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Clinical and Chemokine Profile in Leprosy Patients During Multidrug Therapy (MDT) and Their Healthy Contacts: A Randomized Control Trial

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Abstract : Background: Leprosyis a chronic granulomatous diseasecaused by Mycobacterium leprae (M. Lepra). Reactions may interrupt its usual chronic course.Type-1 (T1R)and type-2 lepra reaction(T2R) are acute events and signifytype-IV and type-III hypersensitivity responses, respectively. Various chemokines like CCL3, 5, 11, and CCL24 may be increased during the course of leprosy or during reactions and may serve as markers of early diagnosis, response to therapy, and prognosis. Objective: To find correlation of CCL3, 5, 11, and CCL24 in leprosy patients on multidrug therapy and their family contacts after ruling out active disease during leprosy treatment and during periods of lepra reactions. Methodology: This randomized control trial was conducted in 50 clinico-histopathologically diagnosed cases of leprosy in a tertiary care hospital in Bengaluru, India. 50 of their family contacts were adequately examined and investigated should the need be to rule out active disease. The two study-groups comprised of leprosy cases, and the age, sex, and area of residence matched healthy contactswho were given single-dose rifampicin prophylaxis, respectively. Blood samples were taken at baseline, six months, and after one yearin both the groups (on completion of MDT in leprosy cases)and also during periods of reaction if occurred in leprosy cases. Results: Our study found that at baseline, CCL5, 11, and 24 were higher in leprosy cases as compared to the healthy contacts, and the difference was statistically significant.CCL3 was also found to be higherat baseline in leprosy cases, however, the difference was not statistically significant. At six months and one year, the levels of CCL 5, 11, and 24 reduced, and the difference was statistically significant in leprosy cases, whereas it remained almost static in all the healthy contacts. Twenty patients of leprosy developed lepra reaction during the course of one year, and during reaction, the increase in CCL11 and 24 was statistically significant from baseline, whereas CCL3 and 5 did not rise significantly. One of the healthy contacts developed signs of leprosy in the form of hypopigmented numb patch and was clinico-histopathologically, and CCL11 and 24 were found to be higher with a statistically significant difference from the baseline values. Conclusion: CCL5, 11, and 24 are sensitive markers of diagnosing leprosy, response to MDT, and prognosis and are not increased in healthy contacts. CCL11 and 24 are sensitive markers of lepra reactions and may serve as one of the early diagnostic modalities for identifying lepra reaction and also leprosy in healthy contacts. To the best of our knowledge, this is the first study to evaluate these biomarkers in leprosy cases and their healthy contacts with a follow-up of upto one year with one of them developing the disease, and the same was confirmed based on these biomarkers as well.

Keywords : chemokine profile, healthy contacts, leprosy, lepra reactions
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