

C-REACTIVE PROTEIN IN LEPROSY

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C-reactive protein (CRP) in the blood serum was first reported by Tillet and Francis in 1930 (5). This protein, which precipitates with the somatic C polysaccharide of the pneumococcus, does not appear in the sera of healthy individuals. There have been reports of findings of CRP in the sera of patients with tuberculosis. One report (4) showed a high percentage of positives, and one (3) a moderate percentage. In my series of 35 patients with tuberculosis I found 7 positives (2). Because of the similarity in the acid-fastness of the organisms of tuberculosis and leprosy, it was felt worth while to examine the sera of leprosy patients.

In patients with nodular leprosy, the sedimentation rate is usually highly elevated due to tissue reaction and inflammation. In neural leprosy, the sedimentation rate is usually low as there is very little inflammatory reaction. Complications in either type of the disease naturally increase the sedimentation rate. It was thought that, although the CRP test might give positive results only in the presence of complications, a series of patients should be tested.

MATERIAL AND METHOD

The method of Anderson and McCarty (1) was followed. The CRP antigen was obtained from Difco Laboratories.¹

With the cooperation of the personnel of the Nagashima Aisei-en in Okayama, I was able to test the blood of 104 patients, 31 with neural leprosy and 73 with the nodular form.² Besides the CRP test, red-cell sedimentation and hematocrit determinations were made in all cases. Although this was a single isolated test for CRP of each individual, it was felt that it should be possible to show a trend which would indicate whether further investigation would be worth while.

RESULTS

Of the 31 patients with neural leprosy tested, 12, or 35 per cent, gave positive CRP reactions, 6 of them over one-plus (1+). All of those with the stronger reactions had complications, such as trophic ulcers or pulmonary tuberculosis, as shown in the first section of Table 1.

Of the 73 patients with nodular leprosy tested, there were 39 positives, or 53 per cent, of which number 24 had reactions over one-plus. Of these 24 cases, 11 had complications, i.e., ulcers or tuberculosis, as shown in the second section of the table. The remainder were free from

¹Difco Bacto C-protein antiserum, code 0671.

²This work having been done in a Japanese institution, the classification terminology used there is employed in this report.

TABLE 1.—Data on the 51 cases out of the 104 tested which gave positive tests for C-reactive protein.

Case No.	R.C. sedimentation	Hematocrit	Corrected	C-reactive protein	Complication
Neural cases (12 of 31)					
2	2	44		2+	Trophic ulcer
5	1	53		1+	None
8	3	38		1+	None
10	42	32	18	2+	TB
19	1	41		1+	None
33	35	33	20	3+	Trophic ulcer
36	2	45		2+	Trophic ulcer
37	3	45		6+	Trophic ulcer
75	39	39	26	4+	Burn of hand
82	4	45		1+	None
93	51	35	21	1+	None
105	30	40	20	1+	Amputated leg
Nodular cases (39 of 73)					
1	11	34		2+	TB, trophic ulcer
7	1	46		1+	Cancer & TB
14	5	36		1+	TB, stable
18	10	37		2+	Trophic ulcer
21	4	36		2+	None
23	2	46		5+	Neuralgia
24	9	39		6+	None*
27	14	39	5	2+	None
28	55	30	23	4+	None
31	4	32		3+	None
32	18	34	8	1+	Trophic ulcer
34	47	33	29	4+	After rhinoplasty
35	2	43		1+	Trophic ulcer
39	2	43		1+	Trophic ulcer
40	2	37		3+	Ulcers feet, open TB
41	2	42		2+	Trophic ulcer
44	10	34	5	1+	Trophic ulcer
45	2	34		2+	None
47	2	42		3+	Lepra reaction
50	13	35		3+	Neuralgia, erythema (Absorptive stage)
51	1	43		1+	None
55	21	36	7	1+	None
56	5	45		1+	Prostate hypertrophy
58	15	32		2+	Diabetes mellitus
60	36	33	14	3+	After hemorrhoidect.
64				2+	Bronchial asthma
67	39	35	20	1+	TB
69				2+	Perivasc. disease
72	23	40	14	1+	None
73	53	31	23	3+	None
76	3	45		4+	TB
78	45	38	29	3+	None
79	43	41	32	3+	None
81	8	47		1+	Ulcers
84	27	39	16	1+	Neuralgia
85	57	29	29	4+	Neuralgia
89	24	35	13	1+	Cholelithiasis
97	40	40	28	2+	New nodules
104	43	37	33	1+	Eczema

complications. Nodules, flocculations of the eye, and blindness were not considered complications, but simply a part of the disease process.

SUMMARY

Tests for C-reactive protein, and sedimentation-rate and hematocrit determinations, were made on 104 patients with neural or nodular leprosy.

Of the 31 patients with neural leprosy, 12 gave positive CRP reactions, 6 of them over one-plus. All of these 6 had complications. It is interesting to note, however, that only 3 of the cases with the stronger reactions showed elevation of the sedimentation rate. In 2 whose reactions were 1+ the sedimentation rate was elevated.

In the nodular leprosy group of 73 patients, 39 were positive for CRP, 24 of them over one-plus. Of these 24 with the stronger reactions, only 12 had complications, and only 9 showed an elevation of the sedimentation rate. In 5 whose reactions were 1+ the sedimentation rate was over 20.

CONCLUSIONS

The test for C-reactive proteins was made on sera from 104 patients with either neural or nodular leprosy. It was not expected that the CRP reaction would be positive in neural leprosy except in patients with complications. All of the patients in this group whose reactions were over one-plus showed complications. In nodular leprosy one would expect to find positive CRP reactions in the active cases and in those with complications. More than 50 per cent of the nodular patients were positive. Of the 24 whose reactions were over one-plus, only 12 had complications.

The sedimentation rate was elevated in only 19 of the CRP-positive patients. It is my feeling that the CRP test is a more accurate guide to the progress of complications in leprosy than the sedimentation rate. In determining whether a patient, particularly one with nodular leprosy, has become completely inactive, routine monthly testing is indicated.

Although the patients in this study were tested only once, I am inclined to believe that the CRP test will be used in the future not only to determine when complications are present in a leprosy patient but also to determine when he is completely recovered and ready for discharge.

RESUMEN

En 104 enfermos que tenían lepra neural o nodular se ejecutaron pruebas para la proteína C-reactiva y determinaciones de la velocidad de eritrosedimentación y de los valores del hematócrito.

De los 31 enfermos de lepra neural, 12 tuvieron reacciones PCR positivas, 6 de ellos de más de uno más. Todos estos 6 tenían complicaciones. Sin embargo, es interesante notar que sólo 3 de los casos que mostraron las reacciones más intensas revelaron elevación del coeficiente de eritrosedimentación. En 2 cuyas reacciones eran de 1+ este coeficiente se hallaba elevado.

En el grupo de 73 enfermos de lepra nodular, 39 fueron positivos para la PCR, 24 de ellos con reacciones de más de 1+. De estos 24 con las reacciones más intensas, sólo 12 tenían complicaciones y únicamente 9 mostraron elevación del coeficiente de eritrosedimentación. En 5 cuyas reacciones eran de 1+ el coeficiente de eritrosedimentación excedió de 20.

Aunque los enfermos de este estudio no fueron comprobados más que una vez, el A. se inclina a creer que la prueba de la PCR se usará en el futuro no sólo para determinar cuándo existen complicaciones en un leproso sino también para determinar cuándo se halla completamente curado y dispuesto para el alta.

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ADDENDUM: Since this manuscript was submitted for publication it has been learned that one report on C-reactive protein in leprosy has previously been published by A. S. Rabson, in this periodical, **23** (1955) 158-161.

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