A Comparative Study of Serum Uric Acid Level During Normal Pregnancy and Pregnancy Induced Hypertensive Women

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INTRODUCTION

Hypertension is one of the common complications met with in pregnancy. It contributes significantly to the cause of maternal and perinatal morbidity and mortality. Gestational hypertension is a common first clinical presentation of preeclampsia. It is well known that serial changes occur in serum uric acid level in normal pregnancy¹ and pregnancy induced hypertension². Pregnancy induced hypertension is an exclusive condition affecting 10% of pregnant women³. The raised level of uric acid in the pregnancy induced hypertension is considered to be due to its diminished destruction in liver, which was based upon the observation of Stander and Cadden⁴ (1934), who did not find impairment of uric acid excretion. However, Sieitchik⁵ (1956) showed that there was excessive reabsorption of urate by renal tubules in toxemic condition. They reported that the faulty renal function was the sole causative factor in urate accumulation in pregnancy induced hypertension. There is positive correlation seen between the raised serum uric acid level and adverse fetal outcome⁶. Therefore, in view of the greater emphasis placed on maternal and child health in present era, the present study was undertaken to compare serum uric acid level during normal pregnancy and pregnancy induced hypertension.

MATERIALS AND METHODS

The present study was carried out at Physiology department, government medical college and civil hospital, Surat, from 2009 to 2010. The study was performed on 100 pregnant women. Out of which 50 women were pregnancy induced hypertensive and 50 were normal pregnant women. The result showed significantly high blood pressure (SBP 163.76±18.8 VS 123.64±5.19, DBP 107.68±8.35 VS 78.6±3.11) and serum uric acid level (7.46±1.29 mg% VS 4.24±0.6 mg%) in pregnancy induced hypertensive women compares to normal pregnant women. CONCLUSION: Measurement of serum uric acid could be used as a biochemical indicator in pregnancy induced hypertensive women.

Key words: Pregnancy induced hypertension, Serum uric acid.
venipuncture. Serum uric acid was determined by quantitative estimation on colorimetric method by enzymatic uricase method. Statistical analysis of data was done by mean values, SD, T-test, P value for significance.

RESULT
The systolic blood pressure among normal pregnant subjects was higher (123.64 +/- 5.19) as compare to control subjects (117.8 +/- 5.64) and was statistically significant (p<0.001). But the diastolic blood pressure among normal pregnant subjects was (78.6 +/- 3.11) and control subjects was (76.8 +/- 4.69) which was statistically not significant (p>0.05).

Blood pressure and serum uric acid level in control subjects, normal pregnancy patients and pregnancy induced hypertensive patients.

<table>
<thead>
<tr>
<th>Volunteers</th>
<th>SBP (mm Hg) Mean +/- SD</th>
<th>DBP (mm Hg) Mean +/- SD</th>
<th>S. Uric Acid (mg/dl) Mean +/- SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (n=30)</td>
<td>117.8 +/- 5.64</td>
<td>76.8 +/- 4.69</td>
<td>3.99 +/- 0.58</td>
</tr>
<tr>
<td>Normal pregnant (n=50)</td>
<td>123.64 +/- 5.19</td>
<td>78.6 +/- 3.11</td>
<td>4.24 +/- 0.6</td>
</tr>
<tr>
<td>PIH (n=50)</td>
<td>163.76 +/- 18.8</td>
<td>107.68 +/- 8.35</td>
<td>7.46 +/- 1.29</td>
</tr>
</tbody>
</table>

The systolic blood pressure (163.76 +/- 18.8) and diastolic blood pressure (107.68 +/- 8.35) in pregnancy induced hypertensive patients is highly significant (p<0.001) in comparison with normal pregnant subjects with systolic blood pressure (123.64 +/- 5.19) and diastolic blood pressure (78.6 +/- 3.11). Serum uric acid level in control group was (3.94 +/- 0.6 mg%) and in normal pregnancy patients (4.24 +/- 0.6 mg%) which was statistically not significant (p>0.05). While serum uric acid level in pregnancy induced hypertensive was (7.46 +/- 1.29) and in normal pregnancy patients is (4.24 +/- 0.6mg%) that was statistically highly significant (p<0.001).

DISCUSSION
Pregnancy induced hypertension is a major health problem in pregnant women despite of advancements in the field of medical sciences. In this study systolic blood pressure significantly increased in both normal and PIH subjects. While elevation of diastolic blood pressure is significant in pregnancy induced hypertensive subjects. So, there is a positive correlation between diastolic blood pressure and serum uric acid level. Mustaphietal², Redman⁷, Verma⁸ also reported similar findings. In present study elevation of serum uric acid level is significant (p<0.001) in pregnancy induced hypertensive subjects (7.46 +/- 1.29) as compared to normal pregnant subjects (4.24 +/- 0.6) and control subjects (3.99 +/- 0.58). Mustaphi² and Redman⁷ also found elevation of serum uric acid in pregnancy induced hypertensive subjects.

According to Redman⁷ serum uric acid level concentration also predicts pre-eclampsia and perinatal outcome& is one of the most consistent and earliest detectable change in pre-eclampsia. He also stated that serum uric acid level were better indicator than blood pressure levels in predicting fatal prognosis. Chesely and Williams stated that in pregnancy induced hypertension there was impaired tubular reabsorption of uric acid leads to impaired uric acid clearance. However, Pollak and Nettles¹⁰ reported that decreased uric acid clearance was the result of enhanced tubular reabsorption or inhibited tubular secretion or both. Uric acid is a metabolite of the degradation of nucleotides which increases their blood levels in patients with pre-eclampsia and eclampsia. Its synthesis increasing by damage and death of trophoblastic cell and decreased urinary excretion due to lower glomerular filtration rate and increased absorption in the proximal tubule¹¹. measurement of serum uric acid has a great diagnostic value in pregnancy induced hypertensive and could be used as a biochemical indicator in PIH. So, the disease can be identified early and its deterioration prevented by proper management.

REFERENCES
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