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Reactions to Antigens from Actinomycetes Including *Mycobacterium leprae* in Leprosy Patients

To the Editor:

Several investigators have discussed the possibility that contact with bacteria cross-reacting with *Mycobacterium leprae* is of importance for the development of leprosy ([5]). It has also been claimed that exposure to such organisms influences the clinical type of leprosy which develops ([2]). Not only mycobacteria, but also many other actinomycetes share antigens with the leprosy organism ([4]).

The present communication gives a brief account of a study in which the humoral and cellular immune responses in leprosy patients and healthy controls to various actinomycetes antigens were investigated. The effect of *M. leprae* antigens on the cellular response to some of these antigens was also studied.

Analyses of the humoral immune response. Sera from 51 leprosy patients (clinical types are given in The Table) and 30 healthy controls from Sweden and Ethiopia were analyzed, using antigen preparations from 21 strains of *Nocardia, Nocardiopsis, Streptomyces, Streptoverticillium* (collectively referred to as streptomycetes), from four strains of *Mycobacterium,* and from *M. leprae.* The serological method used was immunodiffusion and the results are given in The Table. The analyses demonstrated that antibodies against antigens from streptomycetes are common in leprosy patients as well as in healthy controls, while antibodies against mycobacteria only are common in lepromatous patients, but not in tuberculoid or healthy controls.

Analyses of the cellular immune response. The responses to the above-mentioned antigen preparations were analyzed by a lymphoproliferation assay ([1]) using peripheral blood mononuclear cells from six border-

THE TABLE. *Number of sera reacting with the bacterial antigen preparations.*

Serum class[a]	Total no.	Antigen preparations: 21 Streptomycetes	4 Mycobacteria (except *M. leprae*)	*M. leprae*
LL	17	14	17	13[b]
BL	16	8	11	13
BT	16	2	0	2
TT	2	0	0	0
He Et	15	4	1	0[c]
He Sw	15	6	1	0[d]

[a] LL = lepromatous leprosy; BL = borderline lepromatous; BT = borderline tuberculoid; TT = tuberculoid; He Et = healthy Ethiopians; He Sw = healthy Swedes.
[b] Only 15 tested.
[c] Only 9 tested.
[d] Only 12 tested.

line tuberculoid patients and nine lepromatous patients (BL or LL). Most of the streptomycetes antigens tested did not induce proliferative cellular response in either tuberculoid or lepromatous leprosy patients, while most patients responded to the antigens from mycobacteria (apart from *M. leprae* in lepromatous patients). However, a limited number of streptomycetes antigens were recognized by the cells, but the responders were randomly distributed between the two patient groups (Fig. 1). A similar response was obtained when the antigen preparation from the environmental strain of *M. phlei* was tested (Fig. 1). The investigations thus indicate that the presence of streptomycetes and certain mycobacteria in the environment is not of importance for the development of leprosy in spite of the fact that these organisms share antigens with *M. leprae* and humans produce antibodies against them.

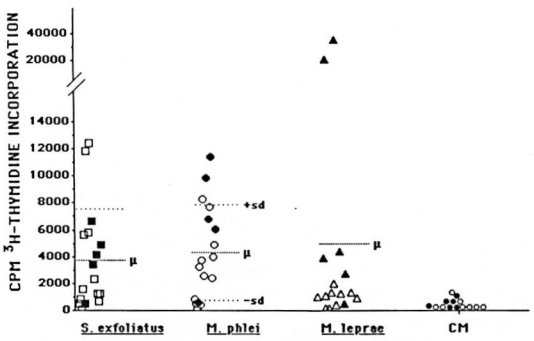

FIG. 1. Lymphoproliferative responses to *S. exfoliatus* □, *M. phlei* ○, *M. leprae* △, and culture medium (CM, ○) in lepromatous (open symbols) and tuberculoid (solid symbols) leprosy patients. Statistically significant differences in responsiveness between the two groups were only for responses to *M. leprae* ($p < 0.025$). Cellular responses to other *Streptomycetes* antigens were only observed sporadically. Three healthy Ethiopian controls responded only to mycobacterial antigens (not shown).

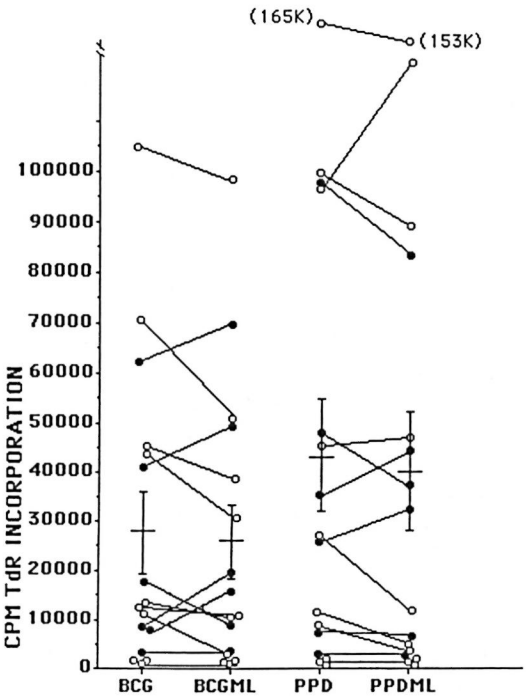

FIG. 2. Selective reduction of responsiveness to BCG but not PPD in cells from lepromatous but not tuberculoid leprosy patients in the presence of *M. leprae*. Peripheral blood mononuclear cells of leprosy patients were incubated with mycobacterial antigens in the presence (i.e., BCGML or PPDML) or absence (i.e., BCG or PPD) of *M. leprae*. Solid circles represent tuberculoid patients and open circles, lepromatous leprosy patients.

The effect of the presence of *M. leprae* on the cellular immune response to streptomycetal and mycobacterial antigens was also investigated. Significant reduction of responses to BCG and *Streptomyces exfoliatus* was observed, but not to the other organisms tested, nor to PPD or PHA, and only in lepromatous not in tuberculoid patients (Fig. 2). These findings make the hypothesis that such depressions are due to endotoxin ([3]) less likely. The results further

suggest a specific interaction between BCG, *M. leprae,* and lymphocytes from lepromatous patients. In view of the use of the mixture of BCG and *M. leprae* as a vaccine, the interaction of these two antigens merits further investigation.

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Precautionary Note for Observing Signs of Activity (or Relapse) in Treated Leprosy Patients

To the Editor:

We would like to bring to the attention of leprosy workers two points which appear to be of significance when reviewing treated leprosy patients for signs of the disease.

A 22-year-old man had a borderline tuberculoid plaque of leprosy on the upper part of his left forearm. After 6 months of regular treatment with multidrug therapy (MDT), rifampin 600 mg monthly supervised and dapsone 100 mg daily unsupervised, the plaque subsided well and he was kept under surveillance. During the third month of surveillance, he reported with mildly pruritic, erythematous and scaly lesions on the site where the leprosy plaque had been (The Figure). The lesions were of 5 weeks' duration and did not look like those of leprosy. A scraping for fungus in 10% potassium hydroxide was negative. He was advised to apply topical betamethasone valerate and to take oral antihistaminic tablets. Within a month the lesions regressed, removing all fear from the patient's mind. A similar occurrence was seen in two more patients with tuberculoid leprosy after a 2-year surveillance period. Although these cases are seen in rare instances, it is important to recognize them so that benign lesions are not confused with signs of lep-