

OLD RELATIONSHIP OF INCIDENTS OF EARLY BREAKING WITH LEUKOCYTE RATES IN MATERNITY MOTHERS IN KARUNIA KASIH HOSPITAL BEKASI IN 2022

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Abstract

Background: The results of Long Form SP 2020 show that Indonesia has a maternal mortality rate of 189 which means that 189 women die during pregnancy, childbirth, or postpartum per 100,000 live births. maternal mortality rate in Indonesia has decreased. One of the causes of maternal death in Indonesia is due to infectious factors that cause KPD as much as (12%) (Ministry of Health of the Republic of Indonesia, 2020). **Research Objective:** The general purpose of this study is to determine the relationship between the length of premature rupture of membranes with leukocyte levels in maternity mothers at the Bekasi Gift of Love Hospital in 2022. **Research Methodology:** The methodology used in this study used a type of analytical observational research with a *cross-sectional* research design, the number of populations was taken from all data sources in one study, which was as many as 106 mothers. This study used secondary data in the form of data taken from medical records obtained manually. **Research Results:** The results of the study found a significant relationship between Leukocyte Levels and the incidence of Early Rupture of Amniotic Membranes at Karunia Kasih Hospital Bekasi obtained *p value* of 0.002. **Conclusions and suggestions:** from all these research activities, it can be concluded that there is a relationship between the length of premature rupture of membranes and leukocyte levels in maternity mothers at Karunia Kasih Hospital Bekasi. Therefore, it is expected that health efforts need to be maximally improved.

Keywords: Early Fracture, Leukocyte Rate, Premature Rupture

Introduction

Early rupture of membranes is a birth problem that can cause complications in the mother, such as intrauterine infection which can cause choroiditis, placental abruption and sepsis. Infection in the mother can occur when the membranes break prematurely, because the rupture of fetal membranes makes it easier for bacteria to enter the uterus and multiply. The development of these bacteria occurs faster in warm and humid environments. The possibility of infection increases in the event of prolonged premature rupture of membranes, because the reproduction time of bacteria is longer (Abrar et al., 2019).

Chemical mediators obtained from tissues infected or damaged by active leukocytes regulate themselves the rate of production of various types of leukocytes. Erythropoietin-like hormones control the differentiation, proliferation, reproduction, and release of leukocytes, which is why leukocytosis is observed in some women who give birth with KPD (Widyana, 2019).

Cases of PROM increase maternal and fetal morbidity and mortality. The main cause is infection and prematurity due to PROM, According to Mahajan and Farooq's findings, premature rupture of membranes increases maternal morbidity, perinatal morbidity, and longer labor mortality and the ever-increasing duration of labor the number of cesarean sections. The highest maternal morbidity was caused

by PROM during the day at 26.7%, On the other hand, most perinatal deaths were caused by PROM within 12-24 hours, which is 30%, and perinatal mortality was 5%. 12-24 hours > KPD 24 hours. With premature PROM, infant survival rates after discharge from the hospital at weeks 22, 23, 24, and 25 are only about 14.1%, 39.5%, 66.8%, and 75.8% (Mahajan and Faruqi 2020).

Early rupture of membranes (PPD) is the rupture of amniotic membranes before the active phase begins, This event is still a major problem in the field of obstetrics, increasing morbidity and mortality rates of mothers and newborns. According to the Basic Health Survey (Riskesdas) in 2020, the prevalence of premature rupture of membranes is 5.6% and can occur in premature or full-term pregnancies. As many as 84.43% of PROM occurred at ≥ 37 weeks gestation, while only 15.57% occurred in premature birth (Indrapermana et al., 2021). In Lampung Province itself, the incidence of premature rupture of membranes is 4.2% in 2019 (Riskesdas, 2019).

According to the World Health Organization (WHO), in 2019, the global maternal mortality rate from birth complications was 810 per day, with 9,300 in some countries, including the United States, 179,000 in North Africa, and 16,000 in Southeast Asia. According to the World Bank, Indonesia's MMR ratio in 2022 is 207 deaths per 100,000 births. Maternal Mortality Ratio (MMR) in Southeast Asian countries such as Malaysia (39/100,000 live births), Thailand (44/100,000 KH). The Philippines (170/100,000 KH), Brunei (60/100,000), Vietnam (160/100,000 KH) and Singapore (3/100,000 KH) have relatively high MMR rates in Indonesia compared to other Southeast Asian countries.

Maternal deaths are caused by diseases or complications related to pregnancy, childbirth, and puerperium. Nationally, the maternal mortality rate (MMR) in Indonesia has decreased from 305 deaths per 100,000 live births (Inter-Census Population Survey, 2015) to 189 deaths per 100,000 live births (2020 Census). The results show a significant reduction, even well below the 2022 target of 205 deaths per 100,000 live births. This achievement must be maintained or even increased to meet the 2024 target of 183 deaths per 100,000 live births. 70 deaths per 100,000 live births by 2030. Based on the results of the Research and Development Sample Registration System (SRS) in 2019, the three most common causes of maternal death were hypertension (33.07%), obstetric hemorrhage (27.03%) and non-obstetric complications (15.7%).

Based on data from the Maternal Perinatal Death Notification (MPDN) of September 21, 2021, the three most common causes of maternal death are eclampsia (37.1%), bleeding (27.3%), infection (10.4%) and primary location of death. be in hospital (84%). According to the Sustainable Development Goals (SDGs), MMR is expected to reach 211 out of 100,000 births worldwide by 2017. Regionally, the MMR birth rate ranks third in ASEAN with a rate of 152 per 100,000 live births, although Indonesia, as a developing country, has a much higher MMR rate. i.e. 177/100,000 live births (WHO). 2019). Maternal death (MMR) is the death of a woman during pregnancy or death within 42 days after abortion, regardless of the length of the pregnancy or the place of birth, i.e. the pregnancy or its treatment, but not due to other causes such as accidents. fall and others.

The results of Long Form SP 2020 show that Indonesia has a maternal mortality rate of 189, which means that 189 women die during pregnancy, childbirth, or postpartum per 100,000 live births. Compared to SP2010 and SUPAS 2015, maternal mortality in Indonesia has decreased. The decrease in maternal mortality from the results of SP2010 and LF SP2020 reached 45 percent. (Ministry of Health, 2020)

The lowest maternal mortality rate is found in DKI Jakarta Province with the number of deaths of pregnant, childbirth, or postpartum women as many as 48 people per 100,000 live births and the highest in Papua Province with the number of maternal deaths during pregnancy, childbirth, or postpartum as many as 565 people. postpartum period per 100,000 live births (Ministry of Health RI 2020). In Indonesia, there were 4,221 mothers who died in 2018-2019 (Indonesia Health Profile 2019). Maternal mortality in Indonesia will reach 207 per 100,000 KH by 2022, exceeding the strategic plan

target of 190 per 100,000 KH. The three leading causes of maternal death were bleeding (30%), high blood pressure during pregnancy or preeclampsia (25%), and infection (12%).

Currently, West Java Province is the province with the most populous population in Indonesia, which is 48.4 million people in 2018 (Indonesian Population Projections 2015-2045). In women aged 10-54 years there were several problems / complications during childbirth, data reached 28.74%, fetus in transverse / reverse position 3.77%, bleeding 3.05%, seizures 0.03%, premature rupture of membranes 7.03%. prolonged delivery 4.94%, wrapped around the umbilical cord 4.67%, placenta previa 1.90%, placental retention 0.61%, hypertension 3.69% and others 6.08%. Some other factors caused by the mother itself, namely predisposing factors, namely the age of the mother under 20 years and over 35 years, and maternal parity, which is over 3 years, have the risk of developing this disease both in terms of birth, work, education and history of the disease. from previous births.

The West Java Provincial Health Office conducted a study on the maternal mortality rate in West Java Province in 2020, which was 85.77 per 100,000 live births, exceeding the target of 85/100,000 KH. The cause is the maternal mortality rate in West Java which increased by 684 cases in 2019 compared to 2020 which was 684 cases. 745 cases. Based on the 2020 Deputy Government/City report, in 2020 there were 745 mothers who died. An increase of 684 cases compared to 2019 which means an increase of 61 cases. The 10 regions/cities that contributed the most maternal deaths in 2020 were Bogor Regency, Karawang Regency, Garut Regency, Sukabumi Regency, Cirebon Regency, Bandung Regency, Indramayu Regency, West Bandung Regency, Cianjur Regency and Purwakarta Regency (Ministry of the Republic of Indonesia). Health 2020).

Causes of high MMR include bleeding, infection, gestational hypertension, prolonged labor, and miscarriage (Nurdin, Ihsanul M, Andi Palancoi 2020).

MMR can be used to describe healthy living, nutritional status and maternal health, healthy environmental conditions, level of health services (especially pregnant women), and level of postpartum and postpartum health services (Sakinah 2019). The main complications are severe bleeding, preeclampsia, eclampsia, obstetric complications, unsafe abortion, and infections that cause almost 75% of MMR events. Infections during pregnancy are more common in mothers with prolonged labor, gonorrhea, and premature rupture of membranes (PMP), with up to 65% of maternal infections being PMP (Wagner, Pimentel, and Eckardt 2017).

The incidence of KPD abroad reaches 6-12% of the total number of newborns, and is spread in developing countries in Southeast Asia such as Indonesia, Malaysia, Thailand, Myanmar, and Laos, but the incidence rate in Indonesia ranges from 4.5-12%. This is 6%. all pregnancies (Susanto et al., 2020).

According to some theories, KPD may be caused by an infection characterized by leukocytosis, and blood tests can determine the possibility of infection in the mother during pregnancy (Rahayu and Sari 2019). An increase in the number of white blood cells (leukocytosis) indicates an infection or acute inflammatory process (Sarwono Prawirohardjo 2019).

Leukocytes are mainly involved in the cellular and fluid defense of the organism against foreign substances and perform their functions inside the connective tissue. When amniotic membranes rupture and microorganisms enter the body, chemicals from infected tissues and damaged activated white blood cells regulate the rate of production of different types of white blood cells. Erythropoietin-like hormones control the differentiation, proliferation, reproduction, and release of white blood cells. This is why leukocytosis is observed in some women who give birth with KPD (Dwi Widyana 2019).

Early rupture of membranes (PMP) is the rupture of amniotic membranes before birth, and the term refers to spontaneous rupture of membranes that occurs before 37 weeks gestation or before signs of labor (Cunningham et al. 2019).

The frequency of PROM is considered quite high compared to other pregnancy problems. The rate of premature and premature PROM is about 10% of all pregnancies and is more common in primiparous women (SD and Akram 2019). On the other hand, the incidence of full-term PROM is about

8% of all pregnancies worldwide. Spontaneous labor after premature rupture of membranes usually occurs within 24 hours, with 79% of women giving birth spontaneously within 12 hours and 95% within 24 hours (Wagner et al. 2019). The incubation period of most PROM patients is 24 hours in both primiparous and multiparous patients, but the length of the incubation period is inversely proportional to the gestational age when PROM occurs (Mondal and Kanongo 2020).

Based on the discussion above, it is clear that infectious diseases are one of the three main causes of maternal death, including PROM. Although there are many studies on PROM, RS Karunia Kasih Bekasi, the only study that compares the relationship between white blood cells and the duration of PROM in full-term and premature pregnancy and evaluates the relationship with socio-demographic factors. **The relationship between the old occurrence of premature rupture of membranes with leukocyte levels in maternity mothers at Karunia Kasih Hospital Bekasi.**

According to *the World Health Organization (WHO, 2017)* shows that the Infant Mortality Rate (AKB) has decreased in recent years. In 2017 the Infant Mortality Rate was 24 deaths per 1000 live births. The infant mortality rate in West Java Province is obtained based on reports from districts / cities, obtained from the number of infant deaths divided by the number of live births multiplied by 1000 KH. The infant mortality ratio in 2020 of 3.18/1000 KH decreased compared to 2019. This is very good because there is a decrease in infant mortality. For data on the birth of babies with low birth weight recorded in (Ministry of Health RI, 2017) as much as 10.2% where preterm delivery (6%), infection (1%), others (3%). As for the profile data of the Ministry of Health of West Java in 2017, based on Regency or City the proportion of the number of AKB in 2017 was 3.4/1000 live births, in this case the AKB data decreased compared to 2016 of 3.93/1000 live births.

Early rupture of membranes caused by infection is a case that causes quite a lot of maternal mortality and morbidity. Currently, the highest incidence of Early Rupture of Amniotic Membranes at Karunia Kasih Hospital Bekasi is Early Rupture of Amniotic Membranes caused by infection in the uterus in 2021, the incidence of which was 125 people (15.74%) from 794 deliveries. Meanwhile, in 2022, the incidence of premature rupture of membranes at Karunia Kasih Hospital Bekasi amounted to 145 people (16.31%) from 889 deliveries.

Early Rupture of Water (KPD) is an axis that causes quite a lot of mortality and maternal morbidity. Currently, the number of KPD incidents is quite large at Karunia Kasih Bekasi Hospital in 2021, the incidence is 125 people (15.74%) from 794 deliveries. Meanwhile, in 2022, the incidence of KPD at Karunia Kasih Hospital Bekasi amounted to 145 people (16.31%) from 889 deliveries.

Based on the results of Widiana's research in 2016 on premature rupture of membranes (KPD) and white blood cell levels in pregnant women, it was proven that 68 (71.5%) of 81 (85.3%) who experienced PROM suffered from leukocytosis. While 12 subjects (12.6%) had normal white blood cell counts. The results of this study showed a relationship between premature rupture of membranes (KPD) with white blood cell levels. Based on research by some experts, this shows that premature rupture of amniotic membranes is closely related to an increase in leukocyte levels in the inflammatory process.

Research Methods

This study used a type of analytical observational research with *a cross-sectional research design* where the research data used secondary data in the form of data taken from the medical records of maternity mothers who had a history of premature rupture of membranes and the results of leukocyte counts on complete blood tests at Karunia Kasih Hospital Bekasi.

This study was conducted in November-December 2023 Population is the entire source of data needed in a study, (Notoatmodjo, 2018). From the above problems, the population in this study is all maternity mothers who experienced premature rupture of membranes at Karunia Kasih Hospital Bekasi within 2022 with medical record data sources and obstetric register books as many as 145 people.

A sample is a portion of the population that represents a population, (Notoatmodjo, 2018). The samples used in this study were 106 mothers who were diagnosed with premature rupture of membranes in the delivery room of Karunia Kasih Hospital Bekasi in 2022.

The analysis of the data used in this study was carried out using the *Statistical for Social Science* (SPSS) application. Data processing is carried out after medical records are collected, and data is presented in table format accompanied by explanations, arranged and grouped according to the purpose of the study. With Univariate and Bivariate analysis tests.

Research Results

Old Frequency Distribution of Maternity Women Who Experience Early Rupture of Water at Karunia Kasih Hospital Bekasi in 2022 KPD In Maternity Mothers

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid KPD < 12 Jam	43	40.6	40.6	40.6
KPD > 12 Jam	63	59.4	59.4	100.0
Total	106	100.0	100.0	

Shows that maternity mothers who experience premature rupture of membranes, in the variable length of KPD maternity there are 43 respondents (40.6%) included in the category with a KPD length of < 12 hours, while 63 respondents (59.4%) included in the category of KPD length > 12 hours

Frequency Distribution with Leukocyte Levels in Maternity Women at Karunia Kasih Hospital Bekasi in 2022 Up to Leukocytes

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Leukocytes up to normal (< 16,000/mm ³)	51	48.1	48.1	48.1
the rate of leukocytes increases (≥16.000/mm ³).	55	51.9	51.9	100.0
Total	106	100.0	100.0	

Showed that in the leukocyte variable there were 51 respondents (48.1%) with normal leukocytes, and 55 respondents (51.9%) who had leukocytosis (leukocytes increased).

Analysis of the Relationship of the Leukocyte Rate of maternity mothers With the Old Occurrence of KPD Leukocyte Rate * KPD In Maternity Mothers Crosstabulation

		KPD In Maternity Mothers		Total
		KPD < 12 Jam	KPD > 12 Jam	
Up to Leukocytes up to normal (< 16,000/mm ³)	Count	29	22	51
	Up to % Leukocytes	56.9%	43.1%	100.0%
the rate of leukocytes increases (≥16.000/mm ³).	Count	14	41	55
	Up to % Leukocytes	25.5%	74.5%	100.0%
Total	Count	43	63	106

Up to % Leukocytes	40.6%	59.4%	100.0%
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Based shows the relationship between the level of leukocyte levels and the duration of premature rupture of membranes. Based on the table, there were 51 respondents who were classified as having a normal white blood cell count, where 29 respondents (56.9%) experienced premature rupture of membranes < 12 hours and 22 respondents (43.1%) experienced premature rupture of membranes > 12 hours. While there were 55 respondents who fell into the category of increased white blood cell count (leukocytosis) and 14 respondents (25.5%) experienced premature rupture of membranes within < 12 hours and there were 41 respondents (74.5%) experienced premature rupture of membranes > 12 hours.

Analysis of the relationship of leukocyte rates with the old occurrence of KPD Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.827a	1	.001		
Continuity Correction ^b	9.564	1	.002		
The Ratio of The	11.014	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	10.725	1	.001		
N of Valid Cases	106				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.69.

b. Computed only for a 2x2 table

Based on the *chi square test* on the relationship of leukocyte levels to the incidence of premature rupture of membranes at Karunia Kasih Hospital Bekasi, a *p value of 0.002* was obtained which was smaller than the alpha value of 5% or 0.05 ($p < 0.05$). This shows that there is a significant relationship between Leukocyte Levels and the incidence of Long Premature Rupture of Water at Karunia Kasih Hospital Bekasi.

Discussion

In this chapter, the author will discuss the results of research presented in the form of a frequency distribution table showing that the incidence of premature rupture of membranes (KPD) is still quite high. The number of premature rupture of membranes in 2022 is 145 maternity mothers. In the results of the study, it can be seen that the factors that influence the occurrence of premature rupture of membranes in maternity mothers are caused by leukocyte levels in maternity mothers.

Univariate Analysis

A. Maternity Mothers Who Have Early Fractures

The results of the univariate study found that maternity mothers who experienced KPD at the Bekasi Karunia Kasih Hospital in 2021 had an incidence of 125 people (15.74%) from 794 deliveries. Meanwhile, in 2022, the incidence of KPD in maternity mothers at Karunia Kasih Hospital was 145 people (16.31%). Maternity mothers who experienced KPD there were 43 respondents (40.6%) who fell into the category with a KPD duration of <12 hours, and 63 respondents (59.4%) included in the category of KPD length > 12 hours Of the 889 mothers who gave birth, as many as 106 mothers experienced premature rupture of membranes (KPD).

The results of this study are in accordance with the theory of premature rupture of membranes

(KPD) or often also called *Premature Rupture of the Membrane* (PROM) is a state of rupture of the amniotic membrane before the opening of the active phase (opening < 4 cm) (Nugroho, 2018). If KPD occurs before 37 weeks gestation, it is called premature rupture of membranes in premature pregnancy. Of all pregnancies the incidence of KPD ranges from 8-10%. (Prawirohardjo, 2012). In term pregnancy the incidence is 84.43%. Meanwhile, in preterm pregnancy the incidence is 15.57% (Indrapermana *et al.*, 2021).

B. The rate of leukocytes in maternity mothers suffering from KPD

This study showed that in the leukocyte variable there were 51 respondents (48.1%) with In this study showed that for the white blood cell variable there were 51 (48.1%) respondents with normal white blood cells and 55 (51.9%) with leukocytosis (increased number of white blood cells).

The results of this study fit with the theory that white blood cell counts change significantly during pregnancy. The white blood cell count is usually between 5,000 and 12,000/m³, the number of these cells can increase during the postnatal period, and in early postnatal the number of cells can increase to more than 25,000/m³, but the average is 14,000-16,000/m³. (Cunningham *et al.* 2019).

Leukocytosis means an increase in the number of white blood cells in the blood, and leukopenia means a decrease in the number of white blood cells in the blood (Kee 2018; Nugraha 2018). White blood cells serve as an indicator of infection in the body (Gomez *et al.* 2018).

The normal range for leukocyte counts varies and changes with age and pregnancy. The number of leukocytes increases significantly in healthy pregnancies due to neutrophil leukocytosis. The typical reference interval during pregnancy is 6,000 – 16,000/mm³. The number of leukocytes increases sharply during normal delivery with an average leukocyte count of 10000 – 16,000/mm³ and a maximum limit of 29,000/mm³.

Immature white blood cells, such as myelocytes and metamielocytes, can be found in the peripheral blood counts of healthy mothers during pregnancy. The number of lymphocytes decreases in the first and second trimesters, then increases in the third trimester. Monocyte levels increase in the first trimester and then decrease as pregnancy progresses. The number of eosinophils and basophils does not change during pregnancy. Pregnancy-related white blood cell changes persist for 6 to 8 weeks after delivery (Morton, 2021).

Bivariate Analysis

A. Relationship of Maternal Leukocyte Rate With Old Occurrence of KPD

This study shows a relationship between leukocyte levels and the duration of premature rupture of membranes. Based on the table, there were 51 respondents who were classified as having a normal white blood cell count, of which 29 respondents (56.9%) experienced premature rupture of membranes within 12 hours. Based on the table, there were 55 respondents who fell into the category of increased white blood cell count (leukocytosis) and 14 respondents (25.5%) experienced premature rupture of membranes within 12 hours.

Based on the chi-square test of the relationship between white blood cell levels and the duration of premature rupture of membranes at RS Karunia Kasih Bekasi obtained a p-value of 0.002, because $0.002 < \alpha = 0.05$, H₀ was rejected, it can be concluded that there is a significant relationship between leukocyte levels and the duration of premature rupture of membranes at Karunia Kasih Hospital.

The results of this study are consistent with the theory that premature rupture of membranes (PROM) over a long period of time can increase the risk of infection, which is usually characterized by an increase in the mother's white blood cell count. The study also agrees with Manuaba's opinion that the longer the incubation period of labor, the greater the chance of infection in the uterus. Of course, this depends on the length of the amniotic rupture.

Cross-tabulations of the duration of premature rupture of membranes and white blood cell values

in women who gave birth with PROM showed that the longer the rupture of membranes, the higher the white blood cell values. Based on the data obtained by researchers, the duration of rupture of membranes exceeded 12 hours and 74.5% experienced leukocytosis as shown in Table 5.4.1. (Manuaba 2018).

The results of this study are also in line with Erni Dwi Widayana's research on premature rupture of membranes and white blood cell levels in mothers during childbirth. He concluded, there is a relationship between the duration of amniotic rupture with an increase in maternal white blood cells. important. Based on the results obtained, the duration of the rupture of membranes is more than 12 hours or more than 24 hours. 100% have leukocytosis. (Dwi Widayana, 2016).

The results of this study are not in accordance with Anisa Firdausi's research. Anisa Firdausi's research shows a weak and insignificant relationship between the duration of premature rupture of membranes with the number of maternal white blood cells (Firdausi 2017).

Prawiroharjo explained, this shows that there may be other factors that can cause changes in white blood cell counts in mothers with PROM. Infection during pregnancy has several causes, including malaria, hepatitis, influenza, acute respiratory infections, and bronchitis. However, in this study, these factors became exclusion criteria when selecting samples (Sarwono Prawirohardjo, 2018).

Based on the results of the study conducted, 51 respondents (48.11%) had a normal white blood cell count and 55 (51.88%) respondents had an increased number of white blood cells. White blood cells, or white blood cells, are one of the blood-forming elements that help protect the body from pathogen attack and remove toxins, waste products, and abnormal or damaged cells. One microliter of human blood consists of 5,000 to 10,000 white blood cells. In pregnant women, all parts of the body undergo changes as an adaptation to the presence of the fetus. The number of white blood cells, which are an important component of blood, is suppressed during the first and second trimesters and increases in the third trimester.

Based on the results of the study conducted, it was found that the number of normal white blood cells was 51 respondents (48.11%) and the number of white blood cells increased by 55 respondents (51.88%). White blood cells, or white blood cells, are one of the blood-forming elements that help protect the body from pathogen attack and remove toxins, waste products, and abnormal or damaged cells. One microliter of human blood consists of 5,000 to 10,000 white blood cells. In pregnant women, all parts of the body undergo changes to adapt to the presence of the fetus. The number of white blood cells, which are an important component of blood, is suppressed during the first and second trimesters and increases in the third trimester.

This is a manifestation of physiological changes in pregnancy. White blood cell counts change significantly during pregnancy, but are usually between 5,000 and 12,000/ μ L. During labor and early puerperium, the number can increase rapidly to more than 25,000/ μ L, but the average is 14,000–16,000/ μ L (H. Martini and L. Nath 2018).

Studies have shown that infection is a major contributing factor to premature rupture of membranes. Infection can stimulate prostaglandin production and increase the risk of premature rupture of the amniotic sac due to damage to the amniotic membrane. Some vaginal bacteria produce phosphopase A2, which releases arachidonic acid. In addition, the body's immune response to bacterial infection increases cytokine production, which in turn increases prostaglandin production. Cytokine stimulation is also associated with the induction of cyclooxygenase II, an enzyme that converts arachidonic acid into prostaglandins.

These cytokines also increase MMP and TIMP levels causing an imbalance that can lead to weakening and damage to amniotic membranes, and eventually rupture of amniotic membranes. Although studies have not shown a link between white blood cell levels and infectious agents, blood tests performed each time a patient is admitted to the hospital can help complete the diagnosis and inform further diagnostic processes. Laboratory tests, including white blood cell counts, become a benchmark to monitor the development of the disease

Conclusions

In the Karnia Kasi Bekasi RS there is a meaningful relationship between the number of mother's white blood cells and the old rupture early and the *p-value* of 0.002 ($p < 0.5$).

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