



A COMPARATIVE STUDY OF PREGNANCY ASSOCIATED PLASMA PROTEIN-A IN THIRD TRIMESTER OF NORMAL PREGNANCY WITHOUT PREECLAMPSIA AND PREGNANCY WITH PREECLAMPSIA

Biochemistry

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ABSTRACT

Human placenta produces a wide variety of specific proteins, One of them is pregnancy-associated plasma protein A (PAPP-A). The aim of this study was comparison of serum level of PAPP-A in third trimester of normal pregnancy without preeclampsia and pregnancy with preeclampsia. In this study, 250 normal pregnant females without preeclampsia and 250 cases of preeclampsia were evaluated. They were compared for serum PAPP-A. The mean age was not statistically different between two groups ($p=0.2564$). Preeclamptic pregnant females showed a non-significant relationship in serum PAPP-A levels when the results were compared with normal pregnant females without preeclampsia.

KEYWORDS

PAPP-A, Trimesters, Preeclampsia

INTRODUCTION

Preeclampsia [PE] is a multisystem disorder of pregnancy of unknown etiology which is characterized by hypertension (Blood Pressure $>140/90$ mmHg) with proteinuria (urinary protein excretion of >300 mg/L in 24hr specimen) after 20 weeks of gestation in previously normotensive, non-proteinuric pregnant women. [1]

Pregnancy associated plasma protein A (PAPP - A) is a key regulator of insulin like growth factor. Its bioavailability is essential for normal fetal development. In maternal blood, this protein increases with gestational age and then decreases rapidly after delivery. It belongs to a group of biomarkers that predict later preeclampsia development, primarily early onset preeclampsia. [2]

PAPP-A exists in pregnancy serum as a heterotetrameric 2 : 2 complex with the proform of eosinophil major basic protein (proMBP), forming an approximately 500 kDa and called PAPP-A/proMBP.[3] In non-pregnancy individuals PAPP-A is found as a 400 kDa homodimer. [4]

Therefore the present study was conducted to evaluate the role of PAPP-A in third trimesters of preeclamptic patients with an aim to explore utility of this parameter in pathogenesis of complications and better management of preeclamptic pregnancy.

Pathophysiology of Preeclampsia is poorly understood but multiple factors like maternal, paternal and fetal have been implicated in the development.

MATERIALS AND METHOD

The study was conducted on 250 pregnant females having preeclampsia attending the Ante Natal Clinic, department of Gynaecology and Obstetrics, Umaid Hospital for Women and Children and MDM Hospital, Jodhpur (Rajasthan). The results were compared with age matched 250 normal (healthy) pregnant females without preeclampsia. Subjects included in this study were in their third trimester of pregnancy.

A thorough clinical and symptomatic examination of all the patients was done under the guidance of the treating gynecologist and the evidences of symptoms to confirm the presence of preeclampsia were recorded in a proforma. The clinical course and the complications, if present, in relation to the disease were also recorded.

Test for Serum PAPP-A was carried out in the clinical laboratory of the Department of Biochemistry at Dr. S. N. Medical College, Jodhpur and Research laboratory, Dr. S. N. Medical College, Jodhpur

RESULTS

The present study had been conducted on 500 pregnant females of same age group (18-40 years), comprising of 250 clinically established preeclamptic pregnant females and equal number of normal pregnant women.

The mean Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) of the preeclamptic pregnant females was 141.60 ± 5.79 and 93.96 ± 6.49 mmHg respectively; which varies from 124.0 to 160.0 mmHg in SBP and from 84.0 to 116.0 mmHg in DBP. SBP and DBP was 120.63 ± 4.20 and 78.76 ± 4.39 mmHg in normal pregnant females which varies from 100.0 to 134.0 mmHg and from 60.0 to 86.0 mmHg respectively.

A statistically highly-significant difference ($p<0.0001$) was observed in SBP and DBP of preeclamptic pregnant females ($t = 46.313$ and 30.623 respectively) when results were compared with the normal pregnant females

The mean Serum PAPP-A of the preeclamptic pregnant females was 527.56 ± 171.40 μ g/mL; which varies from 123.52 to 1194.8 μ g/mL. It was 507.86 ± 105.34 μ g/mL in normal pregnant females without preeclampsia which varies from 225.8 to 768.8 μ g/mL. (Table 1).

A statistically non-significant difference ($p = 0.1223$) was observed in Serum PAPP-A of preeclamptic pregnant females ($t = 1.548$) when results were compared with the normal pregnant females without preeclampsia (Table 2).

Table 1: Mean Serum PAPP - A level (μ g/mL) of the subjects studied

Group studied	Serum PAPP-A (Mean \pm SD) [Range]
Preeclamptic Pregnant	527.56 ± 171.40 [123.52-1194.8]
Normal Pregnant	507.86 ± 105.34 [225.8-768.8]

Table 2: Statistical analysis of serum PAPP-A among the groups studied

Group Compared	t - value	p - value
Preeclamptic pregnant v/s Normal pregnant	1.548	0.1223 (NS)

DISCUSSIONS AND CONCLUSIONS:

In this study, Serum PAPP-A showed a non-significant relationship between both the groups studied.

Grill S *et al* (2009) [5] observed that there is decrease in levels of serum PAPP-A in preeclamptic pregnant as compared to healthy pregnant.

Atis A *et al* (2012) [6] was observed statistically significant difference when they compared mean serum PAPP-A levels in preeclamptic pregnant and normal pregnant. Serum PAPP-A levels was higher in pregnant women with preeclampsia.

Similar to our study, Jonathan L *et al* (2013) [7] observed that there is statistically non-significant difference when they compared serum PAPP-A levels in preeclamptic pregnant females (0.991 MOM) and normal pregnant females without preeclampsia (1.000 MOM).

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