

ความแม่นยำในการคาดคะเนปริมาณการเสียเลือด ในการคลอดทางช่องคลอดด้วยตาเปล่า ในโรงพยาบาลกระบี่

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Abstract : Accuracy of Blood Loss Estimation in Vaginal Birth Using Visual Estimation Method at Krabi Hospital

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Objective: To study the accuracy of blood loss estimation following vaginal birth conducted by physicians and nurses using visual method comparing to gravimetric method at Krabi Hospital. **Methods:** The study was conducted in 100 patients who gave vaginal birth at Krabi Hospital during December 1st, 2015 – January 31st, 2016. The accuracy of the blood loss estimation using visual estimation method and gravimetric method were compared. **Result:** The blood loss estimation using visual method is significantly different from the estimation using gravimetric method. Under visual estimation, physicians and nurses produced 26.7% and 40.6% less accurate estimation accordingly. Among the participants, 14 patients with over 500 milliliter bleeding were found under-estimated by 50.2% from physicians and 59.9% from nurses using visual method. **Conclusion:** The blood loss estimation of vaginal birth using visual method by physicians and nurses is not accurate especially in the patients with massive hemorrhage.

Keyword : Visual blood loss estimation, Postpartum blood loss

บทคัดย่อ

วัตถุประสงค์ : เพื่อศึกษาความแม่นยำของการคาดคะเนการเสียเลือดหลังคลอดด้วยตาเปล่าของแพทย์และพยาบาล เปรียบเทียบกับการคาดคะเนด้วยวิธีการใช้ถุงตวงเลือดชนิดมีเส้นขีดบอกปริมาณในโรงพยาบาลกระบี่ **วิธีการ :** เป็นการศึกษาในผู้ป่วยที่มาคลอดทางช่องคลอดที่โรงพยาบาลกระบี่ 100 ราย ระหว่างวันที่ 1 ธันวาคม พ.ศ. 2558 ถึง 31 มกราคม พ.ศ.2559 โดยเปรียบเทียบการคาดคะเนการเสียเลือดด้วยตาเปล่าและวิธีการใช้ถุงตวงเลือดชนิดมีเส้นขีดบอกปริมาณ **ผล :** การคาดคะเนการเสียเลือดด้วย

ตาเปล่ามีความแตกต่างจากการคาดคะเนด้วยการใช้ถุงตวงเลือดอย่างมีนัยสำคัญ โดยแพทย์และพยาบาลมีการคาดคะเนต่ำกว่าวิธีการใช้ถุงตวงเลือด ร้อยละ 26.7 และร้อยละ 40.6 ตามลำดับ พบว่ามีผู้ป่วย 14 รายที่มีการคาดคะเนการเสียเลือดด้วยวิธีใช้ถุงตวงเลือดได้มากกว่า 500 มิลลิลิตร ในผู้ป่วยกลุ่มนี้การคาดคะเนการเสียเลือดด้วยตาเปล่าคาดคะเนได้ต่ำกว่าการใช้ถุงตวงเลือด ร้อยละ 50.2 โดยแพทย์ และร้อยละ 59.9 โดยพยาบาล **สรุป** : การคาดคะเนปริมาณการเสียเลือดหลังคลอดด้วยตาเปล่าโดยแพทย์และพยาบาลไม่มีความแม่นยำโดยเฉพาะในรายที่มีการเสียเลือดปริมาณมาก

คำสำคัญ : การคาดคะเนการเสียเลือดด้วยตาเปล่า การตกเลือดหลังคลอด

Introduction

Postpartum hemorrhage defined as losing blood \geq 500 ml for those who give birth vaginally and \geq 1,000 ml for women who have a cesarean delivery¹. Currently, maternal deaths from childbirth are reduced. Despite the increasing number of hospitals and the availability of blood substitutes, the postpartum hemorrhage remains a major cause of maternal death because of inaccurate postpartum hemorrhage predictions and inappropriate treatment².

There are many experimental methods of blood loss estimations. However, the most commonly used is the visual estimation of postpartum blood loss. The study of visual estimation of postpartum blood loss is significantly different from the actual amount of blood loss. Several researchers, such as Bose³ demonstrated that the visual blood loss estimation was lower than the real quantity of blood loss. They made experiments by clinical scenarios (Objective Structured Clinical Examination (OSCE) style stations) to study the inaccuracy of the visual blood loss estimation method. Teams of obstetricians, anesthetists, midwives and healthcare assistants participated to this experiment similar to another study made by Moscati⁴.

Study by Maslovtiz⁵ about the ability to visualize blood loss, showed that resident and physicians who used this method had

tendency to underestimate by 49.0% lower than the actual blood loss. Midwives also had wrong estimations by 40.0% lower than the real blood loss. Therefore the visual blood loss estimation method during childbirth is often inaccurate and lower than the real blood loss. This inaccuracy can cause delayed in diagnosis of postpartum hemorrhages and unpleasant outcomes.

Significant difference between visual estimation and actual blood loss have been consistently demonstrated in several studies³⁻⁵. Visual blood loss estimation is routinely used at Krabi Hospital. Accurate estimation of blood loss, prompt recognition and early treatment postpartum hemorrhage is crucial. Delayed diagnosis and treatment of postpartum hemorrhage may place the patient at increased risks of adverse pregnancy outcome¹.

Objective of this research is to compare the visual blood loss estimation method and the blood loss measurement by the gravimetric method during the vaginal delivery. The gold standard of this research is measurement by the gravimetric method which is objective method and has more reliable result. Furthermore, healthcare providers may consider converting from visual estimation to more accurate ways of blood loss estimation as a result from the study.

Materials and Methods

After approval by the Krabi Ethics Committee, a cross sectional analysis was conducted. The data was collected from 100 pregnant women who gave vaginal birth at Krabi Hospital during December 1st, 2015 to January 31st, 2016. The inclusion criteria were the pregnant women who gave vaginal birth with gestational age over or equal to 24 weeks at the Krabi Hospital while pregnant women with prenatal hemorrhage within 24 hours or the ones who refused to participate as well as twin pregnancy were excluded from the study. The computer and software were used for data collection and analysis. In the quantitative comparison, the T-test was used given the data normally distributed and the statistical significant p-value is less than 0.05.

Results

The total number of qualified participants to the study is 100 with the ages between 15-36 years old. The average age is 26.8 years. All participants gave vaginal birth spontaneously. Only 8 uterine atony and 2 vaginal/cervical tear were occurred in the present study. The blood loss estimation using visual method was made by 2 physi-

cians (26 patients; 26.0%) and 4 nurses (74 patients; 74.0%).

The average estimations with the gravimetric method were 350.0 ml whereas the estimations with the visual blood loss estimation method were 256.4 ml by physician and 207.8 ml by nurse respectively. These data implied that the estimations by the visual blood loss estimation method of both physician and nurses were 26.7% and 40.6%, respectively lower than the gravimetric method. (Table 1)

When divided patient into two groups according to the amount of blood loss, first group is ≥ 500 mL and second group is < 500 mL. (Table 2) In the group of postpartum hemorrhage, ≥ 500 ml blood loss, the average estimations with the gravimetric method was 869.4 ml whereas the estimations with the visual blood loss estimation method were 432.6 ml by physicians and 348.6 ml by nurses respectively. On the other hand group of lower amount of blood loss, < 500 ml, and the average estimations with the gravimetric method was 208.0 ml whereas the estimations with the visual blood loss estimation method were 191.2 ml by physicians and 163.8 ml by nurses respectively.

Table 1 The correlation between visual blood loss estimation and gravimetric method.

Type of estimation	N	Mean (ml)	SD (ml)	P value
gravimetric method	100	350.0	292.1	Reference
Visual estimation by physician	26	256.4	125.4	0.006
Visual estimation by nurse	74	207.8	118.9	0.001

*Data was analysis by T-test and statistical significance at p value < 0.05

Table 2 The correlation between visual blood loss estimation and gravimetric method in patient with and without postpartum hemorrhage.

Type of estimation	EBL by gravimetric method < 500 ml (n=33)			EBL by gravimetric method ≥ 500 ml (n=7)		
	Mean	SD	P value	Mean	SD	P value
	(ml)	(ml)		(ml)	(ml)	
Gravimetric method	208	100.2	Reference	869.4	217.6	Reference
Visual estimation by physician	191.2	81.5	0.378	432.6	97.9	0.001
Visual estimation by nurse	163.8	86.1	0.033	348.6	122.5	0.001

*Data was analyzed using T-test and statistical significance at p value < 0.05

Discussion

The reference method of blood loss estimation in this study was gravimetric measurement. The result of this study showed that visual blood loss estimation method by physicians and nurses were 26.7% and 40.6% lower than the gravimetric method.

Subgroup analysis was done between ≥ 500 ml and < 500 ml blood loss by gravimetric method. The results showed that increased amount of blood loss reflexed wider gap between visual estimation and gravimetric measurement.

However, in the group of patients who had blood loss <500 ml demonstrated that the visual estimations by physician had no significant difference with the estimations given by gravimetric method. This result demonstrated that the visual estimation of blood loss was effective when the patient is bleeding in small quantity and visual blood loss estimation was done by experienced provider. However this method was less reliable when the patient is bleeding in large quantity. This may be the cause delayed diagnosis and treatment of the postpartum hemorrhage which can lead to other consequences.

The result of this study is compatible with the Moscati⁴. They reported that the visual estimation of blood loss was actually 49.0% lower than the reality. Another research by Kadri⁶ about the postpartum blood loss showed that the visual estimation was 30.0% lower than the estimation given by the gravimetric method. Our research demonstrated that the visual estimation method by physicians was 27.7% lower than the estimations given by the gravimetric method.

Toledo⁷, Duthie⁸, Buckland⁹ and Cheeranichanunth¹⁰ showed that visual blood loss estimation more underestimation when the patient is bleeding in large quantity. The gravimetric measurement and visualizing blood loss has no significant different in group with lesser amount of blood loss and visual estimation by physician. It is not consistent with studies from Cheeranichanunth¹⁰, Yoong¹¹ and Tall¹² which tend to overestimate when bleeding is in a small quantity.

The disadvantage of this research is method of this study which not included all of bleeding during vaginal delivery. The bleeding before cord clamping was not mea-

sured. However, due to contamination of amniotic fluid, urine, feces and vaginal discharge, which inaccurately expand blood loss estimation by gravimetric method. Even though we are careful about contamination, there is still minor contamination occurred during the study.

In addition, this study supported other studies in term of visual blood loss prediction have less accuracy. Currently, the prediction of visual estimation of blood loss still widely used. Health care providers should consider alternative ways that

provide precise estimation in order to reduce maternal mortality and morbidity from postpartum hemorrhage.

Conclusion

The blood loss estimation using visual method by physicians and nurses at Krabi Hospital is less accurate. There is significant difference in blood loss estimation between using visual method and gravimetric method as physicians and nurses made 26.7% and 40.6% lower than the estimation using gravimetric method accordingly.

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