



## HOW CAN MATERNAL AGE AND AMOUNT OF PARITY AFFECT THE HIGH DEGREE OF PERINEUM LACERATION AND NEONATAL ASPHYXIA IN VACUUM EXTRACTION LABOR?

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### ABSTRACT

**Background:** Complications that often occur in vacuum extraction are third and fourth degree lacerations and neonatal asphyxia. Apart from being influenced by the existing vacuum extraction factors, the incidence of neonatal asphyxia and perineum laceration is also influenced by several maternal factors including maternal age and parity. **Objective:** To prove the relationship between maternal age and parity with perineum laceration and neonatal asphyxia after vacuum extraction. **Methods:** This study was an analytic observational study with a cross-sectional approach. The minimum sample required is 26 patient data. The data used were data from the medical records of vacuum extraction patients at Dr. Kariadi General Hospital Medical Centre from August 2019 to May 2020 by means of consecutive sampling. The determination of asphyxia is when the APGAR score is  $\leq 7$  and the degree of laceration is seen from the degree of severity, namely 1<sup>st</sup> and 2<sup>nd</sup> degree (less comorbidity) and 3<sup>rd</sup> and 4<sup>th</sup> degree (severe comorbidity). Then the data were analyzed by SPSS program. **Results:** From 26 mothers, we found that mothers who had risky age were 27% and risky parity were 23%. From 26 mothers, 31% had 3<sup>rd</sup> and 4<sup>th</sup> degree lacerations and 15% neonatal asphyxia. Chi-square test showed that there was a significant relationship between maternal age with perineum lacerations ( $p = 0.014$ ), maternal age with neonatal asphyxia ( $p = 0.047$ ), total parity with perineum lacerations (0.004), total parity with neonatal asphyxia ( $p = 0.028$ ). **Conclusion:** There is a relationship between maternal age and parity with perineum lacerations and neonatal asphyxia after vacuum extraction.

**Keywords:** Maternal age, parity, asphyxia, perineum laceration, vacuum extraction

### INTRODUCTION

The morbidity of vacuum extraction in a cohort study showed that the morbidity in the mother was following grade 3 and 4 lacerations (15.8%), other lacerations (5.3%), bleeding (5.2%), and maternal infections (9.5%).), and length of stay more than 5 days (0.3%).<sup>1</sup> Whereas in other studies, the major complications that occurred in infants after vacuum extraction were brachialis plexus injury (0.2%), cranial fracture (0.1%)., seizures (0.2%), intracranial hemorrhage (0.2%), subgaleal bleeding (0.1%), encephalopathy (0.1%), APGAR fifth minute score less than 7 (0.3%), and the rest occurred in minor complications (24.4%).<sup>2</sup>

From the data above, the most common complications in mothers were lacerations grade 3 and 4. In a large population-based retrospective study of more than 2 million vaginal deliveries, the frequency of severe perineum injury was recorded as 11.5% in nulliparous patients, 13.8. % in patients with vaginal delivery after caesarean delivery, and 1.8% in multiparous patients.<sup>3</sup> Another study conducted by Ramon in 2015 showed that there was

a significant relationship between maternal age and degree of laceration (OR = 0.994, CI: 0.970–1.018)<sup>4</sup>

Meanwhile, the output of vacuum extraction in infants can cause the head of the succedaneum, cephalhematoma, asphyxia, scalp laceration and other trauma which can cause fetal asphyxia.<sup>7</sup> Research at Dr. Hospital Saiful Anwar showed that there was a relationship between parity and maternal age with the incidence of neonatal asphyxia, with  $p = 0.034$  for parity,  $p = 0.021$  for maternal age ( $p$  less than 0.05).<sup>8</sup>

Based on the above background, the authors wanted to know the relationship between maternal age and parity with perineum laceration and neonatal asphyxia after vacuum extraction in Dr. Kariadi which may produce a different relationship from previous studies because it is related to the vacuum extraction action.

### METHOD

This study was an analytic observational study with a cross-sectional approach. This research was conducted in the medical record installation of



Dr. Kariadi from July to November 2020. The minimum sample required in this study is 26 patient data. The data used were data from the medical records of vacuum extraction patients at Dr. Kariadi Semarang from August 2019 to May 2020 which met the inclusion and exclusion criteria by means of consecutive sampling.

The risk factors that will be examined in this study are mother age and amount of parity. The mother at risky age is  $> 20$  or  $> 35$  years and not at risky age is 20-35 years. The mother at risky parity is  $< 2$  or  $> 3$  and not risky parity is 2-3. The determination of asphyxia is when the APGAR score is  $\leq 7$  and the degree of laceration is seen from the degree of severity, namely 1<sup>st</sup> and 2<sup>nd</sup> degree (less comorbidity) and 3<sup>rd</sup> and 4<sup>th</sup> degree (severe comorbidity).

The inclusion criteria in this study were mothers who had given birth with difficulties, so that there was vacuum extraction assisted, single pregnancy, anterior presentation, intrauterine, gestational age  $\geq 34$  weeks, birth weight  $\leq 4000$  grams, recorded in the medical record. And for the exclusion criteria in this study were incomplete medical record data and failed vacuum extraction. The data that has been collected is analysed to find the relationship between variables with the chi-square test

## RESULT

Samples were collected from patient data from August 2019 to March 2020 and obtained 26 patient data that met the inclusion and exclusion criteria from a total of 35 patient data because the other 9 patient data were incomplete.

**Table 1.** Frequency ditribution

Variable		frequency	%
Mother character			
Mother age	Risky	7	26,9
	Not risky	19	73,1
Parity	risky	6	23,1
	Not risky	20	76,9
Outcome			
Leceration perineum	3 <sup>rd</sup> & 4 <sup>th</sup> Degree	8	30,8
	1 <sup>st</sup> & 2 <sup>nd</sup> Degree	18	69,2
Asphyxia	Yes	4	15,4
	No	22	84,6

**Table 2.** Analysis of the relationship between maternal age and degree of perineum laceration after vacuum extraction

Mother age	Perineum laceration				Total		P value
	3 <sup>rd</sup> & 4 <sup>th</sup> Degree		1 <sup>st</sup> & 2 <sup>nd</sup> Degree		f	%	
	f	%	f	%			
Risky	5	62,5	2	11,1	19	73,1	= 0,014
Not Risky	3	37,5	16	88,9	7	26,9	
Total	18	100	8	100	26	100	

The results of statistical test obtained p value = 0.014 (P value less than 0.05). Thus it can be interpreted that there is a significant relationship between maternal age and the degree of perineum laceration after vacuum extraction at Dr. Kariadi Semarang.

**Table 3.** Analysis of the relationship between the amount of parity and the degree of perineum laceration after vacuum extraction

Parity	Perineum laceration				Total		P value
	3 <sup>rd</sup> & 4 <sup>th</sup> Degree		1 <sup>st</sup> & 2 <sup>nd</sup> Degree		f	%	
	f	%	f	%			
Risky	5	62,5	1	5,6	6	23,1	= 0,004
Not Risky	3	37,5	17	94,4	20	76,9	
Total	8	100	18	100	26	100	

The results of statistical tests using Chi-Square obtained p value = 0.004 (P value less than 0.05). Thus it can be interpreted that there is a significant relationship between the amount of parity and the degree of perineum laceration after vacuum extraction at Dr. Kariadi Semarang.

**Table 4.** Analysis of the relationship between maternal age and neonatal asphyxia after vacuum extraction

Moher age	asphyxia neonatorum				Total		P value
	Yes		No		f	%	
	f	%	f	%			
Risky	3	75,0	4	81,8	7	26,9	= 0,047
Not risky	1	25,0	18	18,2	19	73,1	
Total	4	100	22	100	26	100	

The results of statistical tests using Chi-Square obtained p value = 0.047 (P value less than 0.05). Thus it can be interpreted that there is a



significant relationship between maternal age and asphyxia neonatorum after vacuum extraction at Dr. Kariadi Semarang.

**Table 5.** Analysis of the relationship between the amount of parity and asphyxia neonatorum after vacuum extraction

Parity	asphyxia neonatorum				Total		P value
	Yes		No		f	%	
	f	%	f	%	f	%	
Risky	3	75,0	3	13,6	6	23,1	0,028
Not Risky	1	25,0	19	86,4	20	76,9	
Total	4	100	22	100	26	100	

The results of statistical tests using Chi - Square obtained p value = 0.028 (P value less than 0.05). Thus it can be interpreted that there is a significant relationship between the amount of maternal parity and neonatal asphyxia after vacuum extraction at Dr. Kariadi Semarang.

## DISCUSSION

### Relationship between maternal age and degree of perineum laceration after vacuum extraction

The results of this study indicate that there is a relationship between maternal age and the degree of perineum laceration after vacuum extraction with a  $p = 0.014$ . It was found that most mothers who experienced laceration degrees 1 and 2 were women who were not at risk (20-35 years) and mothers who had grade 3 and grade 4 lacerations were mothers at risk age (<20 years or 35 years). This study is in accordance with the results of previous studies conducted at dr. R. Goeteng 2019 found a relationship between the age of the mother and the degree of laceration with a p value of 0.034.<sup>17</sup> Another study in Sweden stated that mothers aged  $\geq 35$  years at all levels of parity had 2 times the risk of experiencing OASIS compared to women aged less than 25 years.<sup>11</sup>

This occurs because in mothers aged less than 20 years the strength of the perineum muscles and abdominal muscles have not worked optimally, so that often prolonged labor or jams that require action and increase the factor of perineum laceration. Whereas at the age of > 35 years a woman's reproductive function has decreased compared to normal reproductive function.<sup>12</sup> Difficulty in teenage pregnancies less than 20 years

or more than 35 years is 3 times more likely to experience difficult labor than during healthy reproductive periods of 20-35 years.<sup>15</sup>

### Relationship between parity and degree of perineum laceration after vacuum extraction

The results of this study indicate that there is a significant relationship between the amount of parity and the degree of maternal laceration after delivery with the aid of vacuum extraction with a value of  $p = 0.004$ . It was found that most of the mothers who experienced laceration degrees 1 and 2 were mothers with no risk parity (2 or 3) and mothers who experienced lacerations grade 3 and 4 were mothers with risk parity (1 or more than 3).

This research is in accordance with previous research at dr. R Goeteng Taroenadibrata Purbalingga, obtained a p-value of  $0.000 < \alpha 0.05$ , which means that there is a significant relationship between parity and the degree of laceration.<sup>17</sup> Another study conducted by Mariline Vale found that primiparous mothers had a significant relationship to the occurrence of lacerations grade 3 and 4 (22, 56.4%,  $P < 0.001$ ).<sup>13</sup>

This happens because multiparous mothers have a generally elastic perineum because they have already experienced stretching beforehand so that the risk of the perineum is small while primiparous mothers have a perineum elasticity which is still stiff. caused, while mothers with grande multiparous allow malpresentation and malposition of the fetus due to the condition of the uterus that has relaxed, causing weak uterine muscle contractions and will prolong labor time so that labor is indicated with assisted measures.<sup>12</sup> Parity has an influence on the incidence of perineum rupture, in mothers with One parity or mothers with primiparous have a greater risk of experiencing perineum tear than mothers with more than one parity. This is because the birth canal has never been traversed by the baby's head so that the perineum muscles are stretched. Perineum tears almost occur in all first deliveries (primiparous) and does not rule out the possibility of subsequent (multiparous) deliveries.<sup>3</sup>

### Relationship between maternal age and degree of neonatal asphyxia after vacuum extraction

From the results of the research analysis test, it was found that there was a significant relationship between maternal age and neonatal asphyxia with a value of  $p = 0.047$ . In the study, it was found that mothers with a risk age at the birth of



their babies after vacuum extraction experienced more neonatal asphyxia than mothers who were not at risk. The determination of asphyxia in this study is seen from the APGAR score. If the APGAR score shows  $<7$  then the baby is asphyxiated and if  $\geq 7$  then there is no asficion.<sup>14</sup>

This study is in line with previous research conducted at Goetheng Purbalingga Regional Hospital, it was found that there was a significant relationship between maternal age and the incidence of neonatal asficion with a p value = 0.047.9. Other studies at Dr. Saiful Anwar Malang also stated that there was a relationship between vacuum extraction and the incidence of neonatal asphyxia with a value (b = 1.00; 95% CI = 0.155 to 1.85; p <0.021).<sup>8</sup> Research conducted by Ritbano Ahmed at the Nigist Eleni Mohammed hospital was found that mothers who give birth aged  $\geq 35$  have a 6 times greater risk of developing neonatal asficion compared to mothers aged 20-34 years (AOR = 6.4; 95% CI = 2.0-20.5).<sup>6</sup> This proves that other than age factors that cause asficion neonatorum, vacuum extraction action factors also play a role.

This happens because pregnant women less than 20 years old can harm the health of the mother as well as the growth and development of the fetus because the reproductive organs are immature to get pregnant. Adolescent complication (less than 20 years) is higher than the healthy reproductive period between 20-30 years, thus facilitating the occurrence of neonatal asphyxia. Meanwhile, in mothers over 35 years of age, the health and function of their reproductive organs has begun to decline and other diseases that weaken the condition of the mother, thus disrupting the mother's blood circulation and increasing the factor of neonatal asficion.<sup>10</sup>

#### **Relationship between parity and the degree of neonatal asphyxia after vacuum extraction**

In this study, the results of the analysis of the correlation test between the amount of parity and the degree of neonatal asphyxia after vacuum extraction were obtained with a value of p = 0.028, which means that there is a significant relationship between parity and the incidence of neonatal asficion. This research is in line with the research conducted in the Melati room of Dr. Saiful Anwar Malang, who showed a significant relationship between the amount of parity and the incidence of neonatal asphyxia with p value <0.021.<sup>8</sup> Another study conducted at the Nigist Eleni Mohammed

hospital found that the mother Primiparous mothers were five times more likely to have babies with asphyxia than multiparous mothers.<sup>6</sup>

This can be due to the stiffness of the muscles or the stiff cervix when giving birth to the first child (primipara), which gives a much greater resistance while giving birth to the fifth or more child (grande multipara) there is a deterioration in the elasticity of the tissues that have been stretched repeatedly due to pregnancy. , so that the resulting contraction will also be less. These two conditions can prolong the labor process so that the flow of oxygen is reduced, so that it can cause the baby to be born to be asphyxiated.<sup>11</sup>

This study did not identify other factors, such as the indication for vacuum extraction and antenatal care, which may influence the occurrence of neonatal asphyxia and the high degree of perineal laceration. In addition, this study did not discuss other outcomes which are not less important such as the amount of bleeding, maternal infections and also the baby's body due to time limitation.

#### **CONCLUSION**

- There is a relationship between maternal age and parity with perineum laceration and neonatal asphyxia after vacuum extraction in Dr. Kariadi Semarang
- The incidence of grade 3 and 4 perineum lacerations and asphyxia of the neonatal is most common in women at risk of age more than 35 years and at risk parity, namely primiparous.

#### **Ethical Approval**

This research protocol has received ethical clearance from the Medical and Health Research Ethics Commission (KEPK), Faculty of Medicine, Diponegoro University / Dr. Kariadi Hospital, Semarang with letter number No. 193 / EC / KEPK / FK-UNDIP / VIII / 2020.

#### **Conflicts of Interest**

The authors declare no conflict of interest

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#### **Author Contributions**

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