A STUDY OF SERUM URIC ACID LEVELS IN PREECLAMPSIA

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Abstract

Background: To Study Serum Uric Acid level elevation in Hypertensive Disorders of Pregnancy.

Methods: 50 Patients diagnosed as having Pre-eclampsia with age between 18-37 years and 50 controls with similar age group.

Results: The mean serum uric acid level in control group was 3.41 ± 0.62 and in patient 7.01 ± 0.58 which was statistically significant (p = 0.001).

Conclusion: Serum uric acid levels were significantly higher in preeclampsia could be a useful indicator of fetal complication in preeclampsia patients.

Keywords: serum uric acid, preeclampsia, laboratory.

Introduction

Hypertensive disorders are among the commonest medical disorders during pregnancy and continue to be a major cause of maternal and perinatal morbidity and mortality worldwide. In developing countries they rank second only to anaemia, with approximately 7-10% of all pregnancies being complicated by some form of hypertensive disease. Pregnancy may induce hypertension in women who are normotensive before pregnancy and may aggravate hypertension in those that are hypertensive before pregnancy. Early screening for preeclampsia may allow vigilant antenatal surveillance and appropriate timing of fetal delivery in order to avoid serious sequelae.¹

Uric acid is a product of purine degradation catalysed by the enzyme xanthine oxidase. In normal pregnant women serum uric acid concentration initially falls 25-30% due to elevation in renal clearance secondary to increased GFR or reduced proximal tubular reabsorption due to changes in its production rate. Later in pregnancy the serum uric acid levels increase due to foetal production, decreased uric acid clearance and decreased binding to albumin.²,³ Uric acid is filtered, reabsorbed and secreted by the kidney. The most commonly accepted explanation for hyperuricemia is increased reabsorption and decreased excretion of uric acid.

Due to limited study in our region we conducted a study to serum uric acid elevation in Hypertensive Disorders of Pregnancy.

Material and Method

This observational study was conducted on 50 Patients diagnosed as having Pre-eclampsia with age between 18-40 years and 50 controls with similar age group. Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimation.

Patients with history of renal disease, chronic hypertension, cardiovascular disease, thyrotoxicosis, liver disease were excluded.

After obtaining informed written consent from all the study subjects relevant data were documented in a predefined data sheet and blood samples were collected from study subjects for estimation of serum uric acid levels.

Uric acid estimation was done by Uricase Peroxidase Method.

Data analysis- All data were analyzed by Epi-info software.

Results

Table 1: Socio-demographic profile

<table>
<thead>
<tr>
<th>Socio-demographic profile</th>
<th>Case</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Yrs)</td>
<td>24.23±2.36</td>
<td>24.23±2.36</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Rural: Urban</td>
<td>26.24</td>
<td>25.25</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hindu: Muslim</td>
<td>43.7</td>
<td>44.6</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

Both groups were comparable.
Table 2: Shows the mean serum Uric acid levels in patients and controls.

<table>
<thead>
<tr>
<th>Serum uric acid level</th>
<th>Case</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.01</td>
<td>3.41</td>
</tr>
<tr>
<td>SD</td>
<td>0.58</td>
<td>0.62</td>
</tr>
<tr>
<td>p-value</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

The mean serum uric acid level in control group was 3.41 ± 0.62 and in patient 7.01 ± 0.58 which was statistically significant (p =0.001).

Table 3: Perinatal outcome

<table>
<thead>
<tr>
<th>Perinatal outcome</th>
<th>Case</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APGAR score &lt;7</td>
<td>11(22.00%)</td>
<td>2(4.00%)</td>
<td>0.039</td>
</tr>
<tr>
<td>Preterm delivery</td>
<td>9(18.00%)</td>
<td>1(2.00%)</td>
<td>0.037</td>
</tr>
<tr>
<td>IUGR delivery</td>
<td>10(20.00%)</td>
<td>1(2.00%)</td>
<td>0.023</td>
</tr>
</tbody>
</table>

Fetal complications were more common in cases.

Discussion

In the present study, estimation of serum uric acid levels were measured in patients with pregnancy induced hypertension & preeclampsia and in normal pregnant women. Serum uric acid levels in preeclampsia and PIH patients were found to be significantly higher as compared to controls group (p < 0.05). The mean serum uric acid level in control group was 3.41 ± 0.62 and in patient 7.01 ± 0.58 which was statistically significant (p =0.001). A similar conclusion was drawn by Odegard et al where they showed nulliparity as a risk factor of pre-eclampsia.4

In normal pregnancy, serum uric acid level slowly decreases until about 16 weeks of gestation, secondary to plasma volume expansion, increased renal clearance, and the uricosuria effect of estrogen. For most of the 2nd trimester, the uric acid level remains stable, and then increases during the 3rd trimester because of increase catabolism/production. Uric acid is one of the most sensitive indicators of the disease severity in pregnancy induced hypertensive disorders and can be of great help in monitoring the cause of disease process. In preeclampsia, uric acid level has been known to be increased and to correlate with maternal and fetal morbidity, but always has been assumed to be a reflection of disease rather than a cause and it has antioxidant properties that serve to protect from oxidative stress, but it also appears to contribute directly to endothelial dysfunction by its proinflammatory effects, as well as to hypertension during preeclampsia.

Conclusion

Serum uric acid levels were significantly higher in preeclampsia could be a useful indicator of the fetal complication in preeclampsia patients.

References

5. 2002;107;1410-6.