It has been previously reported that 80% of a total of 20 leprosy patients, irrespective of type of illness, had failed to exhibit positive Prausnitz-Kustner (P-K) reactions when tested with homologous reaginic sera, which had given highly positive (++ to +++) P-K reactions in normal individuals (11). It was further observed that reactions to histamine were significantly depressed in leprosy patients as compared with healthy controls. It is interesting to recall that in the patients with tuberculoid leprosy with reaction, histamine content of the affected tissue, measured pharmacologically, was less than that of normal or tuberculoid tissue (1). Mast cells were found degenerated and without granules and their number was less than in quiescent tuberculoid leprosy. Thus, a possibility of altered histamine catabolism is indicated in patients with leprosy; this has stimulated the authors to study the histaminase levels in these patients.

MATERIALS AND METHODS

The study involved 65 individuals, of which 36 suffered from leprosy and the remaining were normal. The former group was comprised of 27 cases of lepromatous leprosy including 14 patients with erythema nodosum leprosum and 9 cases of tuberculoid leprosy. The lepromatous group included cases of borderline lepromatous leprosy while the tuberculoid group included patients of borderline tuberculoid variety. Classification of leprosy type was based on clinical history, physical examination, lepromin (Mitsuda type) test and skin biopsy (12).

Ten milliliters of blood were collected by venipuncture and the serum thus obtained was stored at −20°C. The blood samples were not collected from pregnant or menstruating women. Serum histaminase was estimated according to the microspectrophotometric method of Arsen and Kemp (1). The results were expressed in provisional units (Pr U), one provisional unit being equal to the amount which produced an increase of 0.01 in optical density at 470 μg after incubation for four hours.

FIG. 1. Shows the variations in the level of serum histaminase in normals and different types of leprosy patients.
RESULTS

Figure 1 and Table 1 show the serum histaminase values in leprosy patients and normal individuals. The histaminase values ranged between 0 to 173 Pr U/ml (mean 66.04±9.02) in the control group, and between 14 to 292 Pr U/ml (mean 139.75±11.89) in the leprosy group. The values are significantly higher in patients with leprosy. Serum histaminase varied between 14 to 292 Pr U/ml (mean 149.45±14.05) and between 60 to 215 Pr U/ml (mean 111.56±20.64) in lepromatous and tuberculoid patients respectively. The values in both these groups are significantly higher than the controls but there was no significant difference between the histaminase values of lepromatous and tuberculoid cases. Patients having lepromatous leprosy with erythema nodosum showed significantly higher histaminase levels in comparison to both tuberculoid and lepromatous leprosy without erythema nodosum leprosum. Again no difference was observed between the values for tuberculoid patients and lepromatous leprosy patients without erythema nodosum.

DISCUSSION

Oxidative deamination by histaminase is an important pathway of histamine catabolism. Histaminase occurs widely in different organs of many species (2). Although plasma histaminase levels have been known to be enhanced in pregnancy for some time, its interrelationship with tissue injury has been realized only very recently. Raised histaminase has been reported in plasma and/or tissue in experimental thermal injury (6–7), anoxia and anaphylaxis (9–10), hepatic damage (4), myocardial infarction (8) and status asthmaticus (5). It has been speculated that enhanced histaminase levels are a part of the general response of tissue to injury (6).

In an earlier study it was observed that 80% of leprosy patients had exhibited negative P-K reaction, when tested with homologous reaginic sera, irrespective of type of leprosy (11). Similarly the present findings have shown a significantly raised serum histaminase level in leprosy patients irrespective of type of disease, as compared to healthy persons. There was no significant difference between the values in patients of lepromatous leprosy without erythema nodosum and tuberculoid cases. On the contrary, serum histaminase levels were significantly higher in patients with lepromatous leprosy with erythema nodosum than in those without erythema nodosum or in those suffering from tuberculoid leprosy. Histaminase levels are known to be enhanced during immediate type of hypersensitivity reactions

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. individuals</th>
<th>Serum histaminase (Pr U/ml) mean ± S.D.</th>
<th>Significance of difference between various means</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Normal</td>
<td>29</td>
<td>66.04 ± 9.02</td>
<td>Vs B; P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>B Leprosy</td>
<td>36</td>
<td>139.75 ± 11.89</td>
<td>Vs A; P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>C Lepromatous leprosy</td>
<td>27</td>
<td>149.45 ± 14.05</td>
<td>Vs A; P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>D Lepromatous leprosy with erythema nodosum</td>
<td>14</td>
<td>188.50 ± 17.05</td>
<td>Vs E; P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>E Lepromatous leprosy without erythema nodosum</td>
<td>13</td>
<td>106.77 ± 8.51</td>
<td>Vs D; P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>F Tuberculoid leprosy</td>
<td>9</td>
<td>111.56 ± 20.64</td>
<td>Vs A; 0.02 &gt; P &gt; 0.01 (S)</td>
</tr>
</tbody>
</table>

Vs = versus; S = significant; NS = not significant.
(°). The finding that histaminase levels were significantly raised in patients with lepromatous leprosy with erythema nodosum as compared to those without erythema nodosum supports the view that development of erythema nodosum is an immediate type of hypersensitivity (Arthus type) reaction (13).

Histaminase levels may have some diagnostic or prognostic significance in leprosy, which is difficult to comment on at present, but the matter is being studied.

SUMMARY

Serum histaminase was estimated in 29 healthy adults and in 36 leprosy patients including 27 lepromatous leprosy and 9 tuberculoid leprosy cases. Of the 27 lepromatous leprosy individuals 14 suffered from erythema nodosum leprosum. The serum histaminase levels were significantly raised in leprosy patients as compared with normal controls. But there was no significant difference in the enzyme values between patients having lepromatous leprosy without ENL and those with tuberculoid leprosy. However, the value of serum histaminase was found to be further elevated when the lepromatous leprosy patients developed ENL.

RESUMEN

Se determinó histaminasa sérica en 28 adultos sanos y en 36 pacientes con lepra, incluyendo 27 casos con lepra lepromatosa y 9 con lepra tuberculoid. De los 27 casos con lepra lepromatosa, 14 individuos tenían erythema nodosum leprosum. Los niveles de histaminasa sérica estaban significativamente aumentados en los pacientes con lepra en comparación con los controles normales. Pero no hubo diferencia significativa de los valores enzimáticos entre los pacientes que tenían lepra lepromatosa sin ENL y los que tenían lepra tuberculoid. Sin embargo, el valor de la histaminasa sérica estaba aún más aumentado cuando los pacientes con lepra lepromatosa desarrollaban ENL.

RÉSUMÉ

Chez 29 adultes normaux en bonne santé, et chez 36 malades atteints de lèpre, dont 27 lépromateux et 9 tuberculoïdes, on a procédé à l’estimation de l’histaminase du sérum. Sur les 27 malades souffrant de lèpre lépromateuse, 14 présentaient un érythème nouveaux lépreux. Les taux d’histaminase sérique étaient significativement augmentés chez les malades atteints de lèpre, comparés aux témoins normaux. Il n’a cependant pas été noté de différence significative dans les valeurs de cette enzyme entre les patients soufrant de lèpre lépromateuse sans érythème nouveaux lépreux, et ceux qui présentaient une lèpre tuberculoïde. Toutefois, on a observé une élévation encore plus accrue de l’histaminase sérique lorsque les malades lépromateux développaient un érythème nouveaux lépreux.

Acknowledgment. We extend our thanks to Dr. B. Sharma, Officer-In-Charge, Leprosy Home, Shahdara, Delhi, and Prof. A.B. Chaudhury, Director, School of Tropical Medicine, Calcutta, for their cooperation during the period of study; to Mr. B.S. Negi and S. Banerjee for their technical assistance; and Dr. P.V. Kurian, S.L.R. Sanatorium, Karigiri, India for supplying lepromin.

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