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Prevalence premature rupture of membranes in pregnant women with a history of anemia

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ABSTRACT

Premature rupture of membranes is one of many obstetric problems that is dangerous for a mother in maternity. It is one of the top five reasons behind child mortality in the world and also one of the cause of premature labor. Premature rupture of membranes could be caused by anemia through many pathological mechanism. This research was conducted to determine the prevalence of premature rupture of membranes in pregnancy of anemic mothers in RSUD Kota Tangerang on 2018 – 2020. This research is descriptive research with cross-sectional design. Data retrieval was carried out in RSUD Kota Tangerang throughout January – May 2022 with medical records instrument. Samples were retrieved using non-random sampling method. Based on the research results, a total of 75 samples of pregnant women with anemia was collected. The result showed a total of 38 samples (50.7%) pregnant women with anemia experienced premature rupture of membrane. In addition, as many as 37 samples (49.3%) of pregnant women with a history of anemia who did not experience premature rupture of membranes. It can be concluded the prevalence of premature rupture of membranes in pregnant anemic woman is more than those who did not experience premature rupture of membranes in RSUD Kota Tangerang.

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INTRODUCTION

One of the problems in the field of obstetrics is premature rupture of membranes (PROM). Perinatal morbidity and mortality can increase in PROM case. Anemia is one of the causes of KPD (Wahyuni, 2019). Based on the World Health Organization (WHO) in 2011, anemia can occur if the hemoglobin level in the blood is below normal values. The component of erythrocytes which is useful for binding O_2 and distributing it to all body tissues is called Hemoglobin. If the hemoglobin level is <11 gr/dl in the first and third trimesters or <10.5 gr/dl in the second trimester, then the pregnant woman can be said to be anemic, this can be caused by hemodilution.

According to data from *Riskesdas* 2018, the number of pregnant women with a history of anemia increased by 11% in 2013, that was 37.1%, then to 48.9% in 2018, which means that almost

half of the population of pregnant women in Indonesia has a history of anemia. Furthermore, based on age, mothers who gave birth with the most history of anemia were during their productive age, that was 15-24 years (Tim Riskesdas, 2019). In the world, the average prevalence of anemia in pregnant women is around 42%. Meanwhile, in developing countries, the prevalence is 43% and in developed countries is 9%.

In pregnancy, the impact of anemia is the occurrence of premature labor, abortion, obstacles to the growth, and development of the fetus, the threat of cardiac decompensation (Hb <6 gr/dL), hydatidiform mole (molar pregnancy), hyperemesis gravidarum, antepartum bleeding (bleeding during pregnancy), and KPD. In the fetus, metabolism in the body can be reduced with anemia so that it can interfere with ongoing growth and development in the fetus. It can also experience problems in the form of abortion, intrauterine death, high-term delivery, low birth weight, birth with anemia, congenital defects, babies easily infected until perinatal death, and low intelligence (Manuaba, 2010). Besides, lack of intake of iron, folic acid, and vitamin B12 causes anemia in pregnant women (TALSON, 1949).

RESEARCH METHOD

This research is a descriptive study with a cross-sectional design. This aims to determine the prevalence of premature rupture of membranes in pregnant women with a history of anemia at RSUD Kota Tangerang in 2018 - 2020. This research was conducted at RSUD Kota Tangerang in January - May 2022 with the research subjects were pregnant women who met the criteria, such as pregnant women with full-term pregnancies and singleton pregnancies, and also were listed in the medical records at the RSUD Kota Tangerang started from 1 January 2018 – 31 December 2020. Data collection was carried out using the medical records of RSUD Kota Tangerang. The data were processed using the Microsoft Excel program and presented in the form of tables and graphs.

RESULTS AND DISCUSSIONS

The data were obtained from January to May 2022. Sampling in this study had met the predetermined sample size of 74 samples. Then, the number of samples obtained were 75 samples of pregnant women with an anemia history from the medical records of RSUD Kota Tangerang. This study found that the age of the research sample was in the range of 18 years to 41 years. This can refer to the 2017 Indonesian Demographic and Health Survey (SKDI) data that the first age for Indonesian women to marry is 15-49 years (72%), and the survey also stated that the age of menopausal women in Indonesia was mostly in the range of 48-49 years (43%). The reproductive age of Indonesian women is around 20 years and over ((BPS), 2013).

Table 1. Characteristics of Research Sample

Characteristics	KPD N (%)	Non-KPD N (%)	Mean (Min;Max)
Mother's Age (years)			27,91 (15;41)
15 – 25	21 (55,3%)	11 (29,7%)	
26 – 35	14 (36,8%)	15 (40,6%)	
>35	3 (7,9%)	11 (29,7%)	
Education			-
No school	1 (2,6%)	-	

Elementary	5 (13,2%)	3 (8,1%)	
School	6 (15,8%)	6 (16,2%)	
Junior High	22 (57,9%)	23 (62,2%)	
School	4 (10,5%)	2 (5,4%)	
Senior High	-	3(8,1%)	
School			-
D3	12 (31,6%)	13 (35,1%)	
S1 (Bachelor Degree)	26 (68,4%)	24 (64,9%)	
Job status			38,57 (37;42)
Working	18 (47,4%)	19 (51,3%)	
Doesn't work	17 (44,7%)	17 (46%)	
Gestational	3 (7,9%)	1 (2,7%)	
Age(weeks) 37 – 38			2,23 (1;6)
39 – 40	31 (81,6%)	17 (46%)	
≥ 41	4 (10,5%)	16 (43,2%)	
Paritas	3 (7,9%)	4 (10,8%)	
1 – 2			8,99
3 – 4	14 (36,8%)	7 (19%)	(4,9;10,9)
≥ 5	22 (57,9%)	26 (70,2%)	
Degree of Anemia	2 (5,3%)	4 (10,8%)	
Mild (Hb 10–10.9)			
Moderate (Hb 7–9.9)			
Weight (Hb < 7)			

According to the Table 1, the most current education in the sample was junior high school as many as 45 samples (60%). Based on data from the Indonesian Ministry of Education and Culture for 2019/2020, the last education of women in Indonesia with the highest proportion is elementary school (12,054,104 people) when compared to women whose last education was junior high school (4,918,824 people) and high school/vocational school (2,480,729 people). There is a decrease in the frequency of the number of women based on the level of educational degree. This can be caused by the large number of women in Indonesia who drop out of school and the culture influence of early-age marriage in Indonesia (BPS, 2021).

The most common type of work in the research sample was housewives with 50 samples (66.7%). This research was supported by the Indonesian Women's Profile Journal 2021 by the Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia. The culture in Indonesia assumes that men are the backbone of the family or the main source of breadwinners so that women are more responsible for managing the household.

The largest sample of pregnant women's gestational age was found in the 37-38 week gestation group with 37 samples (49.3%). The results of this study was supported by the research conducted by Fanny, Adriani (2017) at the Tambak Wedi Public Health Center in Surabaya on 350 gave birth mothers showed that the largest distribution was the sample gestational age group at the age of 38-42 weeks (68.33%). It can be said that most pregnant women give birth at term or in the third trimester (Denna Rahinda Yulia Fanni & Merryana Adriani, 2017).

In this research sample, there were 48 samples (64%) of pregnant women who had 1-2 children. Parity data in this study was supported by the Indonesian Population Journal conducted by Arsyad, Nurhayati (2016) and published by the National Population and Family Planning Agency (*BKKBN*). 45% of women have 1-2 children, 21% have 3-4 children, and 7% have more than 5 children (Arsyad, 2016).

The 75 research samples of all pregnant women experienced anemia where the hemoglobin level in pregnant women was <11 g/dL. Pregnant women tend to experience anemia because the

physiological needs of pregnant women increased. In addition, anemia in pregnant women must be prevented properly so that it did not cause complications, such as premature rupture of membranes (Sikoway et al., 2020). The average hemoglobin level obtained was 8.99 g/dL with the highest percentage of moderate anemia by 48 samples (64%). Then, moderate degree of anemia has hemoglobin levels ranging from 7 g/dL – 9.9 g/dL. Insufficient iron intake can be a factor in the occurrence of anemia in pregnancy. This could be prevented by giving iron (Fe) tablets. In a study at the Purwoyoso Public Health Center in Semarang conducted by Litasari, Sartono, Mufnaetty (2014) in 21 samples, it was found that there was a significant relationship between adherence to consuming iron tablets and increased hemoglobin levels in pregnant women (Litasari, D., Sartono, 2014).

Based on the results of the study, it was obtained a characteristic description of the 38 samples, the most anemic pregnant women with premature rupture of membranes was 15-25 years, consisted of 21 people (55.3%). This research was supported by research conducted by Demiarti & Suharni in 2017 which stated that KPD occurs in pregnant women aged < 20 years and > 35 years (Demiarti, 2017).

The last education of the most respondents was high school level with 22 people (57.9%). This was supported by research conducted by Alim in 2015 which stated that 46% of mothers with KPD had high school education (Safitri, 2916). The employment status obtained by most respondents was not working as many as 26 people (68.4%). This research was supported by research conducted by Panjaitan & Tarigan in 2018 at Martha Friska Hospital which found that pregnant women who experience KPD as housewives showed the highest data at 71.1% (Panjaitan & Tarigan, 2018).

The highest gestational age in respondents was 37-38 weeks in 18 people (47.4%). This is in line with Prawirohardjo's theory in 2010 which said that in pregnancies ≥ 37 weeks or term, as many as 8-10% of pregnant women will experience KPD, and in pregnancies < 37 weeks, there are as many as 1% of KPD cases (Tri Astuti et al., 2014). Premature rupture of membranes occurs may be more happened at term or ≥ 37 weeks than < 36 weeks (Manuaba, 2010). The number of parity in the highest respondents was 1-2 children in 31 people (81.6%). The results of this study are in line with a study conducted by Sepduwiana in 2013 which stated that the most occurrence of KPD in mothers who gave birth was in primiparas as many as 45 people (48.9%) (Oxorn dan Forte, 2010). In addition, this research was also supported by research conducted by Legawati and Riyanti in 2018 which stated that 81.9% of KPD occurs in primiparous women (Legawati & Riyanti, 2018). KPD in primiparous women is mostly caused by the first pregnancy which is the most severe test on women's reproductive abilities (Nugroho, 2011).

The degree of anemia in this results found that anemia was on the moderate type (Hb 7 – 9.9%) in 22 people (57.9%). Anemia can cause hypoxia in the tissue, particularly the amniotic tissue. Hypoxia will induce maternal stress which will trigger CRH secretion by the HPA (pituitary-hypothalamic axis) (Hutter et al., 2010). CRH will be secreted by a specific nervous system called the paraventricular nucleus. Then, CRH will stimulate the hypothalamus to release ACTH (adenocorticotropin hormone) which will circulate in the blood and bind to its receptors in the adrenal cortex. Then, cortisol will be released by the adrenal cortex (Nath et al., 2017). Cortisol has a catabolic effect in the body on fat tissue, glycogen, and protein. Cortisol can also induce collagenolysis of the membrane membranes which can cause the membranes to thin out. A decrease in collagen and other proteins in the membrane can trigger premature rupture of membranes (Sherwood, 2016). (Table 1)

In this study, 75 respondents and 38 samples (50.7%) of pregnant women experienced premature rupture of membranes (PROM) at term. In a study at the Balaraja Hospital in Tangerang by Setyaningsih (2019), there were 396 mothers who gave birth, 178 samples (44.9%) of whom had premature rupture of membranes (Setyaningsih, 2019). In another study which located at the Gatot Soebroto Army Hospital by Muni, Riana (2019), there were 53 people 71.7%) of pregnant women aged 21-35 years experienced premature rupture of membranes (R, 2019). The results of both studies

support that a large proportion of the give birth mother's population experienced premature rupture of membranes (Fujiyarti et al., 2015). It was also found in a study conducted by Chu, *et al.* (2020) on 32.234 pregnant women at Taipei Chang Gung Memorial Hospital for the period 2011 – 2016 stated that the risk of premature rupture of membranes in pregnant women was increased by anemia (Chu et al., 2020).

CONCLUSION

The prevalence of premature rupture of membranes in pregnant women with a medical records of anemia concluded that out of 75 research samples, 38 samples (50.7%) had premature rupture of membranes and 37 samples (49.3%) did not experience premature rupture of membranes during term pregnancy. In addition, from these 38 research samples of anemic pregnant women with premature rupture of membranes, it was found that the highest maternal age ranged from 15-25 years as many as 21 people (55.3%), the last education in the sample mostly was high school as many as 22 people (57.9%). Besides, the most employment status was 'not working' as many as 26 people (68.4%), the gestational age in the most sample was 37-38 weeks as many as 18 people (47.4%), while the parity in the most sample was 1-2 children of 31 people (81.6%). Moreover, the highest degree of anemia in the sample, namely moderate type anemia as many as 22 people (57.9%). It is recommended to carry out an Ante Natal Care examination (routine pregnancy control) to help pregnant women screen during their pregnancy so that anemia problems can be treated early. Then, there is more concern about blood hemoglobin levels in pregnant women for consuming Fe tablets can be an option to treat anemia in pregnant women. It's better to take Fe tablets when they want to plan a pregnancy. It can also be suggested to health workers or related agencies to provide good Ante Natal Care services and also provide education to pregnant women or married couples who are planning a pregnancy about the importance of taking Fe tablets in order to prevent anemia earlier and premature rupture of membranes during labour.

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