



The effectiveness of vitamin C supplements in pregnant women toward premature rupture of membranes

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ARTICLE INFO

Article history:

Received October 29, 2019
Accepted January 06, 2020
Published June 05, 2020

Keyword:

Pregnancy
Premature Rupture of Membranes
Vitamin C

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DOI: <https://doi.org/10.30604/jika.v5i1.237>

ABSTRACT

Premature rupture of membranes (PROM) is a problem related to maternal mortality caused by infection. The purpose of this study is to uncover new things, namely the effectiveness of vitamin C supplementation in pregnant women to prevent the occurrence of PROM. This research is a quasi-experimental study. The study population was all pregnant women with predisposing factors. The sample in this study, most pregnant women aged ≥ 20 weeks with predisposing factors of PROM who met the inclusion and exclusion criteria were 200 pregnant women, consisting of 100 pregnant women in the experimental group and 100 pregnant women in the control group. Data processing uses univariate, bivariate and multivariate analysis. Data collection is done by observation at the time of delivery. The results of the study of 100 pregnant women in the experimental group were 6% who experienced PROM after consuming vitamin C while out of 100 pregnant women in the control group who experienced PROM as much as 56%. The results of the study prove that the provision of vitamin C in pregnant women is effective in preventing the incidence of premature rupture of membranes (OR = 13,184). This study concludes that to prevent the occurrence of premature rupture of membranes it is recommended that pregnant women starting at gestational age ≥ 20 weeks consume vitamin C 100 mg / day.

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Efektivitas pemberian suplemen vitamin C pada ibu hamil terhadap kejadian ketuban pecah dini

ABSTRAK

Ketuban Pecah Dini (KPD) merupakan suatu masalah yang berhubungan dengan kematian ibu yang disebabkan oleh infeksi. Tujuan penelitian ini mengungkap hal baru yaitu efektivitas pemberian suplemen Vitamin C pada ibu hamil untuk mencegah terjadinya PROM. Penelitian ini merupakan penelitian quasi eksperimen. Populasi penelitian adalah semua ibu hamil dengan faktor predisposisi. Sampel dalam penelitian, sebagian ibu hamil usia kehamilan ≥ 20 minggu dengan faktor predisposisi PROM yang memenuhi kriteria inklusi dan eksklusi sebanyak 200 ibu hamil, yang terdiri dari 100 ibu hamil kelompok eksperimen dan 100 ibu hamil kelompok kontrol. Pengolahan data menggunakan analisis univariat, bivariat dan multivariat. Pengumpulan data dilakukan dengan observasi pada saat persalinan. Hasil penelitian dari 100 ibu hamil pada kelompok eksperimen sebanyak 6% yang mengalami PROM setelah mengkonsumsi vitamin C sedangkan dari 100 ibu hamil pada kelompok kontrol yang mengalami PROM sebanyak 56%. Hasil penelitian membuktikan bahwa pemberian vitamin C pada ibu hamil efektif untuk mencegah kejadian Ketuban Pecah Dini (OR=13,184). Penelitian ini menyimpulkan bahwa untuk mencegah kejadian ketuban pecah dini disarankan ibu hamil mulai usia kehamilan ≥ 20 minggu mengkonsumsi vitamin C 100 mg/hari.

Kata kunci:

Kehamilan
Ketuban Pecah Dini
Vitamin C

Introduction

Maternal mortality is the death of a woman during pregnancy, childbirth or 42 days after delivery with causes that are directly or indirectly related to labor. The *World Health Organization* (WHO) estimates that 800 women die every day due to pregnancy complications and the birth process. About 99% of all maternal deaths occur in developing countries and 80% of maternal deaths are due to increased complications during pregnancy, childbirth and after childbirth (WHO, UNICEF, 2015). The cause of maternal mortality in the field of obstetrics is due to infection, eclampsia, bleeding, amniotic fluid embolism and others. Most infections experienced by mothers are mostly due to complications or complications of pregnancy, such as febrile, chorioamnionitis, urinary tract infections and as much as 65% are due to early rupture of membranes which often cause infections in mothers and infants (Prawirohardjo, 2012, p. 678)

Premature rupture of membranes (PROM) is a condition during pregnancy where there is a discharge of amniotic fluid before entering labor. This situation can be at risk of causing infection in the fetus or premature birth and is a problem related to maternal death caused by infection (Prawirohardjo, 2012, p. 678)

In Indonesia, it is estimated that every year 20-30% of women experience premature rupture of membranes. The incidence of premature rupture of membranes ranges from 8-10% of all deliveries (West Java Health Office, 2016). Data obtained from the District Hospital of Indramayu in 2018 there were 799 cases of labor with premature rupture of membranes (RSUD, 2018). Data from the Indramayu District Health Office in 2018, the number of maternal deaths totaled 61 cases, while the causes of maternal mortality were bleeding 10 cases, hypertension in pregnancy 20 cases, sepsis or infection 8 cases, abortion 1 case, circulatory disorders 9 cases, interference metabolism of 2 cases and 11 others (Health Office, 2018)

Premature rupture of membranes can have an impact on maternal mortality especially if complications occur which also have an impact on the baby. The high cases of premature rupture of membranes needs attention, especially in efforts to reduce maternal and infant mortality rates. Because of the various negative effects for both the mother and the fetus, through this study a new phenomenon that can be uniquely revealed through the provision of vitamin C supplements in pregnant women with predisposing factors for premature rupture of membranes to prevent the incidence of PROM. Vitamin C is a cofactor of collagen formation. Vitamin C deficiency causes the structure of collagen that is formed imperfectly. Vitamin C plays a role in collagen synthesis and degradation as well as for maintenance of the membranes. The amniotic membrane has a different elasticity depending on the level of vitamin C in the mother's blood. Lack of vitamin C intake during pregnancy is one of the risk factors for premature rupture of membranes. Giving vitamin C 100 mg / day after 20 weeks gestation is effective in reducing the incidence of premature rupture of membranes. (Casanueva et al., 2005).

The use of vitamin C during pregnancy can modulate collagen metabolism and cause membrane strength from the amniotic chorion during pregnancy. Low intake of vitamin C during pregnancy is associated with an increased risk of PROM events, this is thought to be due to the weakness of the helical structure of the amniotic membrane extracellular matrix collagen due to disruption in the process of collagen molecular formation (Dewoto, H. R., & Wardhini, 2007).

According to research Ghomian et al (2013) from the results of clinical trial research stated that of 170 pregnant women with a history of PPRM (*Premature Prelabour Rupture of Membrane*) in previous pregnancies, PPRM was more common in the control group 44.7% and case group 31.8 %. PROM (*Prelabour Rupture Of Membrane*) occurred 34.1% in the control group and 18.8% in the case group ($p = 0.05$). The conclusion of this study is that giving 100 mg of vitamin C daily from 14 weeks' gestation can prevent PPRM and PROM (Ghomian, Hafizi, & Takhti, 2013). Vitamin C has been known to play an important role in maintaining the integrity of the membrane (layer) that surrounds the fetus and amniotic fluid. Previous studies have linked low levels of vitamin C in mothers to an increased risk of premature membrane rupture. The purpose of this study was to determine the effectiveness of vitamin C supplementation for pregnant women with the predisposing factor of PROM to the incidence of PROM in Indramayu Regency.

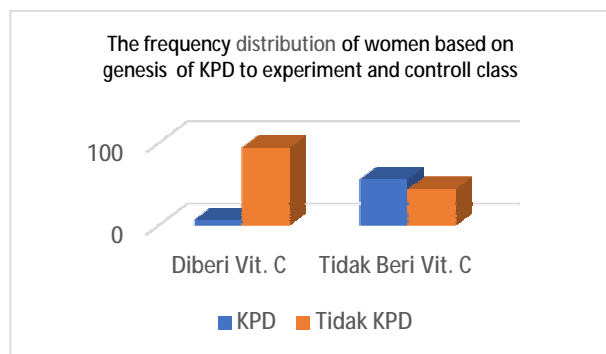
Method

This research is a quasi-experimental study which aims to reveal the causal relationship by involving the control group and the experimental group. The experimental group was treated by consuming vitamin C while the control group was not treated. Then each group was observed at the time of labor to determine the incidence of fetal rupture of membranes (Badriah, 2012, p. 40). The design of this study used a post test only control group design, where the subjects of the study were all populations that met the inclusion and exclusion criteria. Inclusion criteria were willing to be a respondent, received approval from her husband, willing to consume vitamin C tablets 100 mg / day during the research program regularly until delivery, had a predisposing factor for PROM, gave birth at the community health center and Regional Hospital of Indramayu Regency while the exclusion criteria was allergic to vitamins C and do not consume vitamin C regularly / regularly. The study population was all pregnant women with predisposing factors namely maternal age, parity, history of premature rupture of membranes in previous labor, chronic lack of energy (KEK) and infection. The sample in this study, most pregnant women aged ≥ 20 weeks with predisposing factors of PROM who met the inclusion and exclusion criteria were 200 pregnant women, consisting of 100 pregnant women in the experimental group and 100 pregnant women in the control group. The experimental group was given treatment to consume vitamin C 100 mg / day on a regular basis starting from gestational age ≥ 20 weeks until delivery and measurements were taken during delivery whether or not PROM occurred while the control group was not given vitamin C only to be measured at the time of delivery. Data processing using univariate, bivariate and multivariate analysis with Chi-Square test and Multiple Logistic Regression. Data collection was carried out by observation at delivery with the research instrument using observation sheets prepared by researchers. Observation is a way of collecting data by making observations directly to research respondents to look for changes or things that will be examined (Hidayat, 2014, p. 90). Observations in this study include: vit consumption. C in the intervention group, PROM events, and upper arm circumference (MUAC) were analyzed descriptively. The study was conducted in 5 Indramayu Community Health Centers, namely Margadadi, Pasekan,

Sindang, Lohbener and Pondoh. Data collection was carried out in July - September 2019.

Results and Discussion

Based on the results of data collection with 200 pregnant women predisposed to PROM (100 pregnant women in the experimental group / vitamin C consumption and 100 pregnant women in the control group / not consuming vitamin C), the data is obtained as shown in Figure 1.



Picture. 1
 PROM genesis frequency distribution

The results of research conducted in the experimental group and the control group of 100 maternity mothers in the experimental group there were 6 people (6%) occurred Premature rupture of membranes while 94 people (94%) did not occur early rupture of membranes. In the control group of 100 people there were 56 people (56%) occurred PROM while 44 people (44%) did not occur PROM. In the variable age of mothers in the group given vitamin C, out of 100 people found that mothers aged <20 years were 9 people (9.0%) and those aged > 35 years were 52 people (52%) whereas in the group of mothers who were not given Vitamin C, found that mothers aged <20 years were 18 people (18.0%) and those aged > 35 years were 42 people (42.0%) (table 1).

Table 1
 Frequency Distribution Based on Age, Parity, History of PROM and LILA in Indramayu District Health Center (N = 200)

Variable	Grup			
	Given Vit. C		Not given Vit. C	
	N	%	N	%
Mother's Age				
< 20 year	9	9,0	18	18,0
20-35 year	39	39,0	40	40,0
> 35 year	52	52,0	42	42,0
Total	100	100,0	100	100,0
Parity				
First	24	24,0	45	45,0
Second	30	30,0	30	30,0
Third	20	20,0	18	18,0
Fourth	9	9,0	6	6,0
Fifth	11	11,0	1	1,0
Sixth	2	2,0	0	0,0
Seventh	4	4,0	0	0,0
Total	100	100,0	100	100,0
PROM History				
No history	74	74,0	85	85,0
History	26	26,0	15	15,0
Total	100	100,0	100	100,0
LILA				
No KEK	61	61,0	68	68,0
KEK	39	39,0	32	32,0
Total	100	100,0	100	100,0

In the parity variable in the group that was given vitamin C, out of 100 people found mothers with the first parity of 24 people (24.0%) while in the group of mothers who were not given Vitamin C, obtained mothers with first parity were 45 people (45.0%).

In the history of PROM variable in the group that was given vitamin C, out of 100 people obtained mothers with a history of PROM as many as 74 people (74.0%) while in the group of mothers who were not given Vitamin C, obtained mothers with a history of PROM were 85 people (85.0%).

In the LILA variable in the group given vitamin C, out of 100 people obtained mothers with KEK (Chronic Energy Deficiency) as many as 39 people (39.0%) while in the group of mothers who were not given Vitamin C, 32 KEK mothers were obtained (32, 0%).

The bivariate analysis in this study is the relationship between maternal age, parity, history of PROM and LILA with the incidence of early rupture of membranes (PROM).

Relationship between mother's age and the incidence of premature rupture of membranes

Based on the results of the study, it was found that from 27 mothers aged <20 years, there were 14 (51.9%) who experienced PROM, out of 79 mothers aged 20-35 years, there were 18 (22.8%) who experienced PROM, and from 94 mothers aged > 35 years, there were 30 (31.9%) who

experienced PROM. Statistical test results obtained p value = 0.018 smaller than alpha value of 0.05, it can be concluded that there are significant differences in the incidence of PROM among mothers aged <20 years, 20-35 years, and > 35 years, so it can be said that there are the relationship between maternal age and the incidence of PROM (table 2).

Table 2
Distribution of Mothers Based on Predisposing Factors for Premature Rupture of Membranes Disease in Indramayu Community Health Center.

Variable	Premature Rupture of Membranes				Total		P Value
	No PROM		PROM		n	%	
	n	(%)	n	%			
Mother's age							
< 20 year	13	48,1	14	51,9	27	100,0	0,018
20-35 year	61	77,2	18	22,8	79	100,0	
> 35 year	64	68,1	30	31,9	94	100,0	
Parity							
First	44	63,8	25	36,2	69	100,0	0,309
Second	46	76,7	14	23,3	60	100,0	
Third	23	60,5	15	39,5	38	100,0	
Fourth	10	66,7	5	33,3	15	100,0	
Fifth	10	83,3	2	16,7	12	100,0	
Sixth	1	50,0	1	50,0	2	100,0	
Seventh	4	100,0	0	31,0	4	100,0	
PROM History							
No history	111	69,8	48	30,2	159	100,0	0,765
History	27	65,9	14	34,1	41	100,0	
LILA							
No KEK	85	65,9	44	34,1	129	100,0	0,262
KEK	53	74,6	18	25,4	71	100,0	
Vitamin C							
Given Vit. C	94	94,0	6	6,0	100	100,0	0,000
Not given Vit. C	44	44,0	56	56,0	100	100,0	

The results of this study are in line with research conducted (Rohmawati et al., 2018) which states that maternal age is a factor related to the incidence of PROM with the results of the analysis obtained p value = 0.033 where p value <0.05 means there is a relationship between ages mother with Early Amniotic Disorders.

The age factor has a very strong influence on the development of female reproductive organs, where healthy reproduction is the safest age for a woman to get pregnant and give birth. Age that is too young (<20 years old) or too old (> 35 years old) has a greater risk of giving birth to an unhealthy baby, which means that in line with age, there is not a slight decline in organ function. Age of mothers <20 years, including age that is too young with a condition of the uterus that is not mature enough to give birth so it is prone to premature rupture of membranes. While mothers with age > 35 years are too old to give birth, especially for mothers who are *primi* (old) and at risk of premature rupture of membranes. In women aged 20-35 years who are considered ideal for undergoing pregnancy and childbirth. In this age range the physical condition of a woman in top condition, the uterus is able to provide maximum protection or conditions for pregnancy because it is a period of healthy reproduction (Manuaba, 2010, p. 235)

The results of the study are in accordance with existing theories so that one way to prepare for an optimal pregnancy until delivery is to do a routine ANC so that pregnant women

of risky age or not at risk of being exposed to information about danger signs during pregnancy, especially premature rupture of membranes so that they can prevent the occurrence of PROM and if there is a danger sign then immediately contact the nearest health worker.

Relationship of Parity Toward Premature Rupture of Membranes

Based on the results of the study, it was found that from 69 first pregnant women, there were 25 (36.2%) who experienced PROM, out of 60 second pregnant women, there were 14 (23.3%) who experienced PROM, out of 38 third pregnant women, there were 15 (39.5%) who experienced PROM, out of 15 fourth pregnant women, there were 5 (33.3%) who experienced PROM, out of 12 fifth pregnant women, there were 2 (16.7%) who experienced PROM, from 2 sixth pregnant women, there was 1 (50.0%) who experienced PROM, and from 4 seventh pregnant women, none (0.0%) experienced PROM. Statistical test results obtained p value = 0.309 is greater than the alpha value of 0.05, it can be concluded that there is no significant difference in the incidence of PROM among first to seventh pregnant women, it can also be said that there is no relationship between parity and the incidence of PROM. This is not in line with research conducted (Legawati & Riyanti, 2018) which states that maternal parity has a significant

effect on the incidence of primiparous PROM 1.5 times higher than that of multipara.

Parity is the large number of children born to women, both living and dead. The higher the parity of the mother, the easier the amniotic fluid infection due to damage to the structure of the cervix due to previous labor. Mothers who give birth are several times more at risk of premature rupture of membranes because uterine vascularization is disrupted which causes the amniotic membrane connective tissue to become brittle and eventually burst spontaneously. In multipara, the connective tissue that supports the amniotic membrane decreases so that multipara is more at risk of premature rupture of membranes compared to nulliparous. The consistency of the cervix in labor greatly influences the occurrence of premature rupture of membranes. In multiparas with thin cervical consistency, the possibility of premature rupture of membranes is greater with the presence of intra uterine pressure at the time of delivery. Thin cervical consistency with the process of cervical formation in multiparas can accelerate cervical opening so that there is a risk of rupture of membranes before complete opening (Cunningham, F. G., Gant, N. F., Leveno, K. J., Gilstrap, L. C., Hauth, J. C., & Wenstrom, 2006)

The results of the study can illustrate that there is no relationship between parity and the incidence of PROM. This is not in accordance with existing theories, this shows that the incidence of PROM not only occurs because of repeated uterine stretches, but other factors also affect. Some possibilities for pregnant women to have a quality pregnancy check up (routine ANC) so they can monitor the health of the mother and fetus and have received complete information from health workers about the danger signs of advanced pregnancy so that mothers make some efforts to be able to prevent it properly.

Relationship of PROM History to The Incidence of Premature Rupture of Membranes

Based on the results of the study, it was found that of 159 mothers who did not have a history of PROM, there were 48 (30.2%) mothers who experienced PROM, and of 41 mothers who had a history of PROM, there were 14 (34.1%) who experienced PROM. Statistical test results obtained p value = 0.765 greater than alpha value of 0.05, it can be concluded that there is no significant difference in the incidence of PROM between mothers who have a history of PROM with mothers who do not have a history of PROM, it can be said that there is no relationship between history of PROM mothers with PROM events.

The results of this study are not in line with research (Alim & Safitri, 2015) which states that past history of PROM

has an effect on the incidence of PROM 15.99% and is not in accordance with existing theories that a history of premature rupture of membranes at 2-4 times risk of experiencing premature rupture of membranes back. Women who experience premature rupture of membranes in pregnancy or before delivery then in subsequent pregnancies are more at risk of experiencing a return of between 3-4 times than women who do not experience premature rupture of membranes before, this is because the membrane composition becomes fragile and collagen content decreases in the next pregnancy. This is not in accordance with the results of the study which showed that there was no correlation between the history of the PROM and the incidence of the PROM because the number of respondents sampled in the PROM case was 41 people (20.5%) while the respondents who had no history of the PROM were 159 people (79, 5%).

Relationship of LILA with Premature Rupture of Membranes

Based on the results of the study, it was found that from 129 mothers who did not experience KEK, there were 44 (34.1%) mothers who experienced PROM, and from 71 mothers who experienced KEK, there were 18 (25.4%) who experienced PROM. Statistical test results obtained p value = 0.262 greater than alpha value of 0.05, it can be concluded that there is no difference in the incidence of PROM between mothers who did not experience KEK and mothers who experienced KEK, it can be said that there is no relationship between LILA and the incidence of PROM .

Maternal nutritional status is related to the adequacy of nutritional needs for pregnant women and fetuses in the womb. The process of formation of the membranes and fetal growth in the womb requires the availability of energy and nutrition. Good nutritional intake for pregnant women in terms of maternal weight gain during optimal pregnancy is 20% of maternal weight before pregnancy. Pregnant women who experience malnutrition will cause vitamin deficiency in the body so that the formation of collagen is disrupted and causes fragile amniotic membranes and prone to premature rupture of membranes (Prawirohardjo, 2012, p. 678).

The results of the study illustrate that there is no relationship between KEK pregnant women and the incidence of premature rupture of membranes. This is because KEK is one indicator to assess the nutritional status of pregnant women, where the nutritional status of pregnant women is not only assessed based on KEK alone but can be assessed from the results of the Body Mass Index (BMI) and Hemoglobin levels so that in the nutritional status there may be other factors that cause PROM.

Table 3
 Final Model of Multivariate Analysis

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95,0% C.I.for EXP(B)	
							Lower	Upper
Age	-3.378	1.115	9.185	1	0.002	0.034	0.004	0.303
History of PROM	3.476	1.110	9.811	1	0.002	5.334	3.673	8.642
LILA	2.734	1.117	5.992	1	0.014	5.197	1.724	7.482
Vitamin C	4,882	1,050	21,630	1	0,000	13,184	6,851	31,634

The Effect of Giving Vitamin C Supplements on the Occurrence of Premature Rupture of Membranes

In the final model of multivariate analysis, it turns out that variables that are significantly related to the incidence of

PROM are maternal age, history of PROM, MUAC and Vitamin C. The analysis shows that the strength of the relationship between history of PROM with the incidence of PROM is 5.334 meaning that mothers who have a history of PROM are 5.334 times more at risk experience PROM compared to

women who have no history of PROM after being controlled by maternal age and parity variables. The strength of LILA's relationship with the occurrence of PROM was 5.197, meaning that mothers with SEZ were 5.197 times more likely to experience PROM compared to mothers who did not have SEZ after being controlled by the variable Age of Mother and Parity. The strength of the relationship of Vitamin C consumption with the incidence of PROM is 13,184 meaning that mothers who do not consume vitamin C are 13,184 times more likely to experience PROM than mothers who consume vitamin C after being controlled by variables of maternal age and parity.

Of the three variables that are thought to influence the incidence of PROM, the vitamin C variable has the most influence compared to other variables, meaning that giving vitamin C to pregnant women is effective in preventing PROM after being controlled by predisposing factor variables. PROM is known as a major cause of preterm birth and is associated with increased rates of neonatal and maternal morbidity and mortality. Despite having different causes, collagen metabolism is considered a major factor in premature rupture of membranes. One of the triggers for premature rupture of membranes is a decrease in the integrity of the chorioamnion membrane connective tissue (Hauth et al., 2010). The results of the study (Hasaneroğlu et al., 2014) stated that term pregnancies with premature rupture of membranes had a statistically lower quantity of collagen in the amniotic membrane.

Vitamin C can be obtained from fruits and vegetables, but during pregnancy the plasma concentration of vitamin C decreases progressively. This decrease is largely the effect of hemodilution. The use of vitamin C during pregnancy can modulate collagen metabolism and cause membrane strength from the amniotic chorion during pregnancy. Low intake of vitamin C during pregnancy is associated with an increased risk of PROM events, this is thought to be due to the weakness of the helical structure of the amnion membrane extracellular matrix collagen due to disruption in the formation process of collagen molecules, vitamin C itself plays an important role in the process of hydratization of the collagen helical structure. Collagen protein requires vitamin C for hydration, which allows the molecule to reach its best form, preventing collagen weakness and susceptibility to damage. The benefits of vitamin C for pregnancy are maintaining the integrity of the membrane that surrounds the fetus and amniotic fluid, preventing premature rupture of membranes, helping the formation of blood Hb, preventing infection and strengthening the immune system. In particular, vitamin C helps the formation of collagen tissue as a connective tissue to strengthen the amniotic membrane, avoiding infections that cause premature rupture of membranes (Mercer et al., 2010).

The results showed that supplementation of Vitamin C supplements of 100 mg / day starting from gestational age \geq 20 weeks until delivery was proven effective to prevent the incidence of PROM. This is in line with research (Haji Foghaha, Keshavarz, Parsanezhad, & Rajaeefard, 2009) which

states that giving vitamin C supplements of 100 mg in pregnant women after 20 weeks' gestation can significantly reduce the incidence of PROM and PPROM. (Casaneuva et al., 2005) showed that 100 mg of vitamin C / day was sufficient to maintain leukocyte concentrations of ascorbic acid at levels above 10 mg / 108 cells to protect against PROM (in literature review (Bainuan, 2018). Ghomian et al., 2013) also found similar results that giving 100 mg vitamin C supplements daily from 14 weeks' gestation can prevent PPROM and PROM

From the results of this study prove that the administration of vitamin C supplements of 100 mg / day starting from gestational age \geq 20 weeks to the point of delivery in pregnant women with predisposing factors PROM proven effective for preventing the occurrence of ruptured amniotic because Vitamin C has an important role in the formation of collagen in Amniotic membrane so as to protect the membranes and maintain membrane integrity so that it can prevent premature rupture of membranes.

Limitations of this study include, the study sample group uses a 1:1 comparison between cases and controls and the sample is taken using a purposive sampling method, so that the next researcher can use a case and control group comparison to 1:2 and use a random sampling method so that the results research can be generalized.

Conclusions and Recommendations

The incidence of premature rupture of membranes is more common in groups not given Vitamin C, which is 56 people (56%) compared to the group given vitamin C, which is 6 people (6%) so that the provision of vitamin C supplements is effective in preventing the occurrence of ruptured amniotic in pregnant women after being controlled by predisposing factors (OR = 13,184).

For the local government, it can be socialized to health workers through CIE activities (Communication, Information and Education) during antenatal care checks on vitamin C consumption which can help to prevent premature rupture of membranes. For pregnant women, it is hoped that it can increase knowledge about the danger signs of pregnancy through media sources of information, especially from health workers about premature rupture of membranes so that they can be prevented and immediately check with health workers when experiencing complaints of danger signs. For further research can take other variables so that it can be known the factors that influence premature rupture of membranes with other research designs.

Acknowledgement

The author would like to thank the Ministry of Research, Technology and Higher Education for funding this research through the Fundamental Research Grant Fund for the Ministry of Research and Technology in 2019.

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