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Relationship of Flamm Geiger Scores with Success Vaginal Delivery

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ABSTRACT

Vaginal Birth After Cesarean (VBAC) is vaginal delivery on woman with history of cesarean delivery. A statement by Cragin (1916), "Once a cesarean, always a cesarean", has been a growing paradigm in the community which makes VBAC not a common practice. Flamm Geiger Scoring System is used to predict the likelihood of success in VBAC. The purpose of this research was to find out the association between Flamm Geiger score and the success of vaginal delivery. This research was an analytic observational study with cross sectional design. The population of this research were all patients that underwent delivery in drMohammad Hoesin General Hospital Palembang from January to December 2014 and the sample were all delivering patient with history of cesarean delivery.The data were taken from patient's medical record and analyzed using Chi Square test or its alternative test (Fisher's Exact Test). From 92 samples, there were 25 patients (27,2%) succeeded in undergoing VBAC and 67 patients (72,8%) delivered with repeated cesarean. There was an increasing probability for a successful VBAC ranging from 0% in samples with a score of 0-2 to 100% in samples with a score of 8-10. The result showed that there was an association between Flamm Geiger score and the success of vaginal delivery (p=0,000). There is association between Flamm Geiger score and the success of vaginal delivery in dr. Mohammad Hoesin General Hospital Palembang from January to December 2014.

1. Introduction

Labor or delivery is the period from the onset of regular uterine contractions to expel the fetus until placental expulsion occurs.1 Factors that influence labor are 4P, namely Power (contraction and strength of the uterus), Passage (hard and soft birth canal), Passenger (position, fetal presentation and development), and Psyche (psychic) .2 If one or more of these factors is not fulfilled, delivery by action will be an option. Actions taken include labor induction, forcep or vacuum delivery, and cesarean section.[1]

Caesarean section is the birth of a fetus through an incision in the abdominal wall (laparotomy) and uterus (hysterotomy). 3 Labor with cesarean section is indicated for various things, such as dystocia, fetal distress, abnormal presentation, history of previous cesarean delivery and patient request. Every year labor with cesarean section continues to increase. In 2011, the rate of cesarean section increased to 32.8% of total births in the United States.4 In developing countries, such as Indonesia, cesarean section reached 15.3%.[5]

Although reported to reduce maternal and fetal mortality rates, cesarean section can cause various complications and maternal morbidity rates are

doubled in cesarean section than vaginal delivery.6 The most common complications are infection, bleeding, and thromboembolism. The high incidence and complications due to cesarean section made the World Health Organization (2009) set a target of delivery with cesarean section of 5-15% in each country.[7]

A woman who has had a cesarean delivery will have scar on her uterus so that it is contraindicated for giving birth. A statement by Cragin (1916), "Once a caesarean section, always a caesarean", is still frequently mentioned and has become a permanent paradigm in society.8 Increasing labor rates with cesarean section make the American College of Obstetricians and Gynecologists (1988) recommend to do a trial of vaginal delivery for cesarean section or often called vaginal birth after caesarean (VBAC).[9]

Several factors that can influence the trial of vaginal delivery include a history of cesarean section, a history of vaginal delivery, fetal weight, distance of pregnancy, indications and incisions in previous cesarean section.3,10 Percentage of successful vaginal delivery trials in a woman is reported to be around 56 -80% and of course must be done with very strict supervision.11 However, vaginal delivery of cesarean section can not be done in all pregnant women. In certain circumstances, VBAC is contraindicated and delivery of cesarean section (Elective Repeat Cesarean / ERC) will be performed. ERC was chosen to avoid the occurrence of uterine rupture, infant death, and various other complications that could endanger the mother and fetus.[11]

To predict the success of a cesarean delivery trial for vaginal cesarean delivery, it can be assessed using a scoring system. Much research has been done to determine the grading system that is most suitable for assessing VBAC, one of which is the Flamm and Geiger study. The Flamm Geiger scoring system uses several indicators, which include maternal age, vaginal delivery, indications of previous cesarean delivery, thinning, and cervical dilatation. The accumulation of scores from these indicators will provide a picture of the success of vaginal delivery in cesarean section.[12] According to Flamm and Geiger (1997), an increase in the VBAC assessment score is directly proportional to the success of vaginal delivery.[13] The results of this study have been validated and can be used easily by health workers.[12] Based on the description above, the paradigm that has long developed in the community makes the trial of vaginal delivery of cesarean ex-cesarean section has not been done much and makes women tend to undergo recurrent cesarean section. With the prediction score of cesarean delivery, it will be easier to know whether a woman can undergo vaginal delivery or have to undergo recurrent cesarean section. This is the author's consideration to conduct research on the relationship of Flamm geiger scores with the success of vaginal delivery in the period January to December 2014 at the RSUP dr. Mohammad Hoesin Palembang.

2. Methods

This type of research is analytic observational with cross sectional design. The study population was all maternity patients at RSUP dr. Mohammad Hoesin Palembang from January to December 2014 with a sample of all maternity patients with a history of cesarean section. The study inclusion criteria were a history of one-time cesarean section and exclusion criteria were incomplete or missing medical record data. In this study no sampling method was performed. All maternity patients with a history of cesarean section who met the inclusion criteria would be taken as a study sample.

The independent variable in the study was the Flamm Geiger score and the dependent variable was the success of vaginal delivery. Data is taken from the patient's medical record and analyzed using the Chi

Square statistical test or an alternative test (Fisher's Exact Test).

3. Results and discussion

Following are the results of research on 92 samples. Univariate analysis took the form of the distribution of types of labor and the characteristics of VBAC patients, which consisted of maternal age, vaginal history, indications of cesarean section at first labor, leveling and cervical dilatation.

Table 1. Frequency distribution of forms of former delivery for sesaria section

Type of childbirth	Amount (N)	Percentage (%)
Vaginam	25	27,2
Caesarean Section	67	72,8
total	92	100

In Table 1, there were 67 patients who returned to cesarean section in labor (72.8%) and 25 cesarean delivery (VBAC) vaginal births (27.2%).

Table 2. Characteristics of VBAC patients

Variable	Frequency (AND)	Percentage (%)
Age		
< 40 year	25	100
≥ 40 year	0	0
Total	25	100
Vaginal history		
Before and After sc	1	4
After sc	8	32
Before sc	2	8
There is no	14	56
Total	25	100
Indication of the First Sesaria Section		
Besides failing to advance labor	21	84
Failed to advance labor	4	16
Total	25	100
Cervical Leveling		
>75%	20	80
25-75%	3	12
<25%	2	8
Total	25	100
Cervical Dilatation		
>4cm	19	76
≤4 cm	6	24
Total	25	100

Age

Based on Table 2, VBAC patients aged <40 years were 25 people (100%) and none were ≥40 years old.

History of vaginal delivery

Based on Table 2, VBAC patients who had a vaginal history before and after cesarean section were 1 person (4%), after cesarean section were 8 people (32%), before cesarean section were 2 people (8%), and the most do not have a vaginal history, as many

as 14 people (56%).

Indication of the First Sesaria Section

Based on Table 2, VBAC patients who have indications other than failing to advance in previous labor are the most indications, amounting to 21 people (84%) and the rest failing to progress in labor as many as 4 people (16%).

Cervical Leveling

Based on Table 2, VBAC patients with cervical level> 75% are the most, 20 people (80%). In the cervical flattening category 25-75% there are 3 people (12%) and <25% of 2 people (8%).

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Based on Table 2, VBAC patients with cervical dilatation> 4 cm were the most, 19 people (76 %%) and the rest included in the cm4 cm category of 6 people (24%).

Table 3. Frequency distribution of geiger flamm scores

Flamm Geiger score	Total (n)	Precentage (%)
0-2	8	8,7
3	30	32,6
4	16	17,4
5	15	16,3
6	13	14,1
7	6	6,5
8-10	4	4,3
Total	92	100

Based on the results of the study obtained the most Flamm Geiger scores on a score of 3 as many as 30 people (32.6%) and at least at a score of 8-10 as many as 4 people (4.3%). Other scores are 0-2 with 8 people (8.7%), 4 have 16 people (17.4%), 5 have 15 people (16.3%), 6 have 13 people (14.1%), and a score of 7 as many as 6 people (6.5%).

In bivariate analysis, the relationship between the characteristics of VBAC and Flamm Geiger scores with the type of cesarean delivery was found.

Table 4. Relationship between age and type of childbirth form of sesaria section

Age	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N		N	%	
<40	25	27,5	66	72,5	1,000*
≥ 40	0	0	1	100%	

** chi square alternative test, the fisher test*

From the table, it can be seen that more labor in the age group <40 years, which is as many as 91 people. In the age group <40 years, VBAC is 25 people (27.5%) and cesarean section is 66 people (72.5%). At age ≥ 40 years, no one underwent VBAC and only one person returned to cesarean section.

After performing a chi square statistical test, 2 cells (50%) were obtained with an expected value of less than 5 or there were more than 20% of the number of cells so that the data could not be analyzed using the chi square test. For this reason, an analysis was carried out using an alternative chi square test,

namely the Fisher test and the results obtained were p = 1,000 (p> 0.05), which means that H0 was accepted. That is, there was no statistically significant relationship between age and type of used labor cesarean section.

Table 5. Relationships in vaginal history and type of delivery for cesarean forms

History Vaginam	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N	%	N	%	
Before and after sc	1	50	1	50	0,000*
After sc	8	100	0	0	
Before sc	2	25	6	75	
None	14	18,9	60	81,1	

* *chi square alternative test, the fisher test*

From the table, it was found that labor was more common in the group with no vaginal history, as many as 74 people. Of the 74 people, 14 (18.9%) successfully underwent VBAC and 60 (81.1%) returned to cesarean section. In the category before and after cesarean section, VBAC was 1 person (50%), the category after cesarean section was 8 people (100%) and the category before cesarean section was 2 people (25%).

Existing data were then analyzed using the chi square statistical test and obtained 4 cells (50%) with a value of less than 5 or there were more than 20% of the number of cells so that the data could not be analyzed using the chi square test. For this reason, an analysis was carried out using an alternative chi square test, namely the Fisher test and the results obtained p = 0,000 (p <0.05), which means there is enough evidence to reject H0. That is, there is a statistically significant relationship between vaginal history and type of cesarean delivery.

Table 6. Relationship between the indications of first cesarean section and type of delivery of cesarean section

Section Indications	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N	%	N	%	
Besides failing to advance labor	21	29,6	50	70,4	0,341**
Failed to advance labor	4	19	17	81	

** *Chi Square Test*

From the table, it was found that labor occurred more in the category of indications in addition to failing to advance labor in the previous labor, as many as 71 people, 21 people (29.6%) successfully underwent VBAC and 50 people (70.4%) returned to cesarean section. In the category of unsuccessful labor, 4 VBACs (19%) and 17 cesarean sections were repeated (81%).

The data were then analyzed using the chi square statistical test and the results obtained p value = 0.341 (p> 0.05), which means that H0 was received. This means that there is no statistically significant relationship between the indications of first cesarean section and the type of cesarean delivery.

Table 7. Relationship of cervical leveling and type of delivery for former cesarean section

Registration	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N	%	N	%	
>75%	20	58,8	14	41,2	0,000**
25-75%	3	16,7	15	83,3	
<25%	2	5	38	95	

** *Chi Square Test*

From the table it can be seen that labor is more common in the cervical flattening category <25%, as many as 40 people. Of these 40 people, 2 (5%) successfully underwent VBAC and 38 (95%) returned to cesarean section. But the success of VBAC was found most in the cervical flattening category> 75%, as many as 20 people (58.8%), while only 3 people (16.7%) in the 25-75% category.

Data were then analyzed using the chi square statistical test, the results obtained p = 0,000 (p <0.05), which means there is enough evidence to reject H0. This means that there is a statistically significant relationship between cervical flattening and the type of cesarean delivery.

Table 8. Relationship of cervical dilatation and form of delivery for cesarean section

Dilated	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N	%	N	%	
>4 cm	19	79,2	5	20,8	0,000**
≤4 cm	6	8,8	62	91,2	

** *Chi Square Test*

From the table, more labor occurred in the category of cervical dilatation ≤4 cm, which was 68 people. of the 68 people, 6 (8.8%) successfully underwent VBAC and 62 (91.2%) returned to cesarean section. The highest number of patients who successfully underwent VBAC in the category of cervical dilatation> 4 were 19 people (79.2%), while those who returned underwent cesarean section were 5 people (20.8%).

Then the chi square statistical test was performed and the results obtained p = 0,000 (p <0.05), which means there is enough evidence to reject H0. That is, there is a statistically significant relationship between cervical dilatation and the type of cesarean delivery.

Table 9. Relationship between VBAC score and type of childbirth for cesarean forms

Flamm Geiger score	Type of Childbirth				*p value*
	Vaginam		Section Sesaria		
	N	%	N	%	
0-2	0	0	8	100	0,000**
3	0	0	30	100	
4	1	6,3	15	93,8	
5	4	26,7	11	73,3	
6	10	76,9	3	23,1	
7	6	100	0	0	
8-10	4	100	0	0	

** *Chi Square Test*

In the table you can see more labor in the score 3 category, which is as many as 30 people. Of the 30 people, none had undergone VBAC and 30 (100%) returned to cesarean section. The most VBAC occurred in the category score of 6 namely 10 people (76.9%), while cesarean section was 3 people (23.1%). The highest percentage of VBAC success is in the category of scores 7 and 8-10, which is 100%, while the score category 0-2 has the lowest percentage of success that is 0%.

From the results of the chi-square statistical test there were 8 cells (57.1%) with an expected value of less than 5 or there were more than 20% of the number of cells so that the data could not be analyzed using the Chi Square test. For this reason, an analysis was performed using the Chi Square alternative test, the Fisher's exact test and the results obtained p = 0,000 (p <0.05), which means there is a statistically significant relationship between the VBAC score and the success of vaginal delivery.

Type of childbirth

Based on research conducted, more patients underwent repeat cesarean section, as many as 67 people (72.8%). This is comparable with research conducted by Emelda14 (2013) conducted at the RSUP dr. Mohammad Hoesin Palembang who stated that repeat cesarean section was mostly performed on 114 cesarean patients (76.8%) and 39 (23.2%) who had undergone VBAC. However this is different from the results stated by Shaheen et al. 15 (2014), of the 95 maternity patients, 68 (71.6%) successfully underwent VBAC. The difference in VBAC number can be caused by many factors. One of them is nonclinical factors, such as the place of delivery and medical personnel who handle labor.[13]

Childbirth characteristics

Age

From the results of the study, more births occur at age <40 years. This study is in line with research conducted by Flamm and Geiger (1997) on 5,002 people, there are 4872 people (97.3%) who have age <40 years and as many as 3,667 people (75.26) successfully undergo VBAC. This indicates that younger ages tend to be able to successfully undergo VBAC.[13]

Vaginal history

Based on the results of the study, labor is more common in someone who has no vaginal history. VBAC was also found more in categories that had no vaginal history. This is not in accordance with the research of Zaitoun, et al16 (2013) which suggests that someone who has a vaginal history will tend to successfully undergo VBAC of 138 people (71.1%). According to Flamm and Geiger13 (1997), women

who have a vaginal history, the success rate of VBAC will be even higher. ACOG9 (2004) also states that women with twice a history of low transverse cesarean delivery but who have a history of vaginal delivery should be considered candidates for the VBAC trial.[3]

First section indication

The results showed more patients with indications of a first cesarean section other than due to failure to advance labor, as well as VBAC. This is in accordance with research Flamm and Geiger13 (1997), which states that the delivery of the former cesarean section occurs most frequently in people with indications other than failing to progress in labor as many as 2,689 people (53.75%) and 2,157 of whom successfully underwent VBAC. According to Gabbe et al. 17 (2012), a history of cesarean section with an indication of DKP or a stalled labor has a success rate of around 50-60%.

Cervical leveling

Based on the results of the study, the value of cervical level was more prevalent in the value of cervical level <25%. However, VBAC is more common in someone with a cervical level of> 75%, 20 people (58.8%) out of a total of 34 people with a value of> 75%. In accordance with Flamm and Geiger13 research (1997), of 5,002 people there were 2,484 (49.6%) who successfully underwent VBAC with cervical level> 75%. In normal labor, cervical flattening is a physiological event in which the fetus can be expelled. So it should be a greater cervical flattening value will increase the likelihood of VBAC success.

Cervical dilatation

From the results of the study obtained the most cervical dilatation at ≤4 cm. This is in line with research conducted by Shaheen et al. 18 (2014) which states that patients with a history of cesarean section are more at the value of cervical dilatation <4 cm, which is 86 people (90.5%). But in the study conducted, VBAC was more common in patients with cervical flattening values> 4 cm, namely as many as 19 people (79.2%) of a total of 24 patients with the same value. According to Flamm and Geiger13 (1997), cervical dilatation values> 4 cm are more likely to undergo VBAC. In normal labor, cervical dilatation begins from the first stage of labor until complete opening (10 cm) occurs and fetal expulsion occurs. So that the cervical dilatation value increases, the greater the chances of success of VBAC.

Geiger flamm score and type of former cesarean delivery

VBAC is a solution to reduce the increase in cesarean section rates. However VBAC has not been done much because of the various risks that accompany it18, such as uterine rupture, infection, and even death. One of the assessments that can be done to determine the success of VBAC is the Flamm Geiger Scoring System. This scoring system assesses several characteristics, as previously described, namely maternal age, vaginal history, indication of first cesarean section, cervical flattening, and cervical dilatation.[13]

In this rating system, there will be very few people who score high, because it is difficult to meet all the characteristics that exist. For example, if someone does not have a history of vaginal delivery it is certain that the score will not be more than 6. So that does not mean that people who have low scores will not have the possibility of successfully undergoing VBAC. This assessment system will make it easier for medical staff to estimate what percentage of VBAC success a woman has and provide safer delivery options.

From the results of the study, the VBAC trial

scores in the 0-10 range have varying frequency distributions. Table 16 shows that of the 67 patients who performed cesarean section, a score of 3 was the most, 30 people. In addition, from a total of 25 patients who underwent VBAC, a score of 6 was the most, namely 10 people. In a study conducted by Flamm & Geiger13 (1997), labor trials in patients with a history of cesarean section majority had a score of 5, as many as 1,324 (26.46%) of a total of 5,003 patients.

Statistical test results obtained p = 0,000 (p <0.05), which means there is a significant relationship between VBAC scores and the success of vaginal delivery. At low scores, ie 0-2 and 3, the percentage of success is 0%. Whereas the high scores, namely 7 and 8-10, have a 100% success rate. As the score increases, the probability of success of the VBAC also increases. This is consistent with what was mentioned in the Flamm & Geiger13 study (1997), from the 0-10 score range, the success rate of VBAC ranges from 49% in patients with a score of 0-2 and 95% in patients 8-10. So the higher the score, the higher the likelihood of someone to be able to successfully undergo vaginal delivery of a cesarean section.

4. Conclusion

The Flamm Geiger score increases, the chances of a successful vaginal delivery for cesarean

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