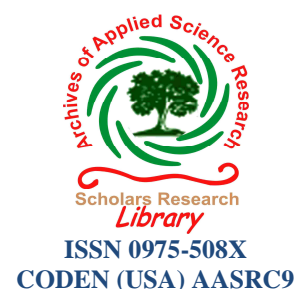




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Serum Adenosine Deaminase levels in Gestational Hyper Tension

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ABSTRACT

Serum adenosine deaminase (ADA) activity serve as marker of diseases with altered cell mediated immunity. Gestational hypertension is multi factorial disorder of pregnancy affecting health of mother and fetus. In this study serum ADA levels were measured in gestational hypertensive women to understand role of cell mediated immunity in pathogenesis of gestational hypertension. Serum ADA levels in 50 gestational hypertensive women and 30 normotensive pregnant women were measured. Serum ADA level in gestational hypertensive women was higher than the normotensive pregnant women (64.84 ± 12.76 v 45.03 ± 8.80 , $p < 0.001$). This findings suggest that cell mediated immunity increases in gestational hypertension.

Key words: Gestational hypertension Serum adenosine deaminase Normotensive Pregnancy Cell mediated immunity

INTRODUCTION

Adenosine deaminase (EC 3.5.4.4) catalyses the irreversible hydrolytic deamination of adenosine or deoxyadenosine to inosine or deoxyinosine respectively [1]. It is widely distributed in human tissues, especially in the lymphoid tissues and plays an important role in controlling the level of its substrates as both adenosine and 2'-deoxyadenosine exert a broad range of biological effects in a variety of systems[2,3]. The chief physiological function of ADA is related to lymphocytic proliferation and differentiation [4]. ADA deficiency is the cause of one form of SCID, in which there is dysfunction of both B and T lymphocytes with impaired cellular immunity [5]. The activity of ADA serve as marker and shows changes in diseases characterized by the alteration of cell-mediated immunity[6,7] . Further serum ADA levels are found to be altered in normal pregnancy due to changes in the immunological status that occurs throughout normal pregnancy [8].

Gestational hypertension occurs in about 6 percent of pregnancies[9]. Gestational hypertension is defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg in a previously normotensive pregnant woman who is ≥ 20 weeks of gestation and has no proteinuria and the blood pressure readings should be documented on at least two occasions at least six hours apart [10,11]. Gestational hypertension is multi factorial disorder associated with increased risk of maternal coronary artery disease and cesarean section, preterm delivery, and small for-gestational-age babies [12]. Hypertension, another multisystem disorder is associated with development of coronary artery disease [13]. Several studies implicate alterations in immune response are involved in pathogenesis of hypertension and atherosclerosis [14]. The exact pathogenesis of gestational hypertension is not yet fully understood. It has been suspected that maternal/fetal immune response genes may contribute to the development

[15]. In view of these to know role of immune response if any in the pathogenesis of gestational hypertension serum adenosine deaminase levels were determined in gestational hypertensive women.

MATERIALS AND METHODS

The present study was conducted in the department of Biochemistry (Central Laboratory) GSL Medical College and General Hospital.

Selection of groups

Two groups were included in the study.

Gestational hypertensive women

A total of 50 hypertensive pregnant women were taken up for the study with the ages 18-29 years. Only gestational hypertension patients were taken and the other types of hypertension in pregnancy like preeclampsia, chronic hypertension and preeclampsia superimposed on chronic hypertension were excluded in the present study.

Normotensive pregnant women

A total of 30 age matched normotensive pregnant women were studied. They were defined as having a subjective perception of good health as determined by health questionnaire.

Collection of Blood Samples

5 ml of venous blood was collected. The blood pressure was measured in all subjects as per the recommendations of NHBPEP(2000). Serum was separated and used for adenosine deaminase estimation.

Serum ADA activity

Serum ADA level was measured using a commercial Microxpress ADA-MTB reagent kit with instructions provided by manufacturer. ADA releases ammonia from adenosine which formed blue indophenol with phenol and hypochlorite in alkaline medium in presence of sodium nitroprusside as catalyst. Serum ADA activity is proportional to intensity of blue color formed.

RESULTS

A total of 80 women comprising of 50 hypertensive pregnant women and 30 normotensive pregnant women were included in the present study. In both groups blood pressure was measured and serum ADA was estimated. The results of the study were analyzed by using SPSS (software package for statistical studies). The results were expressed as Mean \pm Standard Deviation (SD). Statistical analysis was performed applying 't' test. The probability value (p) < 0.05 was considered statistically significant.

Gestational hypertensive women were in the age between 18-29 years (Mean age was 23.0 ± 3.0). Normotensive pregnant women were in the age between 18-27 years (Mean age was 21.5 ± 3.0). There was no significant difference in the mean age values of gestational hypertensive women and normotensive women (Table-1). The blood pressure was calculated separately as systolic blood pressure (SBP) and diastolic blood pressure (DBP). The mean SBP of gestational hypertensive women was 146.40 ± 10.40 mmHg and that of normotensive was 99.33 ± 9.40 mmHg. The mean of SBP was significantly higher in gestational hypertensive women than in normotensive women ($p < 0.001$, Table-1). The mean DBP of gestational hypertensive women was 88.40 ± 7.10 mmHg and that of normal pregnant women was 69.33 ± 7.39 mmHg. The mean DBP of hypertensive women was higher than normal pregnant women ($p < 0.001$, Table-1). The mean of serum ADA in gestational hypertensive women was 64.84 ± 12.76 U/L and that of normal pregnant women was 45.03 ± 8.78 U/L. The mean ADA of hypertensive pregnant women was higher than normotensive pregnant women ($p < 0.001$, Table-1).

Table-1. The number, age, systolic blood pressure (SBP), diastolic blood pressure (DBP) and serum ADA levels in normotensive and gestational hypertensive women

	Nor motensive pregnant women	Gestational hypertensive women
Number	30	50
Age	21.50 ± 3.0	23.00 ± 3.0
SBP	99.33 ± 9.40	146.40 ± 10.40*
DBP	69.33 ± 7.39	88.40 ± 7.10*
Serum ADA	45.03 ± 8.78	64.84 ± 12.76*

Values are Mean ± S.D ; * Compared to normotensive pregnant women $p < 0.001$.

DISCUSSION

Serum ADA levels changes in disease associated with altered cellular immunity [6,7]. Alterations in serum ADA activity was reported in normal pregnancy[16]. Increased serum ADA levels were observed in conditions like preeclampsia ,recurrent abortions and hyperemesis gravidrum in which enhanced cellular immunity involved in pathogenesis [17-19]. In the present study the serum ADA activity of gestational hypertensive cases 64.84 ± 12.76 U/L, was found to be significantly higher than that of normotensive controls 45.03 ± 8.78 U/L. This increase is statistically significant ($p < 0.001$). These results are consistent with the findings reported in hypertensive pregnancy [20]. Alterations in immune response are implicated in genesis of hypertension [14]. The increased serum ADA level in the present study indicates increased cellular immunity may have a role in the pathogenesis of gestational hypertension.

CONCLUSION

The present study show increased serum ADA level in gestational hypertensive women indicating a role for immune response in the genesis of hypertension in pregnant women.

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