Research Report

Vitamin C Level in Pregnant Women with Premature Rupture of the Membrane (PROM) and in Women with Normal Pregnancy

Kadar Vitamin C pada Ibu Hamil dengan Ketuban Pecah Dini dan Kehamilan Normal

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Abstract

Objective: To compare vitamin C level in term pregnant women with PROM and in women with normal pregnancy.

Method: This is a cross sectional study, research from July 2010 until June 2011. Inclusion criteria are full term pregnant women with and without PROM. After the diagnosis is confirmed as PROM, mothers blood was taken from mediana cubiti venous to check the vitamin C level and leucocytes in mothers serum. Pregnancy with complication is the exclusion criteria.

Result: There were 52 subjects that fulfilled the acceptance and rejection criteria after divided into 2 groups, the 1st group was with PROM and the 2nd groups were normal. Based on the laboratory examinations, the mean of vitamin C levels in PROM groups is 0.731 ± 0.182 µg/dl and the normal groups is 0.722 ± 0.169 µg/dl, there is no significant difference (p=0.852). Leucocyte examination was done to know whether there was infection or not. The mean value from the PROM groups is 14330.77 ± 6552.90 µg/dl. And from the normal groups is 12973.08 ± 4160.24 µg/dl, there is significant difference (p=0.377).

Conclusion: There is no significant difference of Vitamin C level between maternal plasma with PROM and the one without PROM.

[Indones J Obstet Gynecol 2011; 35-4:173-5]

Keywords: PROM, normal pregnancy, vitamin C

Abstrak

***Tujuan**: Untuk membandingkan kadar vitamin C pada ibu hamil cukup bulan dengan ketuban pecah dini (KPD) dan kehamilan normal.*

***Metode**: Penelitian ini merupakan penelitian potong lintang. Dilakukan dari bulan Juli 2010 sampai Juni 2011. Kriteria inklusi ibu hamil cukup bulan dengan KPD dan tanpa KPD. Di mana setelah ditegakkan KPD, darah ibu diambil dari vena mediana kubiti untuk dilakukan pengukuran kadar vitamin C dan jumlah leukosit pada serum ibu. Kehamilan dengan komplikasi merupakan kriteria eksklusi.*

***Hasil**: Terdapat 52 subjek yang memenuhi kriteria penerimaaan dan penolakan kemudian dibagi 2 kelompok yaitu kelompok satu adalah KPD dan kelompok dua adalah normal. Berdasarkan pemeriksaan laboratorium, didapatkan rerata kadar vitamin C pada kelompok KPD sebesar 0,731 ± 0,182 µg/dl, pada kelompok normal sebesar 0,722 ± 0,169 µg/dl, tidak ada perbedaan bermakna (p= 0,852). Pemeriksaan leukosit dilakukan dengan tujuan mengetahui ada atau tidaknya infeksi pada subjek penelitian, didapatkan kadar rerata leukosit pada kelompok KPD sebesar 14330,77 ± 6552,90 µg, pada kelompok normal sebesar 12973,08 ± 4160,24 µg, tidak ada perbedaan bermakna (p=0,377).*

***Kesimpulan**: Tidak didapatkan perbedaan bermakna antara kadar vitamin C pada serum ibu hamil dengan KPD dan kadar vitamin C pada serum ibu hamil tanpa KPD.*

[Maj Obstet Ginekol Indones 2011; 35-4:173-5]

***Kata kunci**: ketuban pecah dini, kehamilan normal, vitamin C*

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INTRODUCTION

Premature rupture of the membranes (PROM) is one of many problems in Obstetric that is rather difficult to handle and often happen in this field because PROM can increase the morbidity and mortality in mother and baby.[1] PROM is connected with mechanism trauma and biochemistry process. PROM mean numbers in the world is 0.7% - 3.5% from all birth. The incidence in South Nigeria is about 2.5%.[2]

Cause of PROM is multifactorial. Inadequate availability of Vitamin C during pregnancy has been proposed as a risk factor for premature rupture of the membranes. Vitamin C is involved in the synthesis and degradation of collagen and is important for maintenance of the chorioamniotic membrane.[3]

METHODS

This study is cross sectional study. This study was done in the delivery room and obstetric and gynecology Emergency room in RSMH/Medicine Faculty of Sriwijaya University, Palembang. For 1 year from July 2010 until July 2011 or the sample were fulfill.

The subjects for this study were patients that fullfilled the inclusion criteria which is mother with PROM after 37 weeks pregnant.

The acceptance cases criteria: fullterm pregnancy (primigravida and multigravida), PROM, alive baby, normal delivery. Pregnancy with complication is the exclusion criteria.

Blood sample was taken from mediana cubiti venous as much as 3 ml, 2 ml of blood was taken to the biochemistry laboratory and 1 ml was taken for leucocyte counts to the RSMH laboratories.

RESULT

Data Analysis, data study were collected in form. The data were statistically calculated wth simple linear regression and the correlation was analyzed with SPSS Version 15.0. This study was done from June 2010 until July 2011, divided into 2 groups, 26 PROM and 26 normal. Characteristics distribution of this study is show completely in Table 1.

Table 1. Broad characteristic scattered.

Characteristics of the mother	PROM		Normal	
	N	%	N	%
Age				
> 20	1	50.0	1	50.0
20 - 35	20	47.5	22	52.5
> 35	25	62.5	3	37.5
Education				
Elementary school	2	100	0	0.0
Middle high school	3	100	0	0.0
High school	21	44.5	26	55.5
Job				
Housewive	26	100	26	100
Parity				
1	9	53.0	8	47.0
2	11	52.0	10	21.0
3	3	50.0	3	48.0
4	1	33.5	2	50.0
5	1	33.5	2	66.5
6	1	50	1	50.0
Total	52	100.0	52	100.0

Table 1 shows that subjects number in age range from 20-35 years old, for PROM groups is 20 subjects (47.5%) and for the normal group 22 subjects (52.2%) there is significant difference (p=0.734). In normal group there are more high school graduates, 21 subjects (44.5%) than in PROM group with (p=0.063). Parity is more in PROM which is 11 subjects than in normal group which is 10 subjects, with (p=0.0979). Vitamin C level in both groups can be seen in Table 2.

Table 2. Vitamin C level in fullterm pregnant women with and without PROM.

Variable	PROM Group Mean ± SB	NORMAL Group Mean ± SB
Vitamin C Level	0.731 ± 0.182	0.722 ± 0.169

T test SB: Deviation standard

Based on laboratory test, the mean of vitamin C level in PROM group is 0.731 ± 0.182 µg/dl and in normal group is 0.722 ± 0.169 µg/dl, there is no significant difference in both groups.

Table 3. Leucocytes level in both group can be seen.

Variable	PROM Group Mean ± SB	NORMAL Group Mean ± SB
Leucocytes level	14330.77 ± 6552.90	12973.08 ± 4160.24

T test SB: Deviation standard

In Table 3 Leucocytes examination was done to know if there was any infections in patients, mean level of leucocytes level in PROM groups is 14330.77 ± 6552.90 and in normal groups is 12973.08 ± 4160.24, there is no significant difference in both groups.

DISCUSSION

Subjects number of age range 20-35 years old in PROM groups is 20 subjects (47.5%) and in normal group is 22 subjects (52.5%). Mean of subjects age in this research is not far the result from Casanuevs et al, it has been known that PROM happens mostly in pregnant women aged 27.4 ± 7.7 years old.[3] And Osaikhuwuomwan research reported that the mean of pregnant women with PROM 28.25 ± 3.74 years old.[2]

Mean subject in this study with PROM happened mostly in parity two (53%). Research from Osaikhuwuomwan et al with PROM reported that happened in parity 1.53 ± 0.51.[2]

Vitamin C level and pregnant women

Based on laboratory examination, we found that vitamin C level in PROM group mean level is 0.731 ± 0.182 µg/dl and in normal group 0.722 ± 0.169 µg/dl, there is no significant difference in both groups. In Osaikhuwuomwan et al, there is significant difference between group with PROM and without PROM, in PROM groups is 0.58 µg/dl. Difference was caused by difference of samples.

Because the samples from Osaikhuwuomwan et al were 24 - < 37 weeks gestational age.[2]

Vitamin C roles in collagen metabolism are as mechanics chorionic amnion membranes during pregnancy and also as collagen prost transcriptional modificator. Changes in collagen synthesis and lower vitamin C concentration in 28 weeks gestational age are linked with PROM.[4-8]

Casanueva et al reported that 100 mg vitamin C/day was added in daily diets to reach the ascorbic leucocytes level > 18 mg (102 mol)/108 cells and concentration in this level is important to prevent PROM.[3,9-13]

CONCLUSION

Vitamin C level in women with PROM > 0.731 ± 0.182 µg/dl compare with 0.722 ± 0.169 µg/dl in normal groups. There is significant difference.

SUGGEST

Vitamin C supplementation with enough dosage is involved in the synthesis and degradation of collagen

type I and II and is important for maintenance of the chorioamniotic membrane. The next studies with the better methods are still needed.

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