

The Correlation Between Parity and Premature Rupture of Membrane (PROM) Incidence

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ABSTRACT

Aim: This research aims to identify the correlation between parity and premature rupture of membrane (PROM) incidence at KIA Sadewa Hospital in 2013.

Methods: The research was observational analytic research with a cross-sectional design. The sampling employed total sampling. This research population was all women giving birth at KIA Sadewa Hospital from January to December 2013 who had complete data as many as 2,645 women. The samples used in this study were 2388 women with expected delivery and 257 women who experienced the PROM. The data were secondary data obtained from medical records and then analyzed in univariate and bivariate analysis using a chi-square test with $p\text{-value} = 0.005$.

Results: Women giving birth at KIA Sadewa Hospital in 2013 were mostly *multipara*. The incidence of premature rupture of membrane at KIA Sadewa Hospital in 2013 indicated 9.7% of them experiencing the PROM and 90.3% not experiencing the PROM.

Conclusion. There was a correlation between parity and the incidence of premature rupture of membrane at KIA Sadewa Hospital in 2013. There is a correlation between parity with the incidence of premature rupture of membrane at KIA Sadewa Hospital in 2013.

Keywords: Parity, Premature Rupture of Membrane

INTRODUCTION

Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) are important indicators used in determining public health status because MMR and IMR show their ability and quality in health services. MMR describes the number of women who die from a cause of death related to pregnancy disorders or treatment (not including accident or incidental causes) during pregnancy, childbirth, and in the puerperium (42 days after delivery) without taking into account the length of pregnancy per 100,000 live births. IMR is the number of people who die before reaching one year, stated in 1,000 live births in the same year. The age of a baby is a condition that is susceptible to both pain and death [1]. *The World Health Organization* (WHO) estimates maternal deaths occur in more than 500,000 cases per year worldwide, resulting in the reproductive process [2]. Most maternal deaths in the world occur in developing countries, including in Indonesia [3]. Based on 2012 Indonesian Demographic and Health Survey (IDHS), the average MMR in Indonesia was recorded at 359 per 100,000 live births. The average maternal mortality rate skyrocketed compared to the 2007 IDHS, which reached 228 per 100 thousand [4]. In 2012 in the Province of DIY, following the District/City Health Office's reporting, the number of maternal deaths decreased by 40 cases, so that when calculated to be AKI reported at 87.3 per 100,000 live births. The MDG target in 2015 for national AKI is 102/100bb of live births, and for DIY, it is relatively close to the target, but it still requires hard and consistent efforts from all parties involved. In 2012, the highest MMR was Sleman Regency as many as 12 per 1000 live births, Gunung Kidul as many as 11 per 1000 live births, Bantul and Yogyakarta as many as 7 per 1000 live births, and Kulon Progo as many as 3 per 1000 live births [5]. The cause of maternal death in Indonesia is still dominated by Bleeding (32%) and Hypertension in

Pregnancy (25%), followed by infection (5%), prolonged labor (5%), and abortion (1%). In addition to obstetric causes, maternal mortality is also caused by other causes (non-obstetric) by 32%. While maternal deaths in DIY are the leading causes are sepsis, bleeding, and eclampsia [6]. The risk of infection in the mother and baby increases in the incidence of premature rupture of membranes. Premature rupture of membranes (PROM) is one of the fundamental problems of the largest cause of preterm labor. CPD can also cause infection in mothers and babies, increasing maternal and neonatal morbidity and mortality [7].

Many factors can cause PROM, both from the mother and the fetus. These factors include infection, incompetent cervix, excessive intrauterine pressure, sexual trauma, localized abnormalities, socioeconomic conditions, blood type, disproportion, *multigravida*, smoking, antepartum hemorrhage, and iron deficiency [8]. According to (Cunningham 2006), mothers who have given birth several times are more at risk of developing PROM because vascularity in the uterus is impaired, which results in brittle membrane connective tissue and eventually spontaneous rupture [9]. In the research conducted by Al Riyami, the maternal complications observed in this study included; infection, which was seen in 20 (45%) patients; antepartum hemorrhage in 11 (25%) patients; and cesarean section, which was required in 12 (27%) patients. There was no significant association between risk factors such as gestational age at delivery, parity, maternal age at PPRM, maternal Body Mass Index (BMI), and cesarean section rate [10]. From the data obtained in 2012, the highest MMR in Yogyakarta is in the Sleman regency. One of the most PROM data is in Sleman District Hospital in 2012, 475 patients with PROM cases or equal to 17.89% of the total deliveries [11].

The results of the preliminary study on February 28, 2014, at Sadewa Hospital, obtained medical record data in 2012, from January to December 2012, of the total number of clients hospitalized as many as 2475 mothers, there were 456 (18.42%) clients experiencing PROM, for parity data can not be obtained. Researchers are interested in researching Sadewa Hospital because Sadewa Hospital is a Maternal. Child Special Hospital has a maternity patient every month with cases of premature rupture of membranes. Researchers want to do research in Sadewa Hospital because the number of mothers experiencing PROM is not much different from the number of PROM cases in Sleman District Hospital. Hence, the researchers want to know the causes of the many incidents of PROM in Sadewa Hospital. Based on the data above, the researchers are interested in researching parity's relationship with the incidence of premature rupture of membranes in Sadewa Hospital. This research aims to identify the correlation between parity and premature rupture of membrane (PROM) incidence at RSKIA Sadewa in 2013.

METHOD

The type of research used in this study was a descriptive-analytic study. The study was conducted using a cross-sectional approach. The location of the study was conducted at Sadewa Hospital. Time The study will be conducted on July 14, 2014. The population in this study were all mothers giving birth in Sadewa Hospital from January to December 2013, which had complete data with 2645 people. The samples used in this study were 2388 normal maternity mothers and 257 maternity mothers with PROM. The sampling technique used in this study is a total sampling. The research variables are divided into two variables, the independent variable in this study is parity. The dependent variable in this study is the incidence of premature rupture of membranes. The tool used for data collection in this study uses a master table with columns or lanes containing numbers, medical record numbers, respondents' names, PROM, not PROM, and parity. This study has two data analyses: univariate analysis and bivariate analysis, with the *chi-square* (χ^2).

Table 3. The correlation between parity and the Disorder of Early Rupture in RSKIA Sadewa in 2013.

PROM events	Paritas								Total		p value
	Grande Multiparous		Multiparous		Primiparous		Nulliparous				
	f	%	F	%	f	%	F	%	F	%	
PROM	27	1.0	70	2.6	87	3.3	73	2.8	257	9.7	0.001
Non PROM	430	16.3	755	28.5	635	24.0	568	21.5	2388	90.3	
	457	17.3	825	31.2	722	27.3	641	24.2	2645	100	

RESULTS

Data Analysis: Table 1 shows the parity of mothers giving birth at RSKIA Sadewa in 2013. Most respondents had multipara parity of 825 respondents (31.2%), and a small proportion of respondents had grand multipara parity as many as 457 respondents (17.3%).

Table 1. Frequency distribution of parity in maternity in KIA Sadewa Hospital in 2013.

Parity	f	(%)
Grandemultipara	457	17.3
Multipara	825	31.2
Primipara	722	27.3
Nullipara	641	24.2
Total	2645	100.0

Frequency Distribution of premature rupture of membranes incidence in RSKIA Sadewa in 2013 is shown in Table 2, 257 maternity mothers experienced PROM (9.7%) and non-PROM many as 2388 respondents (90.3%).

Table 2. Frequency distribution of premature rupture of membranes incidence in KIA Sadewa Hospital in 2013.

PROM events	F	%
PROM	257	9.7
Non PROM	2388	90.3

The correlation between parity and premature rupture of membranes incidence in KIA Sadewa Hospital is shown in Table 3. PROM events occurred in primipara parity as many as 87 respondents (3.3%), and those who did not

experience PROM occurred in multipara parity were as many as 755 respondents (28.5%). The results of the Chi-Square (χ^2) statistical test obtained p-value = 0.001. Thus, it can be seen that the value of 0.001 < 0.05 indicating that There was a correlation between parity and the incidence of premature rupture of membranes in KIA Sadewa Hospital.

DISCUSSION

Parity of mothers giving birth to PROM at KIA Sadewa Hospital in 2013: The study results showed that most respondents had a multipara parity of 825 respondents (31.2 %). The second and third parity were relatively safer conditions for pregnancy and childbirth in the reproductive period. In these circumstances, the uterine wall had not changed much, and the cervix has not experienced too often the opening so that it can support the membranes properly [12]. Mothers who have given birth several times more at risk of experiencing PROM because vascularity in the uterus has a disruption that results in brittle membrane connective tissue is fragile and eventually spontaneous rupture [13]. This study's results are in line with Ferguson's research, with the title "Preterm premature rupture of membranes: nutritional and socioeconomic factors," which states that PROM incidence mostly occurs in mothers with primipara and multipara parity [14]. The study results showed that a small percentage of respondents had grand multipara parity as many as 457 respondents (17.3 %). The cause of premature rupture of membranes was multigravida because the cervical [15] was in the

multigravida. The canal is always open because of giving birth more than one time [15].

The incidence of premature rupture of membranes in KIA Sadewa Hospital in 2013: The research data showed that the mothers who experienced PROM were 257 respondents (9.7%), and those who did not experience PROM were 2388 respondents (90.3%). According to Mercer, the causes of PROM are multiparity, hydramnios, localized abnormalities (breech or latitude), spinopelvic disproportion, multiple pregnancies, pendular abdomen (abdominal hanging) [16]. According to Harger, in another research entitled "Understanding the Health of Female Reproduction," the cause of rupture of membranes (fetal membranes) are direct trauma to the mother's abdomen abnormalities in the location of the fetus in the uterus and grand multipara pregnancy or pregnancy more than five times [17].

The cause of PROM, according to Singh, is multipara [18]. Multipara is more likely to have an infection because the cervical opening process is faster than nullipara, so there can be a premature rupture of membranes. In the case of infection, it can cause a biomechanical process in the membranes' proteolytic form to facilitate membranes' rupture. In multipara, because of a history of labor, the connective tissue condition is looser than nullipara. In multipara connective tissue that supports the amniotic membrane decreases, multipara is more at risk of premature rupture of membranes than nullipara [19]. Consistency of the cervix in labor dramatically affects the occurrence of premature rupture of membranes. In multipara with thin cervical consistency, the likelihood of premature rupture of membranes is more significant in the presence of intrauterine pressure at the time of delivery. The consistency of a thin cervix with the cervix's opening in a multipara (flattening while opening almost at once) can speed up the cervix's opening so that the risk of amniotic rupture before complete opening [16]. This study's results are in line with the research conducted by (Raya, 2010) stating that the incidence of premature rupture of membranes in Santo Yusuf hospital was 450 respondents out of a total of 900 respondents [20].

The correlation between parity and the incidence of premature rupture of membranes in RSKIA Sadewa in 2013: The research results showed that most PROM incidences occurred in primipara as many as 87 respondents (3.3 %), and those who did not experience PROM occurred in multipara were as many as 755 respondents (28.5 %). *Chi-Square (χ^2)* statistical test obtained *p-value* = 0.001 so that it can be seen that the value of 0.001 < 0.05. It can be concluded that there was a correlation between parity and the incidence of premature rupture of membranes in RSKIA Sadewal.

Primipara mothers should not be susceptible to premature rupture of membranes because the mother had never been pregnant or had a previous uterine stretching. Besides, primipara connective tissue maternity and vascularity were still healthy. Primiparous mothers who experience premature rupture of membranes are associated with psychological conditions, including pain during pregnancy, physiological disorders such as emotions, and anxiety for pregnancy [21]. Mothers who

experience anxiety and emotions during pregnancy will interfere with the mother's condition because the adrenal gland will produce the hormone cortisol. Thus when the mother experiences anxiety, the brain called the amygdala sends a signal to the hypothalamus. The hypothalamus produces the hormone CRH associated with ACTH (Adrenocorticotrophic). ACTH sends a signal to the adrenal gland to release cortisol. However, if excess cortisol production will suppress the immune system, so the mother may be susceptible to infection/inflammation, which can cause increased activity of iL-1 and prostaglandin, produce tissue collagenase, resulting in collagen depolymerization in the chorion / amniotic membrane, thin membranes, weak and easily break spontaneously, causing premature rupture of membranes [22].

In multipara mothers, they should not be susceptible to experiencing premature rupture of membranes because the cervix's strength is still good. The average multipara mothers are the women aged 20-35 who still have suitable reproductive organs for pregnancy and childbirth. There are still many multipara mothers who experience premature rupture of membranes. This can occur because the multiparous mothers will affect the embryogenesis process so that the formed membranes will be thinner, which will cause rupture of membranes [23]. Grandmultipara mothers are indeed vulnerable to the incidence of premature rupture of membranes. Many mothers who experience premature rupture of membranes are mostly mothers aged > 35 years. This is because the mother has already been pregnant or the uterus has been enlarged before so that if the pregnant woman returns, her uterus will stretch. The strength of connective tissue and vascularization is reduced to cause the inferior becoming fragile in certain areas [24]. According to Silverman's opinion, one of the risk factors associated with the onset of premature rupture of membranes is parity [25]. Lee's theory also reinforces this opinion that parity allows damage to the cervix during previous delivery [26]. : premature rupture of membranes will increase in mothers with grand multipara. In this theory, the amniotic membrane is not healthy due to the lack of connective tissue and vascularization, which causes the tire to rupture early [27]. Primipara mothers who did not experience premature rupture of membranes are indeed not susceptible to the incidence of premature rupture of membranes. There are still many primipara mothers who do not experience premature rupture of membranes. This is in line with the theory of Serenius that primiparous mothers have never given birth so that they have not experienced stretching or enlargement of the uterus, and cervical damage has not occurred, as well as healthy connective tissue and vascularization [28].

Multiparous mothers do not experience PROM. It is because multiparous mothers are not vulnerable to the incidence of premature rupture of membranes. There are still many multipara mothers who do not experience premature rupture of membranes. This may be influenced by the mother's cervix's condition, who is still competent. If the mother's cervix is incompetent, it will predispose to premature rupture of membranes. This is consistent with the theory stated by Zarei that one of the factors predisposing to premature rupture of membranes is the incompetent cervix [29]. In grande multipara mothers who

do not experience premature rupture of membranes, grand multipara should be susceptible to the incidence of premature rupture of membranes. There are still many mothers who do not experience premature rupture of membranes. Many other things may influence this situation because it is not known with certainty for the cause of the amniotic rupture. Besides, mothers may not experience other predisposing factors, namely: a history of previous premature rupture of membranes, abnormalities of location, incompetent cervix. The results of this study are in line with the research conducted by [30] with the title of the relationship of maternal age, occupation, and parity to the incidence of premature rupture of membranes, which states that there is a significant relationship between parity and the incidence of premature rupture of membranes with *chi-square* formula and obtained *p-value* of 0.004.

CONCLUSION

Mothers in RSKIA Sadewa in 2013 mainly were multipara. Mothers in RSKIA SADEWA in 2013 did not experience PROM. There is a relationship between parity with the incidence of premature rupture of membranes in RSKIA Sadewa in 2013 with *a value* = 0.001. The need to pay attention to the documentation's completeness in medical records so that the data source's reliability and validity can be measured and the incomplete medical record data and lousy writing in medical records. Further research is needed and develop this title by connecting to other variables so that the results obtained will be more comprehensive.

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