

Calculated Allowable Blood Loss and Transfusion Among Women with Postpartum Hemorrhage During Cesarean Delivery: A Retrospective Cohort Study

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Background

- In order to account for the anticipated major blood loss during delivery, pregnancy results in an increase in blood volume
- In the non-pregnant population, ABL is used to predict need for transfusion in the setting of anticipated blood loss or hemorrhage
- This study aimed to apply existing ABL equations and to evaluate if estimated blood loss exceeding ABL correlates with need for transfusion in obstetric hemorrhage

Methods

- Retrospective study from January 2016 to January 2018
- Inclusion: Cesarean delivery with postpartum hemorrhage (EBL > 1000mL)
- ABL calculated using estimated blood volumes at term (EBV_{TERM}) and adjusted for gestational age (EBV_{EGA})
 - EBV_{TERM} : 94mL/kg
 - EBV_{EGA} : 84 ml/kg for 24-27 weeks, 92mL/kg for 28-34 weeks, 96mL/kg for 35-41week
- ABL calculated using a hemoglobin transfusion threshold of 7.0 g/dl
- Difference between ABL and EBL calculated for both ABL_{TERM} and ABL_{EGA}

$$ABL = EBV \times \left[\frac{Hb_i - Hb_f}{Hb_i} \right]$$

*ABL=Allowable Blood Loss, EBV=Estimated Blood Volume, H_i =Initial Hemoglobin, H_f =Final Hemoglobin

Results

- 401 met inclusion criteria
- 53 (13%) required blood transfusion
- Sensitivity of EBL exceeding ABL_{term} was 58%
- PPV of EBL exceeding ABL_{term} was 97%
- Sensitivity of EBL exceeding ABL_{EGA} was 55%
- PPV of EBL exceeding ABL_{EGA} was 97%

	Transfusion (n=53)	No Transfusion (n=348)	P
ABL_{term}	2686 (1993-3228)	3211 (2767-3755)	<0.0001
ABL_{EGA}	2743 (2035-3279)	3243 (2823-3808)	<0.0001
$ABL_{term} - EBL$	-241 (-1162 – 918)	1863 (1278-2452)	<0.0001
$ABL_{EGA} - EBL$	-195 (-1189 – 1131)	1907 (1296-2479)	<0.0001

*Data presented as median (interquartile range)

Both ABL_{term} and ABL_{EGA} were associated with low sensitivity but high positive predictive value for transfusion

Discussion

- With the introduction of obstetric hemorrhage toolkits, we have made improvements on identifying individuals who are at risk for PPH, however, predicting which patients will require transfusion remains challenging
- ABL may be a useful tool in considering resource allocation during PPH particularly in women with low ABL, such as patients with low weight and severe anemia
- Future studies should validate ABL prospectively as a predictor for pre-transfusion testing and evaluate ABL in the context of QBL

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2. Aguree S. BMC Pregnancy Childbirth. 2019;19(1):508.