Research Report

Serum Magnesium Ion Content in 32-36 Weeks Preterm Labor Patients in Dr. Mohammad Hoesin Hospital Palembang

Kadar Magnesium Serum pada Pasien Persalinan Prematur Usia 32-36 Minggu di Rumah Sakit Umum Dr. Mohammad Hoesin Palembang

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Abstract

Objective: To determine the average levels of serum magnesium in 32-36 weeks of preterm labor patients and to compare the average of serum level of magnesium serum in preterm delivery 32-36 weeks with an average content of magnesium ions in normal delivery.

Methods: The study is an observational descriptive cross-cut design to determine level of magnesium serum at 32-36 weeks of preterm labor.

Result: Samples of this study were patients with preterm labor who were treated at the Department of Obstetrics and Gynecology in Dr. Mohammad Hoesin Palembang from January 1st, 2009 until July 31st, 2010. The number of samples was 33 subjects. Most subjects were in the range of 20-35 years of age. The largest parity in the preterm group was 0, namely 14 subjects (42.5%), while in the normal pregnancy group it was 1, viz. 12 subjects (36.4%).

Conclusion: Based on the results of studies, the magnesium levels of 32-36 weeks preterm labor group was lower than the normal delivery group. The average of magnesium level in preterm labor group was 1.57 ± 0.18, while in the normal delivery group, it was 1.88 ± 0.23. There was a statistically significant difference found on magnesium levels in both groups ($p < 0.05$).

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Keywords: serum magnesium, preterm

Abstrak

***Tujuan**: Untuk mengetahui rata-rata kadar ion magnesium serum pada persalinan preterm 32-36 minggu. Membandingkan rata-rata kadar magnesium serum pada persalinan preterm 32-36 minggu dengan rata-rata kadar ion magnesium pada kehamilan normal.*

***Metode**: Merupakan observasional deskriptif dengan rancangan potong silang untuk mengetahui kadar magnesium serum pada persalinan preterm 32-36 minggu.*

***Hasil**: Sampel penelitian ini adalah pasien dengan persalinan preterm yang dirawat di Departemen Obstetri dan Ginekologi RSMH Palembang dari 1 Januari 2009 sampai dengan 31 Juli 2010. Jumlah sampel adalah 33 subjek. Subjek terbanyak terdapat pada kisaran umur 20-35 tahun, Paritas terbesar pada kelompok preterm adalah paritas 0 yaitu 14 subjek (42,5%) sedangkan pada kelompok hamil normal adalah paritas 1 yaitu 12 subjek (36,4%).*

***Kesimpulan**: Berdasarkan hasil penelitian kadar magnesium kelompok preterm 32-36 minggu lebih rendah dibandingkan dengan kelompok hamil normal. Rerata kadar magnesium serum pada kelompok preterm 32-36 minggu sebesar 1,57 ± 0,18 sedangkan pada kelompok hamil normal sebesar 1,88 ± 0,23. Sudah terbukti secara statistik terdapat perbedaan bermakna antara kadar magnesium serum pada kedua kelompok tersebut ($p<0,05$).*

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***Kata kunci**: magnesium serum, preterm*

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INTRODUCTION

Preterm labor is a labor that occurs between 20-36 weeks gestation or less than 256 days from the first day of last menstrual period.[1,2] This is a problem that often occurs in the obstetrics. Of all births in the world, preterm labor occurs about 6-10%. It is a serious concern because it contributes to infant mortality that is quite high, while infant mortality is one of the standards of the international quality health care systems.[1,3,4]

METHOD

This is a descriptive observational study with cross-cut design to determine levels of magnesium serum at 32-36 weeks of preterm labor. Sampling was conducted at Dr. Mohammad Hoesin Hospital Palembang, from January 1st, 2009 until July 31st, 2010. The population was the 33 patients with 32-36 weeks preterm labor who were treated in the hospital. Inclusion criteria were pregnant women, healthy and had adequate nutrition, single pregnancy, 32-36 weeks gestation age, tocolytic index of less than 8 or already inpartu, parity <5. Exclusion criteria were no pregnancy, pregnancy with congenital abnormalities, pregnancy with medical complicatserum, such as heart disease, lung disease, diabetes, infectious diseases, kidney failure, fetus death in the womb of preeclampsia/eclampsia; premature rupture of membranes; multiple pregnancies; and no willingness to participate in the study.

To examine the subjects that met the inclusion criteria, the followings were conducted. First, the subjects were interviewed about the identity, and history of pregnancy and diseases. Next, a general examina-

tion, maternal vital signs, weight, physical examination, and blood and urine check were done. Routine obstetric examination was made which includes an inside and outside complete inspection. For further evaluation, internal exam was not conducted unless there were certain indicatserum. The assessment of tocolytic index was done with the reference that if the total score is > 8, it meant a contra indication toward tocolytic.

Blood sampling to check levels of magnesium ions with a colorimetric method (Xylidil blue-reaction) in laboratory Prodia Palembang branch was carried out as follows: Blood samples were taken from venous blood cubiti ± 5 ml. The tubes were labeled with names and ages.

Samples were stored at a room temperature (2 x 24 hours at the most) then transferred to Prodia laboratory Palembang (samples were delivered by the researcher).

Patients diagnosed with preterm labor were briefed about the study and its management procedures and then asked her consent to participate in this study (Informed Consent). The data obtained were presented in narrative and tabulation. The average levels of magnesium serum in preterm labors were compared to the average of magnesium serum level in a normal pregnancy with t test.

RESULTS AND DISCUSSION

The cause of preterm labour is still unknown. The role of magnesium is also not clear. Recently, involvement of magnesium in physiological and pathological process of labour has been clearly demonstrated.[4,5] In this study the number of samples that met the inclusion criteria and then participated was 66 subjects, which were divided into 2 groups: group of preterm labor and normal pregnancy with 33 subjects each. The average of 32-36 weeks preterm labor subject's age was 25.33 ± 5.90 years, and the average of normal pregnancy subject's age was 27.36 ± 4.93 years. Most subjects were in the range of 20-35 years of age, which consisted of 25 subjects (75.7%) in the preterm group and 29 subjects (87.8%) in normal pregnancy group. There was no statistically significant difference in t-test of the subjects' age in both groups (p = 0.999). The largest parity in the preterm group was 0 for 14 subjects (42.5%), whereas in the normal pregnancy group, it was 1 for 12 subjects (36.4%). Most subjects were housewives, namely 22 subjects (66.7%) in preterm group and 23 subjects (69.6%) in normal pregnancy group. There were only four subjects (12.1%) in preterm group and 3 subjects (9.1%) in normal pregnancy group who worked in private companies. The average of gestational age in preterm group was 35.27 ± 0.84 weeks and in normal pregnancy group was 35,24 ± 0,86 weeks. This conforms to the inclusion criteria applied previously which was between 32-36 weeks. Statistical tests showed no significant differences in gestational age in both groups (p = 0.866). All subjects in each group had no history of previous preterm delivery.

Based on the results of study, the magnesium levels of 32-36 weeks preterm group was lower than the normal pregnancy group. The average of magnesium level in preterm group was 1.57 ± 0.18, and in the normal pregnancy group was 1,88 ± 0,23. It's been proven statistically that there was a significant difference of magnesium levels found in both groups (p <0.05). The mean of magnesium level and its distribution in both groups can be seen in Table 1 and Figure 1.

Table 1. The average of magnesium levels in both groups

Variable	Preterm (mean ± SD)	Normal pregnant (mean ± SD)	p
Magnesium	1.57 ± 0.18	1.88 ± 0.23	0.001

SD = standard deviation

The result showed a significant correlation of high levels of magnesium with the incidence of preterm in which the correlation value was 0.620 with p value = 0.001. Figure 2 shows the movements from lower left to upper right which indicates an increase in magnesium levels in normal pregnancy group.

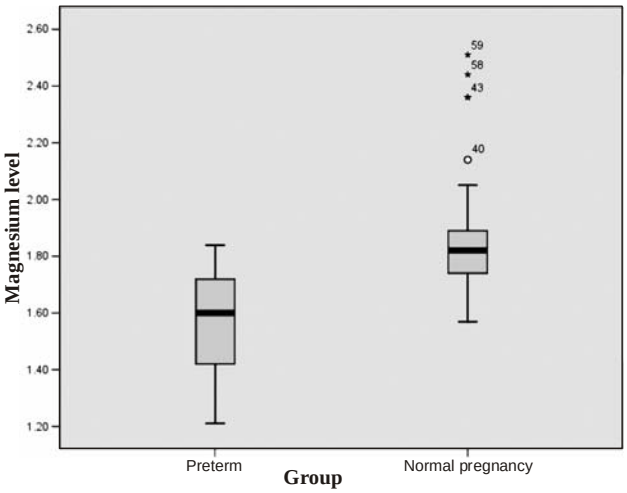

Figure 1. Distribution of magnesium levels in both groups

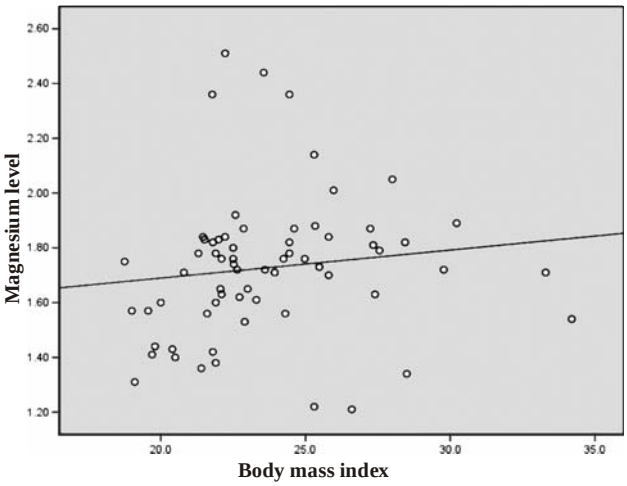

Figure 2. The correlation of magnesium levels in 32-36 weeks preterm labor group and normal pregnancy group.

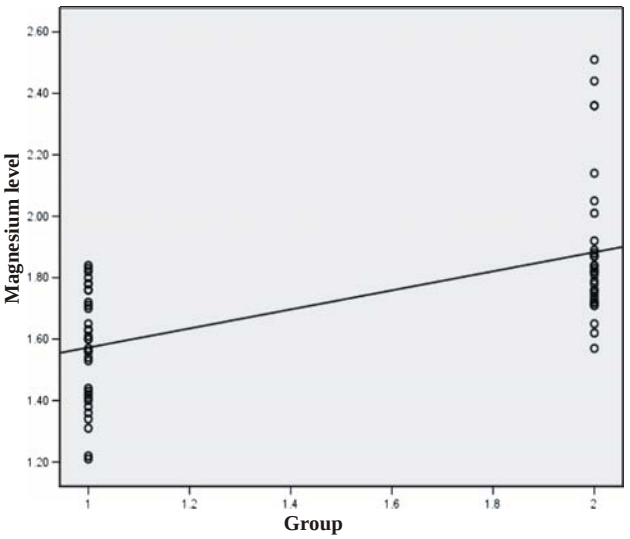

Figure 3. The correlation of magnesium levels with body mass index

Pearson correlation analysis showed no significant correlation between high levels of magnesium and body mass index in which the correlation value is 0.126 with p value = 0.313. However, Figure 3 shows that the curve moves from lower left to upper right which indicates that the higher the person's body mass index is, the higher its magnesium content will be.

Past studies and reports have appeared showing a decreased level of serum magnesium in preterm labour. The present study has dealt with the concentration of serum magnesium in significant number of patients with preterm labour that is suppose to play an important role on the etiology of preterm labour if the serum magnesium level is low.[5]

In our study, serum magnesium level were estimated in 33 patients with preterm labour and 33 patients with normal pregnancy. It was found that serum magnesium level to be significantly reduced in the cases of preterm labour. Therefore the finding in our study demostrated that serum magnesium concentration is decreased in preterm labour. In this study the mean magnesium was 1.57 0.18 for the patient with preterm labour and 1.88 ± 0.23 for the normal pregnancy group. The mean difference was found to be statistically significant ($p<0.05$). In two other studies, the serum magnesium level in preterm labour were less than 1.9 mg/dl and 1.4 mg/dl.[6,7] In a study, serum magnesium level was also found to be low in patients belonging to low socioeconomic status, thus relating the low level of magnesium to diet deficient in magnesium.[8,9] A case control study was carried out by Begum (2010) serum magnesium levels in preterm labour were 2.02 ± 0.20 and 1.65 ± 0.19 mg/dl, respectively, in control and case groups.[10] In a study carried out by Puspo and Jagdish (1990) serum magnesium level in preterm labour was found to be 1.67 ± 0.23 mg/dl.[11] In a study, serum magnesium level was associated with preterm birth OR: 0.75, CI 95%. Sensitivity, specificity, positive and negative predictive value of serum magnesium for preterm birth was 95,50,66.5 and 83.33% respectively.[12] In a study carried out by Pathak (2003) a high prevalence of magnesium deficiency was found among the pregnant women in a rural community of Haryana state (India).[13] In a study carried out by Roszyk (1996) a significant decrease of magnesium concentrations was found in the first period of parturition as compared with the imminent and normal pregnancies of the first and second trimester.[14]

All above studies showed that hypomagnesaemia may be a risk factor for preterm labour or may be used as a predictor of preterm labour.

CONCLUSION

The average of magnesium level in preterm group was 1.57 0.18, and it is lower than the average in the normal pregnancy group 1.88 ± 0.23. There was statistical difference and correlation of magnesium levels in preterm group compared to normal pregnancy group.

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