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Original Article

Comparison of Maternal Bleeding During Preterm and Term Cesarean Delivery

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ABSTRACT

Objective: To compare maternal bleeding in pregnant women undergoing term and pre-term Cesarean delivery.
Study Design: Comparative cross-sectional study.
Place and Duration of Study: Gynecology and Obstetrics Department, Pak Emirates Military Hospital, Rawalpindi, Pakistan Jan to Jun 2021.
Methodology: A total of 211 pregnant women undergoing Caesarian section at our tertiary care center were included in the study. They were divided into two groups based on gestational age as term or pre-term, with delivery at 37 completed weeks being labelled full term. Lower segment cesarean section was carried out by consultant gynecologist on all the patients as per standard protocol and blood loss was compared in term and pre-term Caesarian deliveries.
Results: Out of 211 study participants, 108(51.1%) had a Caesarian section at term while 103(48.9%) had pre-term Caesarian section. The mean age of participants was 29.35±4.10 years. Mean blood loss during the Caesarian section in term pregnancies was 437.03±129.76 ml while in pre-term pregnancies was 641.26±157.40 ml. Independent t-test showed that bleeding was statistically significantly more in pre-term pregnancies (p-value<0.001). Post-operative hemoglobin was also significantly different in term and preterm pregnancies (p-vale<0.001).
Conclusion: Women undergoing Caesarian section pre-term were at risk of having more blood loss and fall in hemoglobin levels as compared to those undergoing Caesarian section at term.

Keywords: Caesarian, Gestation age. Hemorrhage, Pregnancy.

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INTRODUCTION

The physiology of women's bodies has been designed in such a way that it could accommodate the stress of pregnancy but still pregnancy and childbirth predispose the women's body to various challenges.[1] These challenges may increase if the physiological process of labor could not occur and women had to undergo a Caesarian section for delivery of the baby.[2] Multiple maternal and fetal complications have been linked with delivery via the lower segment Caesarian section.[3] Bleeding during or after the labor is part of the normal process but it exceeds a certain limit can be hazardous and lead to serious consequences.[4] Delivery of newborn via lower segment Caesarian section (LSCS) usually accompanies more blood loss as compared to delivery via a spontaneous vaginal method.[5] Multiple maternal, fetal, and procedural factors affect the amount of blood loss during delivery via Caesarian section.[6]

Both Caesarian section delivery and preterm delivery have been associated with several untoward outcomes including increased bleeding during or after the delivery.[7,8] A population-based study revealed similar findings and patients undergoing preterm delivery had more chances of having complications of the Caesarian section including increased bleeding during and after the procedure.[9]

Most of the deliveries in Pakistan occur as unbooked cases with limited antenatal care. Maternal mortality is grossly affected by the amount of bleeding that occurs during normal vaginal or Caesarian delivery and clinicians make all the effort to minimize the blood loss. Statistics show that the incidence of deliveries via Caesarian section is on a rise in Pakistan.[10] Limited local data is available on the subject. We, therefore, planned this study with the rationale to compare maternal bleeding in pregnant women undergoing term and pre-term Caesarian delivery at our t hospital.

METHODOLOGY

The comparative cross-sectional study was conducted at Gynecology and Obstetrics Department Pak Emirates Military Hospital, Rawalpindi Pakistan from January 2021 to June 2021 after approval was obtained from the Internal Review Board of (IREB Letter no: A/28/33/EC/187/2020). WHO Sample size calculator was used for sample size calculation,

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with population prevalence of bleeding in pre-term deliveries during Caesarian section as 9.7%.[11] Nonprobability consecutive sampling technique was used to gather the sample for this study.

Inclusion Criteria: Pregnant women aged 20-35 years undergoing Caesarian sections were included.

Exclusion criteria: The diagnosed cases of placenta previa and placental abruption, patients undergoing emergency Caesarian sections in active labor and those who were known cases of any bleeding or clotting disorders or suffering from any hematological malignancies or those who had used Aspirin or other blood thinners due to any indication were excluded.

The study was explained and informed consent was taken. The lower segment Caesarian section was performed by a consultant gynecologist as per routine protocol.[12] The blood loss was measured following placental delivery till the end of the surgery by gravimetric method.[13] Blood collected in the suction container was noted. Soaked mops and operation table perineal sheets were weighed by electronic scale before and after the surgery. The total amount of blood loss (ml) was determined as the sum of: 1) Blood absorbed by soaked mops {wet weight of used mop–dry weight} +;2) Blood absorbed by a perineal sheet during vaginal toileting {wet weight–dry weight} +;3) Blood collected in a suction container. Amniotic fluid and the volume of blood loss before placental delivery were not included in the study. Pre-term delivery was defined as delivery occurring at the gestational age of less than full 37 weeks.[14]

Statistical analysis was performed by using Statistics Package for Social Sciences version 24.0 (SPSS-24.0). Mean and standard deviation was calculated for age of patients, blood loss in both groups, and pre and post-operative hemoglobin levels. Frequency and percentages for patients undergoing Caesarian section at term and pre-term were calculated. Independent samples t-test was applied to look for the difference in blood loss in both the groups and pre and post-operative hemoglobin levels. The *p*-value of less than or equal to 0.05 were considered significant.

RESULTS

Out of 211 study participants, 108(51.1%) had a Caesarian section at term while 103(48.9%) had pre-term Caesarian section. The mean age of participants was 29.35±4.10 years. Table-I showed the baseline characteristics of study participants. Mean blood loss during the Caesarian section in term pregnancies was 437.03±129.76 ml while in pre-term pregnancies was 641.26±157.403ml. Mean pre-operative hemoglobin in term pregnancies was 11.2009±0.775 mg/dl while in pre-term pregnancies was 11.010±0.677mg/dl. Mean postoperative hemoglobin in term pregnancies was 9.804±0.707 mg/dl while in pre-term pregnancies was 8.876±0.991 mg/dl. It was revealed that (Table-II) blood loss was statistically significantly more in preterm pregnancies (*p*-value<0.001) as compared to term pregnancies undergoing Caesarian section. Table-III showed that there was a significant change in hemoglobin levels. Post-operative hemoglobin level was statistically significantly different in term and preterm pregnancies (*p*-vale<0.001) undergoing Caesarian section. There was no statistically significant difference in hemoglobin of both groups before the surgery (*p*-value-0.060).

Table-I: Characteristics of the Pregnant Women Included in the Study (n=211)

Parameters	n(%)
Age (years)	
Mean+SD	29.3555±4.102 years
Delivery at Term	
No	103(48.8%)
Yes	108(51.2%)
Pre-operative Hemoglobin	
Term	11.2009±0.775 mg/dl
Pre-term	11.010±0.677 mg/dl
Post-operative Hemoglobin	
Term	9.804±0.707 mg/dl
Pre-term	8.876±0.991 mg/dl
Blood loss	
Term	437.037±129.76 ml
Pre-term	641.262±157.403ml

Table-II: Difference in blood loss in term and preterm Caesarian section (n=211)

Parameters	Study Groups		*p*-value
	Term (n=108)	Pre-term (n=103)	
Blood loos in milliliters (Mean±SD)	437.037±129.76	641.262±157.403	<0.001

Table-III: Difference in Pre and Post-operative Hemoglobin (n=211)

Parameters	Study Groups		*p*-value
	Term (n=108)	Pre-term (n=103)	
Pre-operative hemoglobin in mg/dl (Mean±SD)	11.2009±0.775	11.010±0.677	<0.060
Post-operative hemoglobin in mg/dl (Mean±SD)	9.804±0.707	8.876±0.991	<0.001

DISCUSSION

We found that women undergoing Caesarian section at pre-term were at risk of having more blood loss and fall in hemoglobin levels as compared to those undergoing Caesarian section at term.

Sirgant *et al*.[15] in their study published in 2020 to evaluate whether gestational age was associated with the severe maternal morbidity of preterm cesarean delivery between 22 and 34 weeks of gestation came up with the findings that excessive bleeding was a common finding among preterm deliveries with Caesarian section. Our results supported the findings of the aforementioned study. Suzuki *et al*.[16] published an interesting study from Japan with a different design. They tried to look or risk factors associated with increasing post-partum bleeding in twin and singleton pregnancies. They found out that gestational age and hypertensive disorders were risk factors associated with increased blood loss in addition to placental abnormalities. We did not include patients with placental abnormalities and twin pregnancies but still found out that gestational age at the time of delivery is a risk factor for increased bleeding in women undergoing Caesarian sections.

A similar study was performed by Reddy.[17] in 2015 to look for the prevalence of serious maternal complications including excessive bleeding following early preterm birth by gestational age, delivery route, and type of Cesarian incision. They revealed that complications including excessive bleeding were found more in patients undergoing a Caesarian section and pre-term deliveries as compared to those having vaginal deliveries at term. These are in concurrence with the findings of our study. Kawakita *et al*.[18] in 2016 published a study regarding maternal outcomes associated with early preterm cesarean delivery. They found out that bleeding requiring transfusion was associated with Caesarian section, which is in line with our findings.

Certain limitations make the results of this study less generalizable. The patients were not followed up for long-term complications. The method used for estimation of the amount of blood loss was also crude. Based on our results, researchers can plan larger studies with more sophisticated designs to generate generalizable results for the local population in this regard.

CONCLUSION

Women undergoing Caesarian section at preterm were at risk of having more blood loss and fall in hemoglobin levels as compared to those undergoing Caesarian section at term.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SI & RM: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

SK & MK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

NH: Conception, data acquisition, 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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