# SERUM LEVELS OF ACTIVE COMPLEMENT C3 AND C4 IN PRE- ECLAMPTIC AND NORMOTENSIVE CASES AND THEIR CORRELATION TO FETAL AND MATERNAL OUTCOME

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## Introduction

Preeclampsia is a syndrome diagnosed by hypertension and proteinuria after 20 weeks of gestation; it affects 5–10% of all pregnancies and remains a leading cause of maternal and fetal morbidity and mortality. Based on clinical presentation, preeclampsia is considered as a late pregnancy disorder, but the molecular events leading to its onset seem to occur early in pregnancy. The early phase of the disease is characterized by suboptimal placentation and hemodynamic maladaptation to the pregnancy while at later stages generalized vascular dysfunction leading to clinical syndrome of preeclampsia, Maternal symptoms of preeclampsia are considered consequences of placental pathology associated with poor placental perfusion, inflammation and ischemia / hypoxia, trophoblast damage and activation of complement pathways either classical or alternative pathway. The activation of the complement system plays an important role both in maintaining normal pregnancy and in the pathogenesis of pre-eclampsia, activation of both classical and alternative pathways plays an important role in cleaning up the numerous trophoblastic cell fragments formed during the placental establishment process. If the complement system is over activated, however, the activating complement component C3a and C4a can activate a maternal systemic inflammatory response, leading to the corresponding manifestations of preeclampsia.

## Aim of the work

The primary aim of this study was to evaluate serum levels of activated complement C3, C4 and C-reactive protein in cases of mild and severe preeclampsia and to compare the result with normotensive cases.
And to correlate the levels of the active complement C3, C4, and CRP in these cases to the outcome fetomateral and development of complications.

## Subjects and Methods

The patients were recruited from El-Shatby Maternity University Hospital. They were divided into three groups, group (I): thirty five severe preeclampsia patients, group (II): thirty five mild preeclampsia patients and group (III): thirty five normal pregnant women.
All patients (n=105) underwent complete history taking, clinical examination, ultrasound examination for fetal biometry, mean gestational age, amount of liquor , and estimate fetal weight by US.
Laboratory investigations were carried out including complete blood count, liver function tests, renal function tests, and serum level of C3, C4, and CRP level in severe and mild preeclampsia and normotensive pregnant women at third trimester and to correlate level of those parameters with severity of preeclampsia, fetal and maternal outcome.

## Results

The mean for maternal serum level of C3 and C4 in severe preeclampsia group was significantly high in comparison to normotensive group and mild preeclampsia group and there was correlation and statistical significance between C3and maternal outcomes mainly with development of HELLP syndrome Cut off point of C3 on ROC curve for diagnosis of severe preeclampsia was >1.8g/l with sensitivity 74.29% and specificity 71.43% while Cut off point of C4 on ROC curve for diagnosis of severe preeclampsia was >0.2g/l with sensitivity 77.14% and specificity 65.71%

**Table:** Comparison between the three studied groups according to C3, C4 and CRP parameters

| | Severe (n = 35) | Mild (n = 35) | Control (n = 35) | p |
|---|---|---|---|---|
| **C3 (g/l)** | | | | |
| Min. – Max. | 1.23 – 3.77 | 1.28 – 1.98 | 0.75 – 1.61 | <0.001* |
| Mean ± SD. | 2.03 ±0.49 | 1.73 ±0.16 | 1.26 ±0.24 | |
| **Sig. bet. grps.** | $p_1$=0.001*,$p_2$<0.001*,$p_3$<0.001* | | | |
| **C4 (g/l)** | | | | |
| Min. – Max. | 0.10 – 0.81 | 0.07 – 0.35 | 0.07 – 0.22 | <0.001* |
| Mean ± SD. | 0.32 ±0.17 | 0.18 ±0.07 | 0.15 ±0.04 | |
| **Sig. bet. grps.** | $p_1$<0.001*,$p_2$<0.001,$p_3$=0.626 | | | |
| **CRP ( mg/l)** | | | | |
| Min. – Max. | 3.11 – 127.0 | 1.35 – 125.0 | 1.15 – 115.0 | 0.090 |
| Mean ± SD. | 37.29 ±32.65 | 28.76 ±35.85 | 19.19 ±22.77 | |

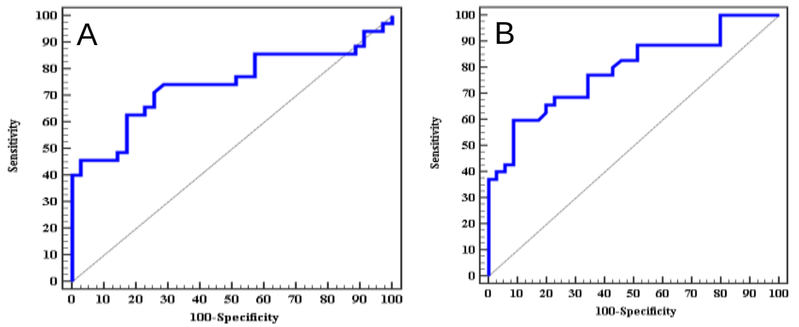


**Figure 1: A:** Cut off point of C3 on ROC curve for diagnosis of severe preeclampsia was >1.8g/l
. **B:** Cut off point of C4 on ROC curve for diagnosis of severe preeclampsia was >0.2g/l

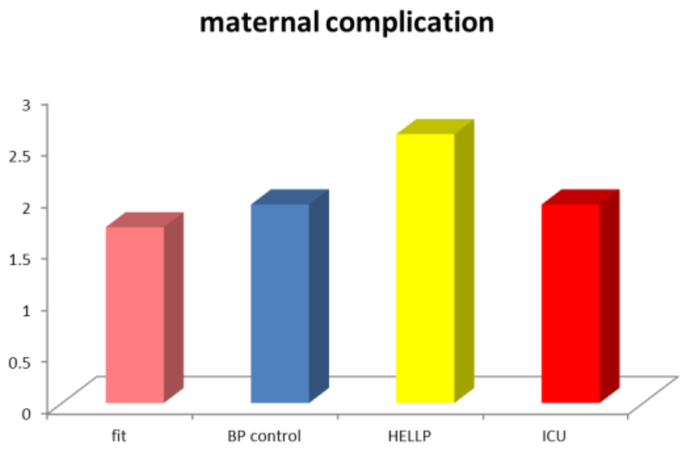


**Figure 2:** Relation between maternal complication and C3 in sever preeclampsia group

## Conclusion

From this study we found that aberrant regulation of the complement system C3 and C4 through the alternative and classical pathways was play important role in patients with preeclampsia later in pregnancy. The plasma level of C3 and C4 in preeclampsia women was significantly high when compared to normotensive pregnant women