

STUDIES ON THE LEPROMIN TEST  
II. TIME OF READING AND ULCERATION OF  
THE LEPROMIN REACTION

D. L. LEIKER, M.D.

*Rotterdam, Netherlands*<sup>1</sup>

In 1957 the population of certain villages of the Wandamen Bay area, Netherlands New Guinea, were tested with lepromin and tuberculin. Lepromin was prepared according to Wade's modification of the Mitsuda-Hayashi method, but 90 cc. of phenol-saline solution per gram tissue was used. From previous experience it had been learned that this dilution still gives satisfactory reactions, and that the influence of the tissue elements of the lepromin is reduced to a minimum (<sup>1</sup>).

In two villages the lepromin reactions were read after 2 and 3 weeks after the test injections, and in another village after 3 and 4 weeks. Table 1 shows that the average size of reaction increases considerably during the third week, but only moderately during the fourth week. During the fourth week, however, the percentage of reactions which show ulceration still increases to an important degree. With respect to the size of reaction, it does not make much difference whether reactions are read at the end of three weeks or four weeks. With respect to ulceration, however, it is much better to read the reactions after four weeks.

According to the scale of readings adopted by the Madrid Congress in 1953, all ulcerating reactions, irrespective of the size, are to be placed in the strongest positive group. Since resistance to infection is believed to be measured by tissue reactivity, this means that resistance against *M. leprae* is supposed to be higher in people who show an ulcerating reaction than in people who show a reaction of the same size but without ulceration.

Judging from the scarce literature on the subject, not much attention has been paid to the study of ulceration in lepromin reactions. Table 1 also shows a positive correlation between the size of reaction to lepromin and the percentage of ulceration. However, the correlation is not a complete one.

Although the differences are small, it seems that the tendency to ulceration is somewhat greater when the tested persons are younger, as indicated in the data shown in Table 2. It is to be said that ulceration in weak reactions to lepromin is sometimes difficult to evaluate, as some of the small and superficial ulcers are caused by scratching and secondary infection.

<sup>1</sup> Formerly Chief, Division of Leprosy Control, Netherlands New Guinea.

TABLE 1.—*Sizes of reactions to lepromin 1/90, and frequency of ulceration, in readings made after 2, 3 and 4 weeks.<sup>a</sup>*

Size of reaction	Reaction		Ulceration	
	Number	Per cent <sup>b</sup>	Number	Per cent <sup>c</sup>
<i>Readings after 2 weeks (731 persons)</i>				
0-1	193	26	0	0
2-3	168	23	0	0
4-5	115	16	1	1
6-7	96	13	3	3
8-9	66	9	4	6
10-11	51	7	10	20
12-13	24	3	9	38
14-15	8	1	4	50
16-17	5	1	3	60
18-19	5	1	4	80
>19	1	-	1	100
<i>Readings after 3 weeks (1,053 persons)</i>				
0-1	217	21	0	0
2-3	195	19	0	0
4-5	167	16	6	4
6-7	181	17	36	20
8-9	121	12	44	37
10-11	76	7	53	70
12-13	45	4	37	82
14-15	26	2	23	88
16-17	14	1	13	93
18-19	9	1	9	100
>19	2	-	2	100
<i>Readings after 4 weeks (332 persons)</i>				
0-1	78	24	0	0
2-3	51	16	0	0
4-5	52	16	2	4
6-7	47	15	13	28
8-9	48	15	23	48
10-11	20	6	17	85
12-13	15	5	14	93
14-15	8	3	8	100
16-17	-	-	-	-
18-19	1	-	1	100
>19	2	-	2	100

<sup>a</sup> Based on tests of 731 persons at Wasior and Miei, reactions read after 2 and 3 weeks, and of 322 persons at Rassie, reactions read after 3 and 4 weeks. The 3-week results at these places were sufficiently similar to justify putting them together, to facilitate comparison with the two-week findings on the one hand and the four-week findings on the other hand.

<sup>b</sup> Percentages of subjects of the group showing reactions of the stated measurements.

<sup>c</sup> Percentages of subjects showing reactions of the stated measurements who also exhibited ulcerations.

It is also to be seen in Table 2 that there was a difference between males and females in this matter. The females showed a somewhat

TABLE 2.—Ulceration of lepromin reactions in males and females and in different age groups.

Sex	Size of reaction (mm.)	Age group (years)									
		0-9			10-19			20 or more		Total	
		No. of reactions	Ulcer No. & %	No. of reactions	Ulcer No. & %	No. of reactions	Ulcer No. & %	No. of reactions	Ulcer No. & %		
Male	4-7	53	7 13	103	10 10	123	17 14	279	34 12		
	8-11	18	8 44	53	28 53	163	53 33	234	89 34		
	>11	1	1 100	16	16 100	120	99 83	137	116 85		
Female	4-7	54	5 9	94	4 4	291	28 10	439	37 9		
	8-11	9	7 77	54	23 43	138	77 56	201	107 51		
	>11	2	2 100	11	11 100	59	57 97	72	70 97		
Total	4-7	108	12 11	197	14 7	414	45 11	718	71 10		
	8-11	27	15 55	97	51 53	301	130 43	435	196 45		
	>11	3	3 100	28	27 96	177	156 88	209	186 90		

stronger tendency to ulceration than did the males of the same ages and with the same sizes of reactions.

There is no reason to assume that the younger people in the Wandamen Bay area have a higher degree of resistance against *M. leprae* than older people. On the contrary, the leprosy index in this area is about 8 per cent, and it is more reasonable to assume that, as a group, those adult people who had much opportunity for leprosy contact during their life but do not show symptoms of the disease, possess a higher resistance than the younger people. Also, there is no reason to assume a particularly high resistance of the female population in the Wandamen Bay area. The prevalence of tuberculoid leprosy in women is twice as high as in men.

There seems to be no reason to classify ulcerating reactions in a higher group than nonulcerating reactions of the same size. The differences found are too small to permit conclusions about a higher or lower resistance against leprosy infection. It is more probable that differences in tendency to ulceration have been explained by differences in skin structure between old and young individuals and between men and women. But even so it is advisable to classify lepromin reactions according to the size of palpable infiltration only.

#### SUMMARY

In the fourth week after injection of lepromin the increase in size of the reaction lesions after the third week is not important, but the percentage of ulcers increases considerably. No evidence has been seen that ulceration of lepromin reactions points to a higher degree of resistance to leprosy infection, compared with reactions of the same size but without ulceration.

Younger people show some greater tendency to ulceration than older people, and females somewhat greater than males, but this is

probably caused by differences in skin structure.

It is recommended that lepromin reactions be graded according to the size of palpable infiltration only, without regard to the absence or presence of ulceration.

#### RESUMEN

En la cuarta semana consecutiva a la inyección de lepromina, no reviste importancia el aumento del tamaño de las lesiones debidas a la reacción, pero sube considerablemente el porcentaje de úlceras. No se han observado signos de que la ulceración de las reacciones a la lepromina señale un grado mayor de resistencia a la infección leprosa, en comparación con reacciones del mismo tamaño, pero sin ulceración.

Los sujetos jóvenes muestran una tendencia algo mayor a la ulceración que los de mayor edad, y las mujeres algo mayor que los hombres, pero esto probablemente es ocasionado por diferencias en la estructura cutánea.

Recomiéndase que se clasifiquen las reacciones a la lepromina de acuerdo exclusivamente con el tamaño de la infiltración palpable, haciendo caso omiso de la falta o existencia de ulceración.

#### RESUMÉ

Durant la quatrième semaine après l'injection de lépromine l'étendue des réactions apparues à la troisième semaine ne s'accroît pas de façon notable, mais le pourcentage des réactions ulcérées augmente considérablement. Il n'a pu être établi que l'ulcération des réactions à la lépromine traduirait un degré de résistance à lèpre supérieur à celui manifesté par des réactions de même étendue mais non ulcérées.

Les sujets jeunes témoignent d'une tendance quelque peu plus marquée à l'ulcération que les sujets plus âgés, et les femmes que les hommes. Ceci toutefois est sans doute dû à des différences dans la texture de la peau.

L'auteur recommande de noter les réactions à la lépromine en tenant compte de la dimension de l'infiltrat palpable, sans égard à l'absence ou à la présence d'ulcération.

#### REFERENCE

1. LEIKER, D. L. Studies on the lepromin test. I. The influence of the bacillary and tissue components in dilutions of lepromin. *Internat. J. Leprosy* **29** (1961) 157-167.