

Assessing the accuracy of calculating the accuracy of the calculation of intraoperative blood loss during elective lower segment cesarean sections using changes in preoperative and postoperative hematocrit (HCT).																																			
Background - Following childbirth, women's vital signs deteriorate after losing 25 percent (1500 ml) of their total blood volume. - Accurate and prompt calculation of intraoperative blood loss after delivery is essential to prevent excessive blood loss and its complications. - Among blood loss calculation methods, gravimetric blood loss measurement (gBL), visual blood loss estimation by a blinded obstetrician (oBL) and anesthesiologist (aBL), and the most recent technique the Triton System (tBL) are commonly used and as of yet, no method has been determined to be the most accurate. - KHUH follows gravimetric blood loss measurement (gBL). - The study examines the accuracy of gravimetric (gBL) methods in estimating intraoperative blood loss following a repeat cesarean section to improve patient care by identifying PPH earlier, thus reducing morbidity and mortality.	Table: Blood loss observed and calculated <table> <tr> <th></th><th>Mean ± SD</th><th>Range</th></tr> <tr> <td>Age (Mean ± SD)</td><td>32.18 ± 4.93</td><td>19 - 44</td></tr> <tr> <td>BMI (Mean ± SD)</td><td>31.98 ± 6.67</td><td>16 - 52.7</td></tr> <tr> <td>Pre-op hematocrit (Mean ± SD)</td><td>34.39 ± 3.54</td><td>11.2 - 41.50</td></tr> <tr> <td>Post-op hematocrit (Mean ± SD)</td><td>33.01 ± 3.48</td><td>24.5 - 41.2</td></tr> <tr> <td>Blood loss calculated (missing info n=17) (Median, IQR)</td><td>231.6 (IQR: -14.85- 486.05)</td><td>-8178.0 - 2037.4</td></tr> <tr> <td>Intraoperative volume loss (Median, IQR)</td><td>400.0 (IQR: 350-500)</td><td>250.0 - 900.0</td></tr> <tr> <td></td><td>424.36 ± 119.1</td><td></td></tr> </table> Bivariate analysis: A weak positive significant correlation is observed between calculated and observed blood loss. <table> <tr> <td>Calculated Blood loss</td><td>Pearson Correlation</td><td>Observed blood loss</td></tr> <tr> <td></td><td></td><td>.176*</td></tr> <tr> <td></td><td>Sig. (2-tailed)</td><td>.012</td></tr> </table>		Mean ± SD	Range	Age (Mean ± SD)	32.18 ± 4.93	19 - 44	BMI (Mean ± SD)	31.98 ± 6.67	16 - 52.7	Pre-op hematocrit (Mean ± SD)	34.39 ± 3.54	11.2 - 41.50	Post-op hematocrit (Mean ± SD)	33.01 ± 3.48	24.5 - 41.2	Blood loss calculated (missing info n=17) (Median, IQR)	231.6 (IQR: -14.85- 486.05)	-8178.0 - 2037.4	Intraoperative volume loss (Median, IQR)	400.0 (IQR: 350-500)	250.0 - 900.0		424.36 ± 119.1		Calculated Blood loss	Pearson Correlation	Observed blood loss			.176*		Sig. (2-tailed)	.012	Results - A total of 205 (25 % of total CS) repeat cesarean sections were included. - The mean age of the population was 32.46±4.93 years and the mean BMI was 31.42±6.85. - Most of them, 182 (88.8%) had intraoperative blood loss of fewer than 500 ml with a median of 400 ml. - The mean preoperative (on admission) and postoperative (before discharge) hematocrit were respectively 34.37% and 33.05%, and the median of calculated blood loss based on patients' blood volume and drop in hematocrit was 245 ml. - A weak positive but significant correlation was seen between calculated and observed blood loss (r = 0.171, p=0.000). - The limits of agreement were found to be -1001.8 and 616.77, indicating that 95% of the differences between these two measurements were within this range. - Intraoperative blood was underestimated for 55 (26.8%) patients and was overestimated for 111 patients (54.1%) (n= 40 missing data as some women declined to check blood tests two times).
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Methodology - This prospective study retrieved information from repeat cesarean sections at King Hamad University Hospital in 2021. - Intraoperative blood loss was calculated using the gravitational blood loss (gBL) method, which involves adding the amount of blood in the suction container collected after delivery of the placenta and the weight of blood-soaked sponges. - Two complete blood counts were done; the first sample was done after admission, before surgeries, and the second one after surgery to calculate the heamtocrit drop. - Blood loss volume was determined by using the formula based on total blood volume in the body and haematocrit drop. - Bivariate analysis was done to find the correlation between intraoperative observed blood loss and calculated blood loss. - The limit of agreement between observed and calculated blood loss was determined by Bland-Altman plot.		blood volume calculation formula The blood volume calculation formula mentioned in Williams Manual Obstetrics was used in order to calculate the estimated blood loss. The formula is - Calculated pregnancy blood volume = (0.75 ([maternal height (inches) X 50]+ [maternal weight in pounds X 25]) - Percent of blood volume lost = (Predelivery HCT- postdelivery HCT) / predelivery HCT. - Calculated estimated blood loss (cEBL) = Calculated pregnancy blood volume X Percent of blood volume lost																																	
	Fig: Bland-Altman Plot:A good level of agreement between the calculated blood loss and observed blood loss is seen with a few outliers	Conclusion - The gravimetric method of blood loss estimation was found to be reliable and could be used with confidence to measure intraoperative blood loss in daily clinical practice. - However, in low volume of blood loss, it overestimates blood loss.																																	