

THE MITSUDA TEST IN NON-LEPROUS PERSONS IN
A NON-ENDEMIC COUNTRY*

by

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The present report deals with the reaction to lepromin in individuals living in a country relatively free from leprosy. The aim of the authors was to confirm studies of a similar nature by workers in other countries.

Cummins and Williams (1) in England found 6 positives among 25 mental patients, or 25 per cent, using lepromin diluted five times. Dubois (2) in Belgium found 15 of 29 persons to be reactors, or 51 per cent, accepting a reading of 3 mm. or more as positive. Boncinelli (3) in Italy reported 22 positives among 44 patients with various dermatoses, or 50 per cent. Six of the patients had cutaneous tuberculosis. Fernandez (4) in Paris found 33 reactors among 42 patients in a dermatology clinic, or 79 per cent. Eleven of these patients had tuberculosis of the skin. Bechelli *et al.* (5) found 93 per cent of a group in New York City positive.

The material used in the present study was "integral antigen" recently prepared by the Mitsuda-Hayashi technique and demonstrated to be rich in bacilli. The individuals tested were syphilitic patients under treatment in the outpatient department of the University Hospitals, Western Reserve University, Cleveland, Ohio. All persons tested were adults. Both sexes were represented and the group was predominantly Negro. Patients who were born or had lived in states where leprosy is endemic were excluded from the study.

The test was performed by injecting intradermally both 0.1 cc. of the lepromin full strength and the same amount after a 1:10 dilution. The reaction was read three to four weeks later. A nodule of not less than 4 mm. was considered positive.

Of the 73 patients on whom final readings could be made 54 or 74 per cent gave a positive Mitsuda reaction to the full strength lepromin but only 24 or 33 per cent to the diluted lepromin. Among males 66 per cent reacted positively and among females 86 per

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cent. Thus the proportion of persons, supposedly free from contact with *M. leprae*, who reacted positively to lepromin was high, and was higher for females than for males.

A direct relationship between the proportion showing a positive reaction and the concentration of the bacilli in the antigen was thus verified. This fact may explain the difference in the level of positivity to the Mitsuda antigen as reported by various authors, since the concentration of bacilli varies with each preparation made. This emphasizes the necessity of establishing a standard technique for preparation of antigens if results are to be comparable. It is hoped that in this Conference steps may be taken to prepare such a standard, and that results from its use may be presented at the next Conference.

How can this high degree of positivity to the lepromin test of persons who have never been in contact with the *M. leprae* be explained? Some authors believe it due to a cosensitivity to the *M. tuberculosis*, others explain it as a non-specific general reaction of the organism. We believe that neither of the two theories alone will entirely explain this phenomenon.

Radna (6) in testing 100 tuberculin negative healthy persons in a non-endemic leprosy area found 94 per cent positive. Testing a group of 25 cachetic patients, on the other hand, he obtained only one positive reaction. This experiment would rule out the theory of cosensitivity and emphasize that of the general biological defense.

However, if the results of the Mitsuda test among children in a non-endemic leprosy area be compared to those among tuberculous children of the same age, the proportion of positives is higher in the latter group. The authors have previously reported on a study of the lepromin reaction in tuberculous children at Seaview Hospital, Staten Island, N. Y. (7). Comparing these data to those of Dharmendra and Jaikaria (8) shows that whereas 14 per cent of children in the group under 5 years of age in a non-endemic leprosy area (Punjab, India) reacted positively, 45 per cent of the tuberculous children in the same age group at Seaview gave positive reactions. This would lend evidence to the cosensitivity factor in explaining the mechanism of the lepromin test.

We believe that the Mitsuda phenomenon has as a fundamental basis, a constitutional defensive reactivity of the tissues, without which there can be no positive reaction. When this fundamental element is present, it may be enhanced either by *M. leprae* or by *M. tuberculosis*.

SUMMARY AND CONCLUSIONS

1. Among 73 American adults of both sexes, but predominantly Negroes, 74 per cent reacted positively to full strength lepromin, but only 33 per cent to a 1:10 dilution of the same lepromin.

2. Among males, 66 per cent reacted positively and among females 86 per cent.

3. Concentration of bacilli in the antigen is important and should be standardized if results are to be compared.

4. The authors believe that the mechanism of the Mitsuda phenomenon is due to a basic constitutional reactivity of the tissues. This natural tissue response may be accelerated either by *M. leprae* or *M. tuberculosis*.

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