LETTER TO THE EDITOR

CIRCADIAN VARIATION OF PLASMA 17- HYDROXYCORTICOSTEROID (17- OHCS) IN CAVITARY AND NON-CAVITARY PULMONARY TUBERCULOSIS

(Received on November 26, 1990)

Plasma 17-OHCS level is elevated in acute cases of pulmonary tuberculosis, with marked increase with advancement of disease (1). Circadian variations in circulating 17-OHCS in patients with pulmonary tuberculosis has not been done. It was therefore, decided to study these changes in tuberculous patients.

Twenty five patients of pulmonary tuberculosis (35-60 years), and ten clinically healthy volunteers of comparable age group, were included in the study. All the subjects were synchronized with diurnal activity from 0600 to 2100 hrs and nocturnal rest for 1 week. Meals were served at 0630, 1300 and 2030 hrs and the participants had their normal fluid intake. No drugs were used by the subjects that would affect corticosteroid kinetics. Blood samples were collected at 8 hrs intervals during the 24 hrs period, beginning at 0800 hrs and plasma 17-OHCS measured (2). The subjects were divided in different groups; healthy subjects forming group I while patients formed group II and group III on the basis of presence or absence of cavity respectively. Students 't' test for paired samples was used to evaluate the differences between values recorded at each corresponding time (P < 0.05 was taken as significant). Further single and mean cosine procedures (3) were used for both detection and characterisation of circadian rhythm.

A definite rhythm in the concentration of plasma 17-OHCS was observed in healthy volunteers. Plasma 17-OHCS was maximum as 0800 hr, which declined gradually reaching minimum at 0000 hr. These findings are comparable with the observations of other investigators (4-5). Plasma 17-OHCS levels were found to be elevated in both groups of tubercular patients. These findings are similar to the findings of Srivastava et al (4). Circadian patterns of plasma 17-OHCS were deranged in four patients of cavitary and two patients of non-cavitary disease (Tables I and II). There is thus no relationship observed in

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Subjects/Group</th>
<th>Time intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0800</td>
</tr>
<tr>
<td>1.</td>
<td>Controls/Group I</td>
<td>18.79±1.27</td>
</tr>
<tr>
<td>2.</td>
<td>Patients/Group II (Cavitary with normal rhythm)</td>
<td>24.92±1.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P1 &lt;0.01</td>
</tr>
<tr>
<td>3.</td>
<td>Patients/Group III (Cavitary with Disturbed Rhythm)</td>
<td>20.45±2.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2 &gt;0.05</td>
</tr>
<tr>
<td>4.</td>
<td>Patients/Group III (Non-Cavitary with Normal Rhythm)</td>
<td>22.36±6.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P3 &gt;0.05</td>
</tr>
<tr>
<td>5.</td>
<td>Patients/Group III (Non-Cavitary with Disturbed Rhythm)</td>
<td>18.15±1.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P4 &lt;0.01</td>
</tr>
</tbody>
</table>

P1, P2, P3, & P4 are the corresponding values when compared with controls.
TABLE II

<table>
<thead>
<tr>
<th></th>
<th>(Group I)</th>
<th>(Group II)</th>
<th>(Group III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesor</td>
<td>13.870</td>
<td>17.438</td>
<td>16.617</td>
</tr>
<tr>
<td>Amplitude</td>
<td>6.731</td>
<td>9.112</td>
<td>8.032</td>
</tr>
<tr>
<td>Acrophase</td>
<td>-147.87</td>
<td>-154.60</td>
<td>-160.76</td>
</tr>
<tr>
<td>HRS</td>
<td>0952</td>
<td>1019</td>
<td>1043</td>
</tr>
<tr>
<td>F</td>
<td>63.28</td>
<td>42.40</td>
<td>24.33</td>
</tr>
<tr>
<td>(DF)</td>
<td>(2.27)</td>
<td>(2.36)</td>
<td>(2.15)</td>
</tr>
<tr>
<td>P</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Comparison of over all rhythm

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Vs Group II</th>
<th>and</th>
<th>Group I</th>
<th>Vs Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>6.840</td>
<td></td>
<td></td>
<td>4.743</td>
<td>P &lt;0.001</td>
</tr>
<tr>
<td>DF</td>
<td>(3.93)</td>
<td></td>
<td></td>
<td>(4.42)</td>
<td>P &lt;0.01</td>
</tr>
</tbody>
</table>

The circadian rhythms of plasma 17-OHCS with the presence or the absence of cavity, in cases of pulmonary tuberculosis. Circadian periodicity of adrenocorticoids has been found to be absent in certain altered states of unconsciousness, like delirium coma, semicoma and Cushing's syndrome (7-9).

The normal circadian rhythms of plasma 17-OHCS in patients, as observed in the present study, are mainly due to individual difference in susceptibility to the patho-physiological stress of the disease. The patients with altered rhythms might not be able to bear the additional stress of more severe infection. On the other hand, the patients with normal rhythms may still have strong internally active anatomical neurochemical and neurophysiological factors capable of regulating a normal adrenocortical rhythm and providing increased corticosteroid production against such stress. However, this possibility needs further confirmation.

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REFERENCES


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