
OBSTETRICS

Breastfeeding Assessment Score, Can It Be Used Effectively in Thai Population?

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ABSTRACT

Objective: To evaluate the effectiveness of the breastfeeding assessment score (BAS) in a Thai population to identify mothers who early stop exclusive breastfeeding in order to target early nursing interventions to encourage and support continued breastfeeding.

Material and Methods: From September 2010 to May 2011, this diagnostic test including an interview for BAS variables was collected from mothers prior to hospital discharge at postpartum ward and follow-up phone calls at 10 days postpartum. The sample size calculations were nine hundred and fifty eight mothers.

Results: Eight hundred and seventy eight mothers were enrolled in the study. The breastfeeding rate at 10 day of birth was 72.2%. Only 4 score variables (maternal age, previous breastfeeding experience, latching difficulty and breastfeeding interval) were statistically significant. The result could demonstrate an inverse correlation between the breastfeeding assessment score and the rate of cessation of breastfeeding at 10 days of age, likewise previous studies. The optimal cut-off score 8 showed a sensitivity of 53.7% and a specificity of 55.8 % to predict early cessation rate. The area under the ROC curve was 0.575.

Conclusions: In Thailand, a breastfeeding assessment score may not clinically effective in predicting early cessation of exclusive of breastfeeding then development of other new assessment system is necessary.

Keywords: breastfeeding, early cessation, breastfeeding assessment score

Introduction

The World Health Organization has recommended exclusive breastfeeding for the first six months of life due to the benefits of breastfeeding to both the infants and the mothers. Early cessation of breastfeeding is the major concern problem of discontinuation of breastfeeding. Breastfeeding is a preferred method of

infant feeding, with well documented health benefits for both mothers and infants and exclusive breastfeeding is therefore the recommended infant feeding for the first six months of life⁽¹⁾. Rajavithi Hospital, a tertiary care teaching hospital affiliated with Rangsit University, has been also promoting exclusive breastfeeding. All healthy mother-infant pairs are exclusive breastfed in

this hospital. However, in 2010, only in 64.1 % of women carried on with exclusive breastfeeding at 2 months after birth, with further reducing to 44.7% by 6 months after birth.

The cessation of breastfeeding as well as inadequate early follow-up may contribute to the increased incidence of readmission of breastfeeding infants for dehydration and jaundice⁽²⁾. Therefore, it is important to identify women at risk for early breastfeeding cessation before hospital discharge in order to target nursing interventions to prevent early unintended weaning.

A breastfeeding assessment score (BAS) was developed by Hall RT et al⁽²⁾. They studied in a suburban, white, middle class socioeconomic population before initial hospital discharge in attempt to evaluate the risk for cessation of breastfeeding by 7-10 days of age. The BAS is a scoring system based on 8 variables such as maternal age, previous breastfeeding experience, latching difficulty, breastfeeding interval, number of bottles feeding, previous breast surgery, maternal hypertension during pregnancy and vacuum vaginal delivery.

Based on previous studies, the BAS is easily and quickly performed before hospital discharge which accurately predicts the risk of breastfeeding cessation within 7-10 days of age. A cut-off of 8 would identify the cases with 67.5% of sensitivity and 69.5% of specificity. This tool may be used to facilitate lactation consultations in population at risk. Mercer et al⁽³⁾ used this tool in a suburban and a more diverse population and found that it was still predictive the continuation of breastfeeding. Likewise, Gianni et al⁽⁴⁾ confirmed that BAS could identify mothers who tended to stop exclusive breastfeeding. However, whether BAS could effectively be applied to our population, which has different culture and belief, has never been studied. Therefore this study was conducted to evaluate the effectiveness of BAS in a Thai population to identify mothers who early stop exclusive breastfeeding in order to target early nursing interventions to encourage and support continued breastfeeding.

Materials and Methods

The diagnostic study was designed for this study with sample size calculations were nine hundred fifty eight mothers. An interview was collected from mothers prior to hospital discharge from September 2010 to May 2011 at postpartum ward, Rajavithi Hospital and follow-up phone calls were made at 10 days of infants' age. The inclusion criteria were (1) Thai race with initiating breastfeeding at maternity ward (2) gestational age at birth 35-42 weeks (3) healthy mothers without maternal disease and pregnancy complications (4) healthy infants and (5) scheduled to go home together. The institutional ethics committee approved the study and mothers taking part in the study provided written consent at the time of interview at maternity ward.

The demographic variables included of socioeconomic data, maternal characteristics (maternal age, parity, smoking, maternal height, prepregnancy weight, pregnancy weight gain), infant characteristics (gender of the baby, gestational age, birth weight, APGAR score), and mode of delivery. All breastfeeding assessment score variables were prospectively collected with computerized storage.

The BAS is an 8-variable scoring tool that has a range of scores from -6 to 10. A lower score predicts a lower chance of continuing breastfeeding beyond 10 days of age. Five variables (maternal age, previous breastfeeding experience, latching difficulty, breastfeeding interval, and number of bottles used in hospital) are scored on a 0-2 scale. Maternal age receives 0 point for an age less than 21 year, 1 point for age of 21-24, and 2 points for an age greater than 24 years. Previous breastfeeding experience receives 0 points for difficulty latching with every feeding, 1 point for difficulty with half of the feedings, and 2 points for difficulty with less than 3 feedings. Breastfeeding frequency receives 0 points for a mean interval of greater than 6 hours, 1 point for an interval 3 to 6 hours, and 2 points for a mean interval less than 3 hours. Number of bottles in hospital receives 0 points for 2 or more bottles received in the hospital, 1 point for 1 bottle, and 2 points for no bottles received in the hospital. Two points should be subtracted for the presence each of

the variable of previous breast surgery, maternal hypertension during pregnancy or vacuum vaginal delivery.

Infants were considered exclusive breastfed when fed exclusively on mother's milk, including pumped breast milk. The only other permitted oral intakes were water, vitamin supplements or medication.

Statistical analysis: Descriptive statistics, the X2 test, binary logistic regression and receiver operative characteristic (ROC) were used as appropriate. Statistical significance was set at $p < 0.05$.

Results

Of 1,000 mothers enrolled to the study, 122 cases (12.2%) were excluded due to inability to follow-up within 14 days of age (10.4%) and no response to BAS inquiry (1.8%). The remaining 878 cases with completed data were available for analysis. Of them, 634 cases (72.2%) were still exclusive breastfeeding, and 244 (27.8%) had discontinued exclusive breastfeeding.

Baseline characteristics of the women were demonstrated: The mean (\pm SD) maternal age was 28.2 (\pm 6.35) years. The mean of gestational age (\pm SD) was 38.6 \pm 1.87 weeks and the mean of birthweight (\pm SD) was 3,101 \pm 427 g. Educational levels were categorized into low (\leq grade 9), medium (grade 10-12) and high

(>Bachelor's degree) in 39%, 32.5%, and 28.4%, respectively.

There were no cases with maternal hypertension and breast surgery in this study. Maternal age, previous breastfeeding experience, breastfeeding interval and latching difficulty were significantly associated with rates of continuation or cessation of exclusive breastfeeding. In contrast numbers of bottles of formula before enrollment and vacuum delivery were not significantly associated (Table 1). The variable "number of bottles of formula before enrollment" was constant because all healthy infants were exclusively breastfed in Rajavithi Hospital.

The mean \pm SD BAS in the present study was 7.57 \pm 1.52 points. The cessation rate was significantly correlated with BAS (Fig. 1) ($p = 0.03$). The mothers with a score < 8 had a cessation rate of 31.9 % (131 of 411) and mothers with score ≥ 8 had a cessation rate of 24.2% (113 of 354), significantly different (Chi-square; $p = 0.011$).

The ROC curve (Fig. 2) shows the relation between sensitivity and specificity. The optimal cut point value of 8 in our study shows a sensitivity of 53.7 % and a specificity of 55.8 % to predict early breastfeeding cessation rate. Area under the ROC curve was 0.575

Table 1. Adjusted Odd Ratios and Significance of the Variables for prediction of breastfeeding at 7-10 Days of Age

Variable	Current study (N= 878)		
	p-value	Odds ratio	95% CI
Maternal age	<0.001	0.64	0.505-0.812
Previous breastfeeding experience	<0.001	1.859	1.434-2.410
Latching difficulty	<0.001	1.247	1.024-1.520
Breastfeeding interval	0.002	1.367	1.055-1.773
No. of bottles of formula before enrollment	constant	-	-
Vacuum delivery	0.875	1.033	0.512-2.083

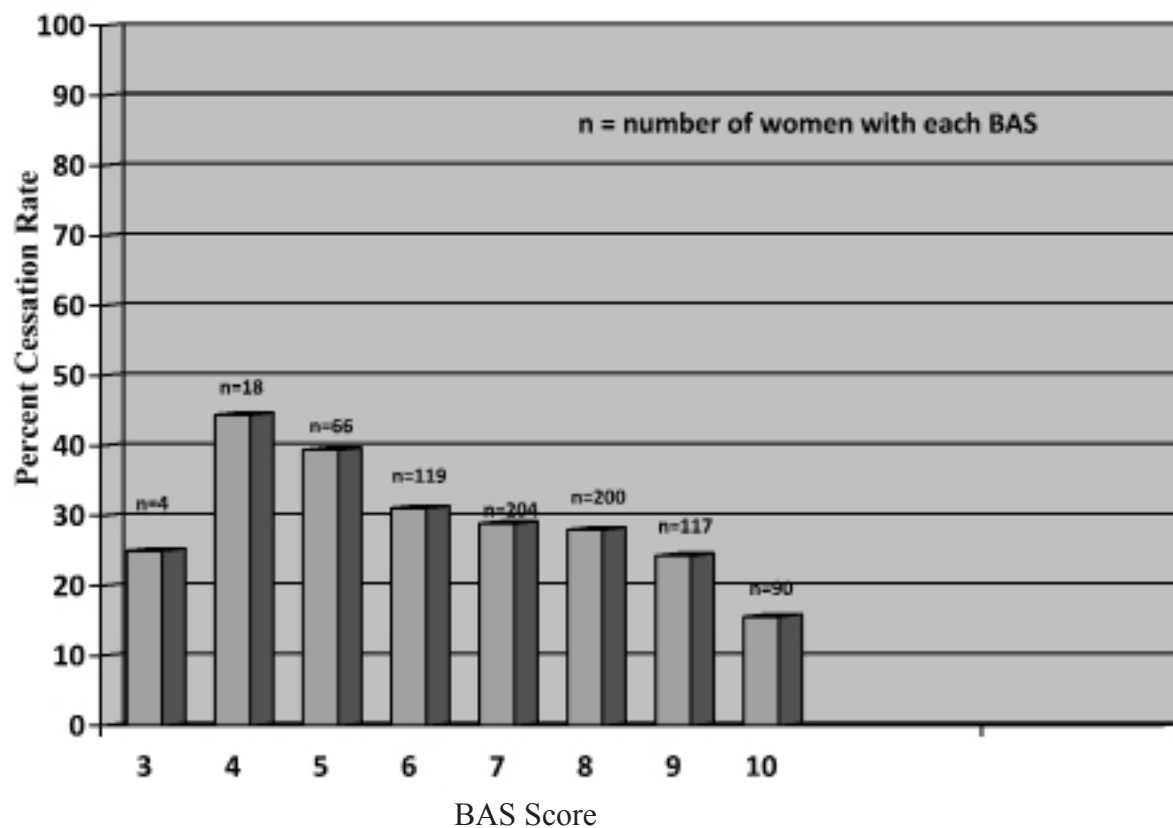


Fig. 1. Percentage of cessation rates of breastfeeding < 10 days of age by BAS (breastfeeding assessment score)

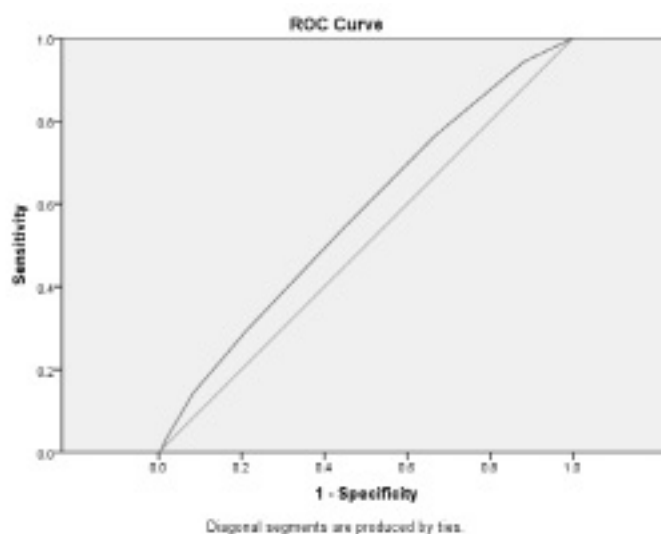


Fig. 2. ROC curve for a test to predict the continuation of breastfeeding at 10 days of age.

Discussion

Increasing of the breastfeeding duration is important for mothers' and infants' health. All attempts must be made to promote a higher rate of exclusive breast feeding. Therefore, prediction of women at risk for early breastfeeding cessation is crucial to guide interventions aimed at increasing duration of breastfeeding. Several tools have been developed to help accurately predict breastfeeding cessation^(2,5-9). Breast feeding assessment score (BAS) is one of the well-accepted tools that can be performed easily and quickly. Based on previous studies⁽²⁻⁴⁾, BAS could reliably predict women at risk for early breastfeeding cessation.

The mean \pm SD of BAS in the present study (7.57 ± 1.52 points) was similar to those in the previous study (7.8 ± 1.7 points). The cessation rate was significantly correlated with BAS (Fig. 1) ($p = 0.03$). The mother with a score < 8 had a cessation rate of 31.9 % (131 of 411) and mother with score ≥ 8 had a cessation rate of 24.2% (113 of 354), significantly different (Chi-square; $p=0.011$) similar to previous study (the breastfeeding cessation was 10.5%, if BAS ≥ 8 had a cessation rate of 5% while if BAS < 8 had a cessation rate of 21%). Even though our findings indicated that BAS significantly correlated with the cessation rate of breastfeeding but it was clinically ineffectiveness to predict such early cessation because of low sensitivity (53.7%) and specificity (55.8%). Area under the ROC curve was 0.575 different from previous study (ROC = 0.75).

The ineffective prediction of BAS in this study can be possibly explained by the following reasons. Firstly, population in our study may be different from previous study in term of socioeconomic status, educational background and culture. Our study included an urban, Asian population while previous studies included a suburban, white population. There was evidence that the continuation of breastfeeding varied depending on the ethnicity, cultural, socioeconomic levels and other demographic factors^(6,10-14).

Secondly, only previous breastfeeding experience, latching difficulty and breastfeeding interval were

statistically significant variables in our study whereas number of bottles of formula before enrollment and vacuum delivery had no significance, different from the original study. Surprisingly, younger mothers in this study were more likely to continue breastfeeding than the older ones, inversely different from several previous reports^(2,3,11,15-17).

Thirdly, many survey reports have been published regarding the factor associated with the continuation of breastfeeding. These factors vary from country to country, reflecting different influences due to the difference in various circumstances⁽¹⁸⁾.

The strength of this study was relied on a large sample size than previous study so that it gains enough power in predicting outcomes and a use of multivariate analysis to control several variables.

In conclusion, breastfeeding is the human behavior which many different factors can influence a cessation of breastfeeding in different countries. The complexities of the factors that affect continuation of breastfeeding make it really difficult to develop a tool that can predict an early breastfeeding cessation that can use in every country. This findings suggest that a new or modified BAS system is needed to develop for our own population. It is unlikely that conventional BAS suggested by Hall RT is useful in our setting.

Conflict of interest statement: None.

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การประเมินประสิทธิผลในการทำนายโอกาสการหยุดให้นมแม่หลังคลอดโดยใช้ Breastfeeding Assessment Score ในประชากรชาวไทย

พจนีย์ ผดุงเกียรติวัฒนา, ภาวินี ปลิวมา

วัตถุประสงค์ : การใช้ breastfeeding assessment score เพื่อประเมินประสิทธิผลในการทำนายโอกาสการหยุดให้นมแม่หลังคลอดในกลุ่มประชากรไทย เพื่อนำไปสู่การแก้ไขและการสนับสนุนมารดาให้นมแม่ต่อเนื่อง

วัสดุและวิธีการ : ทำการศึกษาแบบ Diagnostic test ในมารดาหลังคลอดโดยพยาบาลวิจัย ได้สอบถามมารดาตามแบบสอบถามและโทรศัพท์ติดตามหลังทารกอายุได้ 10 วัน ในช่วงเดือน กันยายน พ.ศ. 2553 – พฤษภาคม พ.ศ. 2554 โดยคำนวณขนาดตัวอย่างได้ 958 ราย

ผลการศึกษา : มารดาที่เข้าเกณฑ์การวิจัยทั้งหมด 878 คน พบว่าอัตราการให้นมแม่อย่างเดียวยังในช่วงหลังคลอด 10 วันแรก คิดเป็นร้อยละ 72.2 ตัวแปรที่ใช้ในการประเมิน breastfeeding assessment score พบว่ามีนัยสำคัญทางสถิติ 4 ตัวแปร จาก 8 ตัวแปร ได้แก่ อายุมารดา ประสบการณ์การเลี้ยงลูกด้วยนมแม่ ความยาก-ง่ายในการเข้าเต้า ระยะห่างของการให้นมแม่ และ คะแนนที่เพิ่มขึ้นเป็นสัดส่วนผกผันกับอัตราการหยุดให้นมแม่ โดยพบว่ามี ความไวร้อยละ 53.7 และ ความจำเพาะร้อยละ 55.8 ในการทำนายโอกาสการหยุดให้นมแม่ และเมื่อพิจารณาพื้นที่ใต้กราฟ (ROC curve) ได้เท่ากับ 0.575

สรุป : การนำ breastfeeding assessment score มาใช้ในประเทศไทย ไม่สามารถประเมินประสิทธิผลในการทำนายโอกาสการหยุดให้นมแม่หลังคลอดได้ จึงควรมีการพัฒนาเครื่องมือที่เหมาะสมที่จะนำมาใช้ในการทำนายโอกาสการหยุดให้นมแม่ในประเทศไทยต่อไป
