ABSTRACT

Uric acid is the end product of purine metabolism in humans. Excess serum accumulation can lead to various diseases, so this present study was undertaken to observe the association of serum uric acid with type 2 diabetes mellitus. This study was carried out in 50 type 2 diabetes mellitus patients and 50 apparently normal individuals. The study showed a positive correlation between the level of uric acid and duration of diabetes mellitus.

KEYWORDS: Type 2 diabetes mellitus, uric acid

Introduction:-
In humans uric acid is the final oxidation product of purine catabolism with the loss of uricase. The association of hyperuricemia with hyperglycemia was first described in 1923 and ever since there has been a growing interest in the studies related to association of hyperuricemia with hyperglycemia.2-4 The putative association between serum uric acid levels and diabetes mellitus is not clear. Some studies reported that there is a positive association between high serum uric acid levels and diabetes 5-7 whereas other studies reported no association8, or an inverse relationship.9-11 In this context, the main purpose of our study was to examine the association between serum uric acid and type II diabetes mellitus and its change with increased duration of disease.

Materials and methods:-
The study was conducted in the Department of Physiology, Assam Medical College, Dibrugarh. A total of 50 type II diabetes mellitus patient and 50 apparently normal individuals participated in the study. Their mean age was 42±3 years. Their ages, smoking habits, physical status and health conditions were recorded by using a questionnaire. The ethical committee clearance and an informed consent of the subjects were taken. Diabetes was defined based on the guidelines of the American Diabetes Association as a serum glucose ≥126 mg/dL after fasting for a minimum of 8 hours, a serum glucose ≥200 mg/dL for those who fasted <8 hours before the test, or a self-reported current use of oral hypoglycaemic medication or insulin. Type 2 diabetes mellitus with complications were excluded from the study. Serum uric acid was estimated by enzymatic (uricase) method. The data was analyzed by using Microsoft Excel and Statistical Package of Social Sciences (SPSS version 2.0). The mean and standard deviation (SD) were calculated and reported for the quantitative variables. The statistical difference in the mean values was tested by using one way ANOVA (analysis of variance) method. The same was statistically significant.

Table 1:- Showing the mean±SD values of uric acid in the different groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean±SD</th>
<th>±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>6.23±0.39</td>
<td>0.39</td>
</tr>
<tr>
<td>Group 1</td>
<td>7.35±0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>Group 2</td>
<td>7.85±0.22</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Discussion:-
In this study it is seen that the level of uric acid is positively associated with duration of type 2 diabetes mellitus. This finding is consistent with the findings of A. Dehghan et al, K. L. Chien et al, C. K. Kramer et al and others, whereas some other study reported no positive association between serum uric acid and diabetes mellitus. Also, some studies reported that serum uric acid is inversely associated with diabetes mellitus.12,13. It has been shown that patients with insulin resistance or impaired glucose tolerance have reduced values of urinary uric acid clearance12 and chronically increased extracellular adenosine concentrations, thereby contributing to increasing uric acid synthesis.25 So, both the factors that increase serum uric acid synthesis (e.g., an increased activity of the hexose monophosphate shunt and thereby purine biosynthesis) or those that decrease urinary uric acid excretion rate (e.g., an increased tubular reabsorption and/or diminished tubular secretion) might be involved in leading to hyperuricemia.
Conclusion: From this study it can be concluded that the uric acid may serve as a potential biomarker of deterioration of glucose metabolism, so its detection and prevention at the earliest is of uttermost importance.

References: