ORIGINAL ARTICLE

The Association between Maternal Age and History of Cesarean Section with Antepartum Hemorrhage in Indonesia

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ABSTRACT

Background: 830 women die every day because of preventable causes related to pregnancy and childbirth. In developing countries, antepartum hemorrhage accounts for 16.3% of maternal deaths, while in Sub-Saharan Africa, the rate of bleeding reaches 24.5%. Maternal Mortality Rate (MMR) in Indonesia in 2012 achieved 359 per 100,000, and 90% was due to bleeding, infection, and preeclampsia. Various factors are associated with bleeding events in pregnancy; one is age and history of Caesarean section (SC).

Aim: This study aims to determine the relationship between maternal age and SC history with antepartum hemorrhage in Indonesia.

Method: This quantitative study with analytical surveys applied a case-control approach that analyzes the incidence of bleeding in pregnancy based Indonesian Demographic Health Survey (IDHS) in 2012 with a total of 15.173 respondents. Data analysis used chi-square with a p-value of 0.05 and CI 95%.

Results: The bivariate results obtained, maternal age was not associated with antepartum hemorrhage with a p-value (0.900), and the history of SC had a significant relationship with the incidence of antepartum hemorrhage (p-value = 0,000 <0.005).

Conclusion: Based on Health Technology Assessment (HTA) analysis, integrated antenatal care can be one of the policies to detect complications during pregnancy.

Keyword: Antepartum hemorrhage, maternal age, history of caesarian section, antenatal care

INTRODUCTION

Around 830 worldwide women die every day due to preventable causes related to pregnancy and childbirth; 99% of these deaths come from women in developing countries. Bleeding is the leading cause of maternal mortality worldwide, accounting for around 27% of deaths worldwide, including postpartum, intrapartum, and antepartum hemorrhage [1].

In developing countries, pre-natal bleeding accounts for 16.3% of maternal deaths, while in Sub-Saharan Africa, the rate of bleeding reaches 24.5%. Complications of antepartum bleeding can be in the form of a fetus or mother. Maternal complications include hypovolemic shock, disseminated intravascular coagulation, renal failure, high SC levels, placenta previa, peripartum hysterectomy, and postoperative anemia [2]. Various fetal complications are prematurity, low birth weight, intrauterine death, congenital malformations, and birth asphyxia [3].

The Maternal Mortality Rate (MMR) in Indonesia in 2012 reached 359 per 100,000 live births. Data reports from the Indonesian Ministry of Health regions show that the number of mothers who died of pregnancy and childbirth in 2013 was 5019 people. The direct cause of maternal mortality is obstetric complications (90%) known as classical trias, such as bleeding, infection, and preeclampsia [4].

In the maternal age group of 35-39 years, 33.0% contributed to antepartum hemorrhage, one of which was caused by placenta previa. Mothers who have a history of the previous cesarean section also have a significant relationship to antepartum hemorrhage occurrence [5].

One of the government's efforts to reduce maternal mortality is by providing pre-natal services, namely Antenatal Care (ANC), at least four times. The ANC service has a significant role, including making early detection and adherence to complications that can arise during labor[6].

The 2012 Indonesian Demographic Health Survey (IDHS) results show 8 percent and women experience bleeding in pregnancy [4]. Based on this background, the purpose of this study was to determine the relationship between age and history of SC with the incidence of antepartum Hemorrhage in Indonesia.

METHOD

This research applied quantitative research in the form of an analytic survey design. The research design used case-control with a retrospective approach.

This study included all women aged 15-49 years with the case group of mothers who experienced antepartum hemorrhage. The control group was mothers who did not experience antepartum hemorrhage in Indonesia based on data from the 2012 IDHS totaling 41,782 people. In this study, the inclusion criteria were respondents who had complete data on the questions related to the research variables. The exclusivity was respondents who did not know the answers. The sampling technique was taken with total sampling in the case sample, which meant that all women aged 15-49 years and having antepartum hemorrhage were excluded after 541 pieces. The control group sample was all women aged 15-49 years who did not experience bleeding events totaling 14,632.

Univariate analysis was carried out to determine the frequency distribution of respondent characteristics and each variable's percentage distribution. A bivariate analysis was performed to assess the interaction of two variables by chi-square statistical test with p-value <0.05. Also, to find out the magnitude of the risk in this study was done by calculating the odds ratio (OR).

RESULTS

Characteristics of respondents (Table 1) show that the majority of maternal age was not at risk, 11,366 (74.9%). For the education picture of respondents, respondents who completed formal education in high school and university were only 1957 (12.9%). The majority can also see the characteristics of respondents living in the rural, totaling 8233 (54.3%).

Also, the majority of respondents were multiparous, namely 9907 (65.3%). As for SC's history, most respondents did not have an account of previous SC with a case group of 419 (77.4%), and the control group numbered 12890 (88.1%).

The results of statistical tests between independent variables and the dependent variable (Table 2) showed that there were 134 respondents (24.8%) of risky age and 407 respondents (75.2%) of the age of respondents who were not at risk of developing antepartum hemorrhage with a p-value of 0.900. This shows no significant relationship between maternal age and the incidence of antepartum hemorrhage because the p-value is >0.005, and the CI range passes the number 1, is 0.834-1.224 (OR = 1.018).

Based on Table 2 shows that there were 419 respondents (77.4%) who did not have a history of previous SC and 122 respondents (22.6%) who experienced an antepartum hemorrhage with a p-value of 0,000 (OR = 2.155, CI = 1.750-2.652). This shows a significant relationship between the history of SC and the incidence of antepartum hemorrhage.

Table 1: Variable Frequency Distribution and Respondent Characteristics

No	Characteristics	Group				N (Total)	%
		Case		Control			
		F	%	F	%		
1	Maternal age						
	Not Risk	407	75.2	1059	74.9	11366	74.9
	Risk	134	24.8	3673	25.1	3807	25.1
2	Education						
	High	90	16.6	1867	12.8	1957	12.9
	Low	451	83.4	12765	87.2	13216	87.1
3	Residence						
	Urban	301	55.6	6639	45.4	6940	45.7
	Rural	240	44.4	7993	54.6	8233	54.3
4	Parity						
	Primiparous	189	34.9	5077	34.7	5266	34.7
	Multiparous	352	65.1	9555	65.3	9907	65.3
5	History of SC						
	Not SC	419	77.4	12890	88.1	13309	87.7
	SC	122	22.6	1742	11.9	1864	12.3

Table 2 Relationship of Maternal Age and SC History with Occurrence of Antepartum Hemorrhage

Variable Independent	Antepartum Hemorrhage		Not Antepartum Hemorrhage		OR	95 % CI	*P-value*
	n = 540	%	n = 14632	%			
Maternal Age							
No-Risk	407	75.2	10959	74.9	1,018	0,834-1,242	0,900
Risk	134	24.8	3673	25.1			
History of SC							
Not SC	419	77.4	12890	88.1	2,155	1,750-2,652	0,000
SC	122	22.6	1742	11.9			

DISCUSSION

Antepartum hemorrhage is defined as bleeding into or from the vaginal canal from the 24th week of pregnancy to the second stage of labor. Antepartum hemorrhage is a significant cause of maternal and perinatal morbidity and mortality, and even one of the reasons is almost dead in the mother. The leading causes of antepartum are placenta previa, placental abruption, and uterine rupture. However, maternal characteristics such as age and SC history are often associated with risk factors for antepartum bleeding [7].

Relationship of maternal age with the occurrence of antepartum hemorrhage: In this study, it was found that maternal age did not have a statistically significant relationship with antepartum hemorrhage incidence. This can be seen from the p-value of 0.920 <0.005 (OR = 1.015; CI = 0.832-1.239). The absence of an association between age risk factors and the incidence of antepartum hemorrhage is associated with the proper management of women as high-risk groups that require increased care with strict follow-up [8].

Also, antepartum hemorrhage occurs because it is not entirely caused by age, but other factors such as placental abruption associated with preeclampsia and other complications and smoking or previous labor history. It is known that age and multiparity are strongly associated with abnormal invasive placental abruption and placenta along with various other conditions of morbidity during pregnancy and childbirth. So that in this study, maybe age does not affect antepartum bleeding but affects placental abruption and abnormal placenta [9].

This study is not in line with previous studies, namely Takai in the 2015 survey, which showed that maternal age is at risk of being associated with antepartum hemorrhage

due to chronic medical conditions related to age such as hypertension [10]. According to the theory, this result states that age 20-35 years is an age that is considered a risk during pregnancy. Pregnancy at the age of fewer than 20 years of pelvis and uterus is still small, and the reproductive devices are immature. While at the age of 35, the maturity of the reproductive organs has decreased, which can lead to health problems at the time of delivery and the risk of antepartum bleeding [11].

Also, the relationship between age and placenta previa is more common in older and multiparous women. The reason is related to the aging of the uterine blood vessels, which causes placental hypertrophy and enlargement, which increases the likelihood of the placenta entering the lower uterine segment [11].

Relationship between SC history and the incidence of antepartum hemorrhage: In this study, it was found that the history of SC was associated with the incidence of antepartum hemorrhage, p-value = 0,000 (OR = 2,155, CI = 1,750-2,652). This result means that the history of SC 2,155 times affects the incidence of antepartum hemorrhage. This is in line with the results of a systematic review and meta-analysis conducted that cesarean section surgery has a greater risk of bleeding and hysterectomy [12].

This is in line with research conducted in the UK in 2011 showing that the level of placenta previa in women with a history of SC was 8.7 times more at risk than women who had a history of vaginal delivery (OR = 1.88). This result is consistent with recent research from other countries that usually find odds ratios ranging from 1.4 to 1.7. The incidence of placenta previa is 3-5 per 1000 pregnancies worldwide and is still increasing due to increased cesarean section rates. This incidence is much higher at twenty weeks compared to 36 weeks and above. As pregnancy progresses, the lower uterine segment is formed, the upper detail enlarges and moves with the placenta [12].

A study conducted in Uganda stated an association between SC delivery history and the incidence of antepartum hemorrhage with OR 4.5; CI = 95%, 13.5-149.5). This is attributed to the theory that damage and scarring in the uterus during SC surgery is a low predisposition to placental implantation. Scars in the uterus can also inhibit the lower uterine segment's physiological development, thereby disrupting the placenta's migration during pregnancy [13].

Based on the systematic review results and metathesis in 2018, placenta previa in the second pregnancy with vaginal delivery at first pregnancy was 4.4 per 1000 births, while the cesarean section was 8.8 per 1000 births. Other data mentions mothers with a history of the one-time cesarean section have a 2.2 times greater risk of developing placenta previa. The risk increases along with the rise in cesarean section history, which is 4.1 times for two cesarean sections and 22.4 times for a three times cesarean section [14].

In addition to the research conducted in Brazil in 2014, the relationship between previous cesarean sections was also associated with bleeding. This is possible because of the association between the last uterine scars, which increases the risk of abnormal placentation and the appearance of uterine rupture, resulting in pregnancy loss [9].

In women with a history of cesarean section, a poor condition of the endometrium due to cesarean section injury causes the placenta to grow to become broad to meet the fetus's needs. This causes the placenta to cover the internal uterine ostium, which can cause antepartum hemorrhage. Also, uterine defects, such as cesarean section, scraping, and myomectomy, play a role in the inflammatory process and the incidence of endometrial atrophy, resulting in insufficient vascularization of decidua causing placenta previa [14].

CONCLUSION

Characteristics of respondents who are always associated with antepartum hemorrhage. However, in this study, maternal age is not one of the risk factors for antepartum hemorrhage. Otherwise, SC history has a significant relationship to the occurrence of antepartum hemorrhage. Based on the above studies results, the health technology assessment conducted by the need for integrated antenatal care, which is a continuous effort, refers to WHO, which consists of 4 visits for low-risk pregnancies without complications. This is the right action to recognize early abnormalities or complications that might occur during pregnancy, such as bleeding during pregnancy including general medical history, preparing for a month of labor, giving birth safely, both mother and baby with minimal trauma, preparing the mother so that the puerperium runs typically and prepares the role of mothers and families in accepting baby's health so that they can grow and develop optimally.

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