

LEPROMIN SKIN TEST IN NORMAL PEOPLE IN SINGAPORE: A 1 YEAR FOLLOW-UP

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INTRODUCTION

The Lepromin test is an intradermal skin test used to classify a case of Hansen's disease into the Tuberculoid or Lepromatous variety. (1) In the former the test will be strongly positive while in the latter it will be negative. It has no diagnostic value. It is a measure of the cell mediated response to the lepra bacilli (2). This survey was prompted by the fact that the incidence of Lepromin positivity in Singapore is unknown. Singapore is a highly urbanized island in South East Asia which is endemic for Hansen's.

MATERIALS AND METHODS

Lepromin solution was prepared in the manner recommended by WHO (3, 4, 5). The solution contained 160×10^6 bacilli per ml prepared from a nodule of a lepromatous Leprosy patient. 0.1ml was then injected intradermally into the volar aspect of the right forearm 3 inches below the elbow joint. 60 teenage and adult, males and females of all ages who had come to Middle Road Hospital for routine VDRL screening in June 1983 were selected randomly. They were asked if they had any family, contact past or present history of Hansen's, and not included in the project if there was any suspicion of Hansen's. The test and readings were all performed by, and the Mitsuda reaction read, at 21 days by 2 people in the department. Simultaneously the tuberculin test was done on the other forearm. 1 year later the subjects were recalled and retested with Armadillo prepared Lepromin containing 160×10^6 bacilli per ml.

RESULTS

A positive result, was defined as per WHO criteria of any induration 3 mm and greater. (3) The table gives the breakdown of positive cases according to age (Table I and II) and race (Table III). There were 43 positive male

**TABLE 1 LEPROMIN TEST (HUMAN NODULE) IN 60 MALES
LEPROMIN TEST: (INDURATION — 3 MM AND ABOVE)**

Age Group	Positive	Negative	Total
10 — 19	6	2	8
20 — 29	32	6	38
30 — 39	5	4	9
40 — 49	1	1	2
50 — 59	—	2	2
60 — 69	—	1	1
Total:	44	16	60

TABLE 2 LEPROMIN TEST IN 60 FEMALES

Age Group	Positive	Negative	Total
10 — 19	—	—	0
20 — 29	16	5	21
30 — 39	14	6	20
40 — 49	13	2	15
50 — 59	1	3	4
Total:	44	16	60

TABLE 3 LEPROMIN TEST IN ETHNIC GROUPS

Race	Positive	Negative
Chinese	61	23
Malay	17	7
Indian	7	2
Others	3	—
Grand Total:	88	32

cases and 44 positive female cases. This gives a positivity rate of 70.3%. This corresponds to the rate found in most endemic countries where similar studies have been done. (6) In Cebu Island, where leprosy is endemic, Quinto found a 95.8% positivity rate in asymptomatic adults with no contact history. (7) Shepard (8) studied 73 normal adult male volunteers in Atlanta, Georgia, which is a non-endemic part of the USA and found a Mitsuda reaction greater than 4 mm in all the subjects studied. He also found that the sensitivity to tuberculin had little relationship to the Lepromin reaction. (Mitsuda) This present study confirms that relationship. Tuberculosis is also considered to be endemic in Singapore. A study similar to the present one was carried out in New York by Rotberg (9) who found a 62.4% positivity of the Mitsuda reaction. Waters (10) noted a 43% positive Mitsuda reaction of 5 mm diameter or more in 65 UK residents not exposed to leprosy who were tuberculin negative. There was no dif-

ference in the incidence of positivity in the various ethnic groups. 20 females and 10 males presented for the repeat Lepromin test. None had any feature suggestive of Hansen's and were all well. Among the females all positives remained positive at 21 days while 5 cases previously negative had readings of 3 mm or greater. This gave a 90% incidence of positivity. Among the males, of the 5 subjects initially negative, 2 became positive and had readings of 5 mm and 10 mm. A further 5 subjects were initially positive but on retest 2 were negative.

DISCUSSION

Hansen's disease is still endemic in Singapore although the number of new cases has been steadily decreasing particularly among the young. Since 70% of normal people demonstrate a positive skin reaction to human Lepromin, one explanation for this would be that they have been previously sensitized to the bacilli and therefore are capable of mounting a response or that lymphocytes which have never met the bacillus are able to mount a cell-mediated immune response. The tables do not show any significant difference in the positivity rate among different age groups, racial groups or sexes. This is not surprising as the lepra bacillus is strongly antigenic. Since this test is a consequence of an intact cell-mediated immune response to mycobacterium leprae and in view of its endemicity in Singapore and the surrounding region it may be possible to use this to measure the in vivo cell mediated immune status of patients. It is interesting to note the increase in positivity when retested with Armadillo Lepromin 1 year later. One possible explanation could be the increased sensitivity of Armadillo preparation. However in a study conducted in our hospital comparing human and Armadillo Lepromin simultaneously there was no significant difference. Another reason could be that prior sensitization with human Lepromin resulted in an enhanced reaction when challenged with Armadillo Lepromin. However the number of males are too small to reach statistical significance. The 2 males who became negative after initially being positive is unusual. It is possible that technical factors could account for this.

CONCLUSIONS

The study assessed the incidence of positive Lepromin skin test in a population of normal volunteers. This was found to be 70% and corresponded with studies in some endemic areas. There was no correlation with the Mantoux test. A repeat Lepromin test with Armadillo Lepromin resulted in an increased positivity to 90% in the women. It may also be useful to use Lepromin to assess the integrity of in vivo cell mediated immunity in other diseases, especially in areas where sophisticated immunological tests are unavailable. A similar study to ascertain the incidence and significance of a positive Mitsuda reaction in normal children should be carried out. Long term follow-up of the Lepromin negative subjects is being undertaken.

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