and Gynaecology, Rai Foundation Teaching Hospital Sargodha, Pakistan from February 2024 to July 2024 after approval from Institutional Ethical Review Board. Sample was estimated as 254 cases using 95% confidence level, 5% margin of error within expected percentage of 21.1%. All patients undergoing elective as well as emergency sections were included, among total patients, transfusion required in LSCS are asserted. Questionnaire was filled. A comparison to be made among woman who went blood transfusion during LSCS and woman who didn't.

Inclusion criteria:

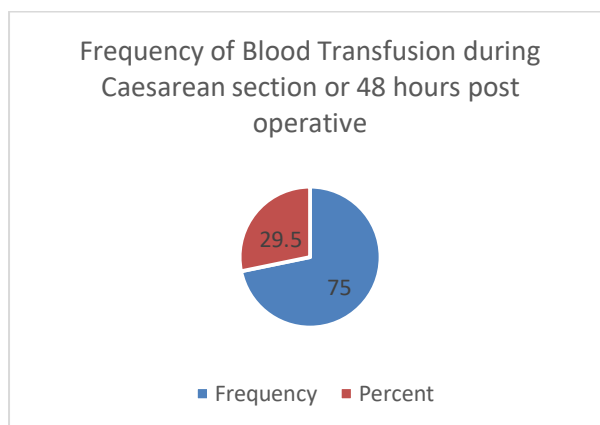
All other than exclusive C-section either emergency or elective is included.

Exclusion Criteria:

- Placenta Previa and all other APH are to be excluded.
- Co-existing uterine fibroids, Eclampsia indication of C-section are to be excluded regarding data collection

RESULTS:

This study included 254 patients who underwent cesarean delivery. The frequency of blood transfusion during Caesarean section or within first 48 hours post-operative was 29.5%. The majority of patients were between 20-35 years old (87.8%), booked (51.6%), and admitted through OPD (68.9%), multigravida (69.7%), and residents of urban areas (70.1%). Most patients had a gestational age of 37 weeks or more (68.9%) and did not have anemia (52.4%).



Blood Transfusion	Variable	Categories	Blood Trasnfusion (yes)	Blood Trasnfusion (No)	P value
	Age	<20 years 20-35 years >35yrs	5 (6.7%) 66 (88%) 4 (5.3%)	15(8.4%) 157(87.7%) 7(3.9%)	0.000
	Booking Status	Booked Unbooked	34 (45.3%) 41 (54.7%)	97(54.2%) 82(45.8%)	0.000
	Mode of Admission	OPD Emergency	54 (72%) 21 (28%)	121(69.1%) 58(73.4%)	0.000
	Parity	Primigravida Multigravida	17 (22.7%) 58 (77.3%)	60(33.5%) 119(66.5%)	0.854
	Place of	Rural	18 (24%)	58(32.4%)	0.926

	Residence	Urban	57 (76%)	121(67.6%)	
	Gestational Age	Preterm	29 (38.7%)	50(27.9%)	0.684
		Term	46 (63.1%)	129(72.1%)	
	Anemia	Mild	16 (21.3%)	29(16.2%)	0.000
		Moderate	36 (48%)	97(54.2%)	
		No Anemia	23 (30.7%)	53(29.6%)	

Table1: Frequencies of Blood Transfusion

We conducted paired samples tests to examine the differences between various variables and blood transfusion. The results showed that blood transfusion was significantly associated with the age group between 20 to 35 years with frequency of 66(88%) and p value 0.000. The results also showed that there was increased risk of blood transfusion in women who undergo caesarean section with moderate anemia with frequency of 36(48%) and p value 0.000. there was also strong association of blood transfusion with unbooked status, emergency admission, and multigravida with p value 0,000. It was also observed that increased frequency of blood transfusion in multigravida women but it was not statistically significant (P value 0.926). The frequency of blood transfusion in multigravida women was 58(77.3%) as compared to primigravida. There was no significant association between blood transfusion and address, or gestational age with p value 0.926, 0.684, 0.319 respectively

Overall, the findings suggested that certain demographic and clinical factors are associated with an increased likelihood of receiving blood transfusion during cesarean delivery. Understanding these relationships can inform clinical decision-making and resource allocation.

DISCUSSION:

There is a global increase in caesarean section rate. According to WHO consensus available from 2010-2018 caesarean rate is 21% worldwide. It has risen in all regions since 1990. Sub regions with the greatest increases were Eastern Asia, Western Asia and Northern Africa (44.9, 34.7 and 31.5 percentage point increase, respectively). By 2030 it will rise to 28.5% worldwide and rise in Eastern Asia would be 63.4%.¹⁰

Complications pertaining to caesarean delivery is also at rise. Increased blood loss and blood transfusion related complications are the prominent ones. In literature multiple risk factors for blood transfusion in caesarean delivery have been studied. In our study, anemia and multiparity in antenatal patients are two important outcome measures which if addressed adequately can reduce maternal morbidity and mortality in terms of transfusion related hazard.

In our study frequency of blood transfusion during caesarean section or within 48 hours post caesarean is 29%. It is even higher than those of Akinlusi et al conducted in South west Nigeria which showed 20%¹¹. In developed countries this rate is much lower as compared to our study e.g. in Australia 0.36% and in New York 3.5%^{12, 13}.

Most of the women who received blood transfusion in this study aged between 20 to 35 years and 76% of them were from urban origin which is consistent with a study from Finland¹⁴. The women from rural area are considered to be having difficulties approaching the health care facilities as being low resource income group and most of the studies indicate increased number of transfusions in rural population needed due to anemia like in a study conducted in Kentucky and

rural Appalachia^{15, 16}. A possible explanation of this difference in our study is that most of the rural population is being booked in our set up due to its location and undergo elective surgeries with most of the protocols being fulfilled to reduce maternal morbidity. In the present study 54% of the patients who had blood transfusion were unbooked and did not receive antenatal care. Lack of antenatal care is considered to be one of the strongest associated factor in blood transfusion at the time of delivery.^{17, 18}

Most of these patients were multigravidas 78% and had moderate anemia 48%. Multigravidas are at greater risk of having transfusion due to uterine atony, increased amount of blood loss and peripartum anemia¹⁹. In contrast to our study Shaikh AG et al showed vast majority of primigravidas 58.1% who received blood transfusion during caesarean section.⁸ Similarly anemia is considered to be an independent risk factor for receiving blood transfusion and our study is being supported by studies done by Xiaohaun Xu et al and Saifon et al^{20,21}. Another meta-analysis has shown prevalence of anemia in Sudan as 53% which is comparable to our study 48%.²² Women with any amount of anemia will tolerate less of blood loss at the time of caesarean section as compared to those with good stores of iron and haemoglobin.²³ Correction of anemia is the factor which can be dealt with in antenatal period by increasing awareness among public and guiding through importance of antenatal care.

In literature most of the studies have examined multiple risk factors associated with increase morbidity of mothers by intrapartum and post-partum blood transfusion but in our study only those factors are addressed which can be managed easily. It is also seen that by informing the patients as being

categorized in high risk group and increased chance of having post-partum hemorrhage and need of blood transfusion increase their compliance with iron intake during pregnancy and correction of anemia 24.

Limitation of study:

This study has been conducted in a single institution, data may be of regional significance. Larger sample size would have given more strength to the study. In addition multiple risk factors like antepartum and post-partum hemorrhage, BMI, time interval for caesarean section, surgical expertise and level of antenatal care can also be included in study. Such data will help in establishing regional guide lines to decrease maternal mortality in developing countries.

Conclusion:

We concluded that the frequency of blood transfusion during Caesarean section or within first 48 hours days post-operative was 29.5%. There was increased likelihood of blood transfusion during caesarean section was in multiparous and anemic women.

Conflict of interest: None

Authors' Contribution:

Following authors have made substantial contributions to the manuscript:

TF, AA, SS & NZ: Manuscript writing, data Collection, approval of the final version to be published.

MMH & AA: Critical review, approval of the final version to be published.

AA and TF: Critical review, data analysis, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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