

Thesis Title: Effect of chemotherapy on the T-cell
subpopulations' distribution patterns
in leprosy

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ABSTRACT

The specific unresponsiveness of lepromatous patients to *M. leprae* antigens has been reported to be due to several immunological perturbations. One of these is the induction of T-suppressor cells leading to an inversion in the T-helper to T-suppressor cell ratio. Untreated multibacillary patients were shown to have increased in their T-suppressor population and decreased in the T-helper cells. It has been shown in several studies that with treatment of these multibacillary patients, the T-cell subsets' imbalance normalizes as a direct result of the decreasing antigenic load. It is in this regard that the present study has undertaken the task of determining the distribution patterns of the 2 main T-

cell subsets during the different phases of treatment of these patients. Such distribution patterns if established could perhaps be used as one of the parameters in assessing the effectiveness of treatment among these patients.

In the study, seventeen normal individuals and 31 leprosy patients all on current chemotherapy were studied for T11, T4, T8 and T4/T8 cell ratios. The T-cells were enumerated using monoclonal antibodies for T-cell subsets in the indirect immunofluorescence technique. The results showed that the bacteriologically negative patients (group B) did not have significantly different T11 from the two acid-fast bacillus (AFB) positive groups of patients, i.e., group C, with 9-11 months of treatment and group D, over two years of treatment. The T4/T8 cell ratios of the three groups of leprosy patients were however shown to be significantly different from each other, supporting a previous observation that the defect is not on the absolute number of circulating T-cells but more of a functional abnormality.

The AFB negative patients (group B) were shown to have improved T4/T8 ratio, albeit still significantly lower than those of the normal subjects. This is consistent with the observation that the T-cell subsets' balance normalizes as treatment progresses. The AFB positive dapsone sensitive patients (group C) showed the lowest T4/T8 ratio and this is in accordance with their

still high bacterial load, consistent with the short duration of treatment in this group of patients. On the other hand, the AFB positive but dapsone resistant patients (group D) showed the highest T4/T8 ratio, even much higher than those registered by the normal subjects. The behavior of group D is similar to the "rebound phenomenon" which has also been observed among patients who have been on regular treatment and experiencing a consistent decline in the bacterial index. Such phenomenon was also demonstrated in lepromatous patients undergoing erythema nodosum leprosum.

On the whole, the results of the study were consistent with those of some previous works. Although a much thorough analysis is suggested for the exaggerated increase in the T4/T8 ratio in group D. Other factors could have played a role in this, such as the possible "homing" of cells from tissues to the peripheral blood. At this point in time however, it is difficult to make any definite conclusion on it. Moreover, the potential of using the distribution patterns of the T-cell subsets in assessing the immune status of the patients undergoing treatment was not clearly seen with the results obtained. A longitudinal study is needed to set up a trend, and perhaps a more significant analysis of the problem could be obtained if the T-cells in the tissues could be simultaneously studied with those in the peripheral blood.