

# Need for Blood Transfusion Following Caesarean Section, Elective Verses Emergency

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## ABSTRACT:

**INTRODUCTION:** Caesarean section is one of the most common operations performed worldwide in obstetrics. In comparison to vaginal delivery, the need for blood transfusion has increased significantly with caesarean delivery.

**METHOD:** A retrospective study was carried out at Patan hospital Lalitpur Nepal, from first January 2015 to 28th of February 2015, which included women of caesarean section. Data was obtained on age, parity, gestational age, hematocrit levels, caesarean type and indication. Patients who required blood transfusion were also noted for data analysis.

**RESULT:** A total of 451 patients underwent caesarean section out of 22(4.8%) patients received blood transfusion either during or after surgery.

**CONCLUSION:** Only Grouping With Confirmation Of Availability Should Be Done For Emergency Situation.

**KEY WORDS:** Blood loss, blood transfusion, caesarean section.

## INTRODUCTION

Hemorrhage has been identified as the single most important cause of maternal death worldwide, accounting for almost half of all postpartum deaths in developing countries. Despite the advances in the management hemorrhage, blood loss during delivery is still a major concern for all the obstetricians. Prompt provision of blood and blood products can often be lifesaving and also prevent maternal morbidity.

Caesarean delivery comparatively carries more of mater morbidity than vaginal delivery mainly due to hemorrhage, puerperal infection and thromboembolism. The procedure has been identified as a common indication for blood transfusion in obstetric practice because it involves risk of major intra-operative blood loss.<sup>2</sup> The increased blood volume during pregnancy is associated with nature's preparedness to accommodate the obligatory blood loss that occurs during vaginal or caesarean delivery.<sup>3</sup>

However, blood loss may overwhelm compensatory mechanisms and result in shock with adverse outcome in both mother and foetus.<sup>4</sup>

In our center, anesthetists routinely request for a minimum of two units of cross-matched blood for caesarean section cases irrespective of the pre-operative hematocrit.

## METHOD

This was a retrospective study carried out at Patan Hospital Lalitpur, Patan Academy of Health Sciences (PAHS) Nepal, where 451 pregnant women underwent caesarean section in two months (first January 2015 to 28 February, 2015) were included for the study. The institutional review committee Patan Academy of Health Sciences (IRC-PAHS) approved the study protocol. Written informed consent was taken the women participated in the study. Gestational age was calculated from last menstrual period (LMP) and confirmed by first trimester ultrasonography. Surgery was performed according to standard protocol. Placenta was delivered by controlled cord traction except where this was difficult and manual removal was performed.

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Data were obtained on age, parity, gestational age, caesarean type (elective/ emergency) and indication for caesarean section, pre-operative and post-operative hematocrit levels. Number of patients who required blood transfusion was noted. Routine hematocrit measurement and blood type sampling were performed on the morning prior to surgery in elective cases and during emergency, hematocrit measurement was carried out prior to the surgery and hematocrit measurement was repeated 24 hours after surgery. All the patients underwent caesarean section under spinal anesthesia except for two with placenta praevia. All the patients received ten units of oxytocin intramuscular and ten units of oxitocin in 500 ml of normal saline intra-operatively after delivery of the baby. Patients were treated post-operatively with three liters of isotonic solution for 24 hours. Except in postpartum haemorrhage, utero-tonic drugs like ergometrine and prostaglandins were not used routinely.

The data were analyzed using SPSS version 16.0 software. Difference between pre-operative and post-operative hematocrit levels taken 24 hours apart were observed and analyzed.

## RESULT

The total deliveries were 1203 out of which caesarean section were 451 (37.4%) during the study period among which 415 (92%) were term and 36 (8%) preterm; 254 (56%) were primi-gravida and 197(43.6%) multigravida. Blood was arranged in all cases but only 22 (4.8%) received blood transfusion, one (0.2%) intraoperative transfusion for abruptio placentae and

21 (4.6%) patients post-operative transfusion. Though total cross-matched blood was 902 units only 50 units (5.54%) were transfused. Three (0.6%) received ergometrine and carboprost prior to blood transfusion.

Regarding level of surgeons, 259 (54.4%) cases were performed by obstetrician and 192 (42.5%) were performed by residents. Among the 22 patients who received blood transfusion, 16 (72.7%) were performed by lecturer and seniors and six (27.2%) were performed by residents. This shows that, seniors who had performed surgeries needed more transfusions than juniors because more high-risk cases were done by seniors.

In antenatal supervision, 62.97 percent had booked at Patan Hospital among which only 2.44 percent underwent blood transfusion and in 35.25 percent booked outside Patan Hospital only 2.21 percent underwent blood transfusion both of which were not statistically not significant. Even among the unbooked 1.78 percent, 0.22 percent needed blood transfusion, which was also not statistically significant. Thus, there was no significant association of the requirement of the blood transfusion and the booking status (Table 1).

Emergency caesarean section was performed on 75.38 percent among which 3.54 percent underwent blood transfusion while in 24.61 percent of elective caesarean section, 1.33 percent underwent blood transfusion. This was not statistically significant. Similarly, while taking into consideration the primary and repeat caesarean section, 3.54 percent and 1.33 percent required blood transfusion respectively. This was also statistically not significant (Table 1).

**Table 1: Characteristics of patients that had caesarian section and blood use.**

Parameters	Total C/S	No. transfused	Units	P
Booking status				
Booked PH*	284(63%)	11(4%)	24(48%)	0.196(chi-square test)
Booked Outside	159(35.2%)	10(6.2%)	24(48%)	0.305(chi-square test)
Unbooked	8(2%)	1(12.5%)	2(4%)	0.331(Fishers exact test)
Caesarean Section				
Elective	111(25%)	6(5.4%)	14(28%)	0.760(chi-square test)
Emergency	340(75.3%)	16(5%)	36(72%)	
Primary C/S #	372(82.4%)	16(4.3%)	36(72%)	
Repeat C/S #	79(17.5%)	6(7.5%)	14(28%)	
Total	451	22	50	

\* Patan hospital

# Caesarean Section

Fetal distress, cephalopelvic disproportion and failed induction were the major indications of caesarean section among which previous scar and fetal distress required more of blood transfusion (Table 2).

Indication	CPD*	Pre-vious Scar	Fetal dis-tress	Placenta previa	Breech	Pre-ec-lampsia/ eclampsia	Failed Induc-tion	Multiple preg-nancy	Mal presen-tation	Abrup-tio pla-centa	NPOL ☆	PROM with Pre-vious C/S ▲	Others	Total
Frequency	98	24	133	5	37	12	66	6	8	1	23	1	34	451
No. trans-fused	3	6	5	1	-	1	1	-	-	1	1	1	1	21
Units received	6 (12%)	14 (28%)	12 (24%)	2 (4%)	-	2 (4%)	2 (4%)	-	-	2 (4%)	2 (4%)	4 (8%)	4 (8%)	50
Fishers Test p-value	1	0	0.633	0.222	-	0.999	0.225	-	-	0.048	1	0.048	0.718	-

\*Cephalopelvic disproportion ☆ Non progress of labour ▲Prelabour rupture of membrane

Parameter	No Transfusion Group (n=429)	Transfusion Group (n=22)	p-value
Pre-op HCT* (Mean ±SD#)	35.73 ± 3.025	31.63±5.305	<0.000
Post-op HCT (Mean± SD)	32.11±3.502	29.00±3.741	0.00005

\* haematocrit # Standard deviation

## DISCUSSION

The ability of pregnant women to withstand blood loss at the time of delivery depends on the haemoglobin level, the blood volume, the volume of blood loss, any associated co-existing disease and complications.<sup>5,6</sup> Accurate estimation of blood loss at the time of caesarean section delivery is important in transfusion practice. It is difficult to estimate the blood loss accurately in this surgery because of dispersion of blood loss and secondly due to blood being mixed with amniotic fluid. The blood volume of a pregnant woman with a normal pregnancy induced hypervolemia usually increases by 30 to 60%, which amounts to 1500 to 2000 ml for an average sized woman.<sup>7</sup>

The present study showed mean drop of hematocrit among caesarean delivery to be 2.4 percent but Combs et al<sup>8</sup> showed a mean drop in haematocrit of 4.2 percent.

The increasing use of surgery for childbirth and subsequent need for blood transfusion together with patient's reluctance to receive homologous

transfusion poses a challenge to the obstetricians and anaesthetists.<sup>9</sup> Although, improvement in obstetrics surgical techniques and practice may have decreased the use of homologous blood transfusion at the time of caesarean section.<sup>10</sup> Certain trends or consideration have contributed to decreasing transfusion rate. These include physician's acceptance of lower peri-operative haemoglobin concentration or haematocrit levels, reduced patient's willingness to accept the risk of transmission of blood borne infectious agents, more restrictive indications for blood transfusion and the fact that the obstetrics population is largely young and healthy.<sup>11</sup>

The caesarean section rate in this study was 37.4% which is very high compared to 10-15% in the United States<sup>12</sup> and 5-21.8% reported in Sub-saharan Africa.<sup>13</sup> The World Health Organization suggested a caesarian section rate of 5-15% in any facility.<sup>14</sup>

The transfusion rate among caesarean delivery was 4.8% which is consistent with transfusion rate of 1-14% as observed by review of literature.<sup>15,16</sup>

Considering the demographic characteristic of patients who had blood transfusion and those who did not, the age, parity and booking status were not significantly associated with increased risk of blood transfusion. This is contrary to the findings of Imarengiaye et al<sup>18</sup> who reported a six fold risk of blood transfusion in unbooked cases and might be a reflection of some degree of antenatal care even in the 'unbooked' patients in a cosmopolitan setting as ours. This finding is lower with the report by Tolby and Scott<sup>19</sup> who found a statistically significant risk of transfusion in their subjects undergoing emergency caesarean section.

In primary caesarean section, 4.3% received blood transfusion compared to 7.5% repeat caesarean section. Total units of transfusion was also more in repeat section. In this study, fetal distress followed by cephalo-pelvic disproportion were found to be the most common indications for emergency caesarian section in most series.<sup>17, 20</sup>

Among the patients who underwent blood transfusion the preoperative hematocrit was  $31.63 \pm 5.305$  (mean  $\pm$  SD) and those who did not undergo transfusion was  $35.73 \pm 3.025$  which was statistically significant (p value  $< 0.000$ ). And the postoperative hematocrit among transfusion and non-transfusion was  $29.00 \pm 3.741$  (mean  $\pm$  SD) and  $32.11 \pm 3.502$  which was statistically significant (p-value 0.00005) (Table 3).

## CONCLUSION

This study revealed that most patients that had to undergo caesarean section did not require blood transfusion at all despite the arrangement of huge number of units of blood. This resulted in wastage of financial, laboratory and blood bank resources. In developing countries where availability of blood and blood products are scarce, a convenient provision of mini-blood bank within the obstetric department itself along with careful and meticulous patient categorization may ensure prompt availability of blood for surgery as and when needed without the hassle of being tied down to the stock in the central blood bank.

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