

# AN EVALUATION OF THE MAILLARD-GAGLIARDO COMPLEMENT FIXATION TEST IN LEPROSY

## A REVIEW OF 100 CASES

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The results of a modified Middlebrook-Dubos hemagglutination test in leprosy were reported recently from this laboratory (4). Old Tuberculin 4× Lederle was employed in that test to sensitize the sheep red blood cells. In a series of 261 cases it was observed that titers above those found in controls occurred in 231 cases, or 88.5 per cent.

In 1951 Maillard and Gagliardo (1) described a complement-fixation test in which there were used sheep red cells sensitized with old tuberculin, and, as complement, reconstituted dried, frozen guinea-pig serum. These authors concluded that their test gave better quantitative results than were obtained by the Middlebrook hemagglutination test. No positive titers were obtained in the 48 normal controls which they studied. Maillard (2) later used his test to study the sera of 24 leprosy patients of this institution, from all of whom tuberculosis had been excluded. Reaction titers were obtained in 23 of these 24 sera.

The purpose of the present paper is to report an evaluation of the Maillard-Gagliardo complement-fixation test in a larger group of leprosy patients. The Maillard technique (3) was employed, and 100 sera were tested; 90 of them were from lepomatous cases, and 10 from cases of the tuberculoid type. Sera from 20 persons without leprosy were used as controls. Tuberculosis had been excluded in all cases.

The Maillard test is characterized by a hemolytic reaction which results from the fixation of a complement by an antigen-antibody system. The specific complex is presumably formed at the cell surface; then, in the presence of complement, there occurs lysis of erythrocytes which is similar to lysis by specific hemolysin. The binding of the specific antibody as well as the complement to the surface of the blood cells is apparently determined by preliminary coating of the cell surface with antigen. The titer of the antiserum is described as the highest dilution in which there is a constant degree of hemolysis (50%) with a constant dose of complement (4 units).

## RESULTS

The results are shown in Table 1. In the first section, in which the type groups are treated as a whole, the figures show a wide range of reactivity, between titers of 4 and 100; no case was entirely negative. Among the 20 normal controls, titers as high as 10 were observed; one-

half of these sera were negative. In only 44 of the 100 leprosy cases were the titers higher than the highest found among the controls.

TABLE 1.—*Titers obtained with the Maillard-Gagliardo complement fixation test in 100 cases of leprosy and 20 normal controls.*

Type of cases	Bacteriology	No. of cases	Numbers of cases with titers of:					
			0	1-4	5-10	20-30	40-50	60-100
<i>All cases</i>								
Lepromatous	—	90	0	22	28	17	17	6
Tuberculoid	—	10	0	5	1	2	1	1
Total		100	0	27	29	19	18	7
Controls	—	20	10	6	4	0	0	0
<i>Bacteriologically negative and positive cases</i>								
Lepromatous, apparently arrested	Negative	34	0	17	10	5	2	0
Lepromatous, active	Positive	56	0	5	18	12	15	6
Tuberculoid	Negative	9	0	5	1	1	1	1
Tuberculoid, reactional	Positive	1	—	—	—	1	—	—

The second part of the table shows the results of the test as related to the bacteriological findings in the cases, which is regarded as tantamount to the relationship to apparent arrest or activity of the disease. Of the 56 lepromatous cases that were bacteriologically positive, the titers ranged higher than normal in 33 cases (58.9%).

In the series reported here the Maillard complement fixation test showed a significantly lesser number of positive reactors than did the modified hemagglutination test of Middlebrook and Dubos. Although both tests are nonspecific, it is found that among persons with leprosy there are more positive reactors than among normal controls.

#### SUMMARY

1. The Maillard-Gagliardo complement fixation test was performed on sera obtained from 100 cases of leprosy in which a diagnosis of tuberculosis had been excluded.
2. Normal controls showed titers up to 10.
3. Titers above normal were found in 44 (44%) of the 100 cases of leprosy.
4. Titers above normal were found in 33 (58.9%) of the 56 bacteriologically positive cases of lepromatous leprosy.

5. The following comparison is made: (a) modified Middlebrook-Dubos hemagglutination test: 88.5 per cent of the leprosy cases tested showed titers above normal; (b) Maillard-Gagliardo complement fixation test: 44 per cent of the leprosy cases tested showed titers above normal.

#### RESÚMEN

1. La prueba de fijación de complemento Maillard-Gagliardo se hizo en sueros de 100 casos de lepra en los cuales el diagnóstico de tuberculosis había sido excluido.
2. Los testigos normales demostraron titulación hasta 10.
3. Titulaciones sobre los niveles normales ocurrieron en 44 (44%) de los 100 casos de lepra.
4. Titulaciones sobre los niveles normales ocurrieron en 33 (58.9%) de 56 casos bacteriológicamente positivos de lepra lepromatosa.
5. Se puede hacer la siguiente comparación: (a) la prueba de hemaglutinación Middlebrook-Dubos fué sobre el nivel normal en 88.5% de los casos de lepra; (b) la prueba de fijación de complemento Maillard-Gagliardo fué sobre en nivel normal en 44% de los casos de lepra.

#### REFERENCES

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4. ROSS, SISTER HILARY. The results of a modified Middlebrook-Dubos hemagglutination test in leprosy. *Internat. J. Leprosy* **22** (1954) 174-180.