

Does Quantitative Blood Loss have greater clinical utility than Estimated Blood Loss in High Risk Populations?

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Background: Postpartum hemorrhage is defined as blood loss greater than 1000mL or blood loss that causes vital sign changes indicative of hypovolemia in the first 24 hours after delivery, regardless of delivery type. Hemorrhage is the number one cause of maternal mortality worldwide and the number one cause of maternal morbidity in the United States. Traditionally, blood loss was estimated by the provider on sight, designated Estimated Blood Loss or EBL. This method is subject to operator error and accuracy does not improve with clinical experience. More recently, efforts have been made to quantify blood loss by weight, designated Quantitative Blood Loss or QBL. While QBL has been shown to be more accurate than EBL at identifying women with postpartum hemorrhage, most studies have not found QBL to be superior to EBL at predicting hemoglobin decrease or which women will receive a blood transfusion. Given these conflicting results on clinical utility, there is not consensus regarding whether the time and resources required for QBL are justified by the outcomes.

Purpose: This study investigated whether the technique of EBL or QBL is more accurate at predicting clinically significant blood loss associated with childbirth, and whether predictive ability differs across demographic groups. This study specifically addresses blood loss in the high risk groups of those with obesity and pre existing anemia. It is the first to examine whether the best method of recording delivery blood loss may differ according to a patient's individual risk of clinically significant blood loss.

Methods: A retrospective chart review of patients delivering at Kennestone Hospital before and after implementation of the QBL system. For each delivery we examined demographic characteristics, BMI, the presence of pre-existing anemia, change in hemoglobin post delivery, and whether clinical interventions due to blood loss were employed. We compared the correlation between recorded blood loss and hemoglobin change, and need for interventions for deliveries using EBL and QBL, as well as within the subgroups of those with anemia and those with BMI greater than 30.

Results: Our analysis included 501 deliveries, split evenly between the qualitative blood loss and estimated blood loss groups. In each group approximately two thirds of the deliveries were vaginal and one third Cesarean. Quantitative blood loss was significantly higher than estimated blood loss for vaginal deliveries ($p < .01$). Blood loss at Cesarean delivery was not significantly different between the QBL and EBL groups. Recorded blood loss was not significantly different when comparing race or those with obesity to those without obesity. Quantitative blood loss and estimated blood loss were equally predictive of decrease in hemoglobin. Within the subgroup of those with pre existing anemia, QBL predicted hemoglobin decrease but EBL did not. Quantitative blood loss over 500mL was a predictor of both vital sign changes indicative of hypovolemia (OR 2.93, CL [1.69, 5.09]) and initiation of interventions. Estimated blood loss greater than 500mL was not predictive of vital sign changes or need to intervene.

Conclusions: More accurate identification of significant blood loss to prompt quicker intervention is one means of lower morbidity associated with postpartum hemorrhage. This study demonstrated that QBL outperforms EBL at predicting clinically significant blood loss requiring intervention at blood loss volumes greater than 500mL and when there is pre existing anemia. This study supports the use of QBL instead of EBL. More importantly, it may be prudent when employing QBL to use 500mL as a trigger to consider initiation of interventions such as uterotonics, IVF resuscitation or transfusion.

Disclosure: This research was previously presented at the WellStar Annual Resident Research Day for GME faculty and current residents within the WellStar system only.