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Original Research Article**DOI: <http://dx.doi.org/10.22192/ijcrbm.2018.03.01.017>****Evaluation of diagnostic value of amniotic fluid CRP and its relation to the pregnancy complications****Khadije Rezaie Keikhaie¹, Abolfazl Karimzade² Forough Forghani¹,
Leili Rezaie Keikhaie³**¹ Assistant Professor of Maternal Fetal Medicine, Department Obstetrics and Gynecology, Maternal and Fetal Health Research Center, Zabol University of Medical Sciences, Zabol, Iran² Medical Student, Student Research Committee, zabol University of Medical Sciences, Zabol, Iran³ Zabol University of Medical Sciences, Zabol, Iran***Corresponding author: Leilirezaie Keikhaie : Zabol University of Medical Sciences, Zabol, Iran**

Abstract

Introduction:

The health of the child is in close relation with the health of the mother and her access to health care. Among these services, it is possible to perform prenatal care with the aim of identifying risk factors and predicting and preventing pregnancy complications. One of the complications of preterm labor is premature delivery and one out of each ten births are preterm. Low birth weight is another complication of pregnancy; the death rate of LBW infants is 4 to 8 times more than healthy infants.

Methodology

This descriptive-analytic study was performed on all pregnant women referring to the clinic of Amiral-Momenin Hospital in Zabol in 2017; pregnant mothers with gestational age more than 20 weeks, single-strike pregnancy and satisfaction to enter the study were the main inclusion and proven systemic infections, diabetes, hypertension, pre-pregnancy, internal disease, mental illness, smoking, non-Iranian nationality, Corticosteroids consumption and immune stimulants in the last 4 weeks and the use of Non-steroidal anti-inflammatory medicines were the main exclusion criteria.

Results:

Based on the results of the present study, the mean CRP level of women with preeclampsia turned out to be 11 ± 4.35 ; the mean CRP level of women with preeclampsia was significantly higher than that of healthy pregnant women. Based on the results of the present study, the mean CRP level of women with diabetes turned out to be 2.57 ± 0.93 ; the mean CRP level of women with diabetes was not significantly different from that of healthy pregnant women. Based on the results of the present study, the mean CRP level of women with oligohydramnios turned out to be 2.25 ± 0.95 ; the mean CRP level of women with oligohydramnios was not significantly different from that of healthy pregnant women.

Discussion and conclusion

In general, the results of this study showed that the mean CRP level in women with preeclampsia and premature rupture of membrane was significantly higher than healthy women without complications of pregnancy; however, ferritin in the other complications of pregnancy, including Gestational diabetes, fetal abnormalities, placental abruption, and oligohydramnios were not statistically different with healthy pregnant women.

Keywords: CRP, amniotic fluid, pregnancy

Introduction

The health of the child is in close relation with the health of the mother and her access to health care. Among these services, it is possible to perform prenatal care with the aim of identifying risk factors and predicting and preventing pregnancy complications (1,2). One of the complications of preterm labor is premature delivery and one out of each ten births are preterm (3). Low birth weight is another complication of pregnancy; the death rate of LBW infants is 4 to 8 times more than healthy infants (4-7). According to the latest available statistics, the prevalence of low birth weight in our country is 10% and its prevalence in urban areas of Isfahan province was 6.4% and 7.4% in rural areas in the first six months of the year (8-10). Eclampsia and preeclampsia are other complications which might develop during pregnancy. Annually, around 50,000 women worldwide die from pregnancy due to hypertension, and close to the same number due to complications of preeclampsia, such as brain hemorrhage, kidney failure and other cases and the number of patients developing serious complications is much higher than the actual mortality rate of the disease (11). Preeclampsia is one of the complications of pregnancy and is known as the main cause of morbidity and maternal mortality (12). The prevalence of preeclampsia, which is characterized by hypertension and protein excretion in the urine after 20 weeks, is about 4-5%. In case of the development of seizures or hemolysis, increased liver enzymes and platelet counts (hale syndrome), preeclampsia can cause eclampsia (13). Several studies have been conducted on the diagnostic tests of preeclampsia; however, there is currently no reliable, valid and

economical screening test for preeclampsia, and preeclampsia can only be diagnosed through planned pre-natal care. The first step in preventing pregnancy complications is the early identification of women at risk and treatment for these women during prenatal care; therefore, a proper diagnostic and screening test that is inexpensive and useful for all pregnant women is necessary.

Methodology

This descriptive-analytic study was performed on all pregnant women referring to the clinic of Amiral-Momenin Hospital in Zabol in 2017; pregnant mothers with gestational age more than 20 weeks, single-strike pregnancy and satisfaction to enter the study were the main inclusion and proven systemic infections, diabetes, hypertension, pre-pregnancy, internal disease, mental illness, smoking, non-Iranian nationality, Corticosteroids consumption and immune stimulants in the last 4 weeks and the use of Non-steroidal anti-inflammatory medicines were the main exclusion criteria. The collected data was analyzed using SPSS18 and descriptive statistics in form (frequency tables and charts). To determine the relationship between CRP, LDH and ferritin with pregnancy complications, logistic regression and ROC curve models were used with a significant level of 5%.

Findings

The present study was conducted on 100 pregnant women referring to the clinic of Amiral-Momenin Hospital in Zabol in 2017; the mean age of studied subjects turned out to be 29.86 ± 6.22 years.

Table 1. Comparison of mean CRP level in pregnant women with preeclampsia and eclampsia and healthy subjects

Group	CRP	P value
Positive preeclampsia	11 ± 4.35	0<0001
Negative preeclampsia	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with preeclampsia turned out to be 11 ± 4.35 ; the mean CRP level of women with

preeclampsia was significantly higher than that of healthy pregnant women.

Table 2. Comparison of CRP Mean in Pregnant Women with and without Gestational Diabetes

Group	CRP	P value
Positive diabetes	2.57 ± 0.93	0.610
Negative diabetes	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with diabetes turned out to be 2.57 ± 0.93 ; the mean CRP level of women with

diabetes was not significantly different from that of healthy pregnant women.

Table 3. Comparison of mean CRP in pregnant women with and without oligohydramnios

Group	CRP	P value
Positive oligohydramnios	2.25 ± 0.95	0.778
Negative oligohydramnios	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with oligohydramnios turned out to be 2.25 ± 0.95 ; the mean CRP level of women with

oligohydramnios was not significantly different from that of healthy pregnant women.

Table 4 - Comparison of the mean CRP in pregnant women with and without placental abruption

Group	CRP	P value
Positive placental abruption	2 ± 1.41	0.605
Negative placental abruption	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with placental abruption turned out to be 2 ± 1.41 ; the mean CRP level of women with

placental abruption was not significantly different from that of healthy pregnant women.

Table 5. Comparison of mean CRP in pregnant women with and without fetal abnormalities

Group	CRP	P value
Positive fetal abnormalities	3.33 ± 1.52	0.311
Negative fetal abnormalities	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with fetal abnormalities turned out to be 3.33 ± 1.52 ; the mean CRP level of women

with fetal abnormalities was not significantly different from that of healthy pregnant women.

Table 6. Comparison of mean CRP in pregnant women with and without premature rupture of membrane

Group	CRP	P value
Positive premature rupture of membrane	10.18 ± 2.52	$0 < 0001$
Negative premature rupture of membrane	2.40 ± 1.07	

Based on the results of the present study, the mean CRP level of women with premature rupture of membrane turned out to be 88.90 ± 15.32 ; the mean

CRP level of women with premature rupture of membrane was significantly different from that of healthy pregnant women.

Table 7. Comparison of mean ferritin level in pregnant women with preeclampsia and eclampsia and healthy subjects

Group	ferritin	P value
Positive preeclampsia	92.25±14.81	0<0001
Negative preeclampsia	37.48±13.29	

Based on the results of the present study, the mean ferritin level of women with preeclampsia turned out to be 92.25±14.81; the mean ferritin level of women

with preeclampsia was significantly higher than that of healthy pregnant women.

Table 8. Sensitivity, specificity, positive and negative predictive value of CRP

Complication	Sensitivity	Specificity	Positive predictive	Negative predictive value
Preeclampsia and eclampsia	100%	70.2%	39%	100%
Gestational diabetes	14%	54.6%	4.8%	79.6%
PPROM	100%	66.2%	26.8%	100%
oligohydramnios	0	57.2%	.	100%
placental abruption	0	58.1%	0	100%
Fetal abnormalities	33.3%	58.7%	2.4%	96.6%

Discussion and Conclusion

The health of the child is in close relation with the health of the mother and her access to health care. Among these services, it is possible to perform prenatal care with the aim of identifying risk factors and predicting and preventing complications of pregnancy(14-16).The aim of this study was to evaluate the diagnostic value of amniotic fluid lactate dehydrogenase and its relationship with pregnancy complications in pregnant women with gestational age greater than 20 weeks referred to the clinic of Amir-al-Mu-menin Hospital in Zabol in 2017.The mean age of studied subjects turned out to be 29.86±6.22 years.The mean CRP level in women with preeclampsia was 11±4.35, which turned out to be significantly higher than healthy pregnant women. The mean CRP level in women with gestational diabetes mellitus was 2.57±0.93, but the mean of pregnant women with diabetes mellitus was not significantly different from healthy subjects. The mean CRP level in women with oligohydramnios was 2.25±0.95, but. The mean CRP level in women with placental abruption was 2±1.41, but it was not significantly different from healthy subjects. The mean CRP level in women with fetal abnormality was 3.33±1.52, it was not significantly different from healthy subjects. The mean CRP level in women with premature rupture of the membrane was 10.18±2.52, which turned out to be significantly different from the control group. The results of

Roghieh Hosseiniyan Kendzar et al study, which was conducted in order to investigate the relationship between CRP levels and PPRM in Tehran, indicated that 11 (6.2%) of 418 pregnant women reported having PPRM with a serum CRP level, which turned out to be significantly higher than healthy subjects without PPRM (8.2 ± 5.22 mg / dl and 5.4 ± 7.8 mg / dl) (17-19).

In general, the results of this study showed that the mean CRP level in women with preeclampsia and premature rupture of membrane was significantly higher than healthy women without complications of pregnancy; however, ferritin in the other complications of pregnancy, including Gestational diabetes, fetal abnormalities, placental abruption, and oligohydramnios were not statistically different with healthy pregnant women.

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