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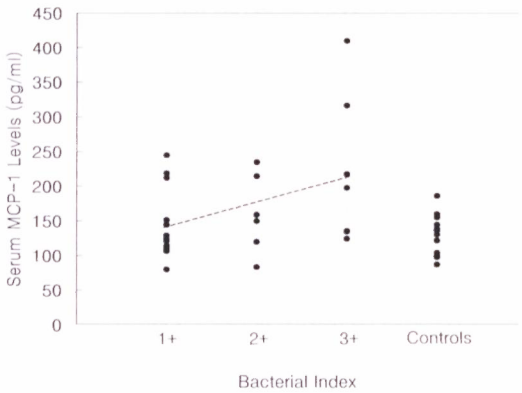
Serum Monocyte Chemoattractant Protein-1 is Elevated in Lepromatous Leprosy Patients with High Bacterial Indices

To the Editor:

The immunologic basis of the polar types of leprosy is explained by the differences of cytokine expressions in the lesions. Increased interferon (IFN)-γ and interleukin (IL)-2 mRNAs were reported in tuberculoid leprosy lesions, and IL-4 and IL-10 mRNAs are known to be elevated in lepromatous leprosy lesions ([9]). So far, serum levels of tumor necrosis factor (TNF)-α, IL-2 receptor, IL-10, IL-1β and IL-1 receptor antagonist have been reported to be elevated in lepromatous leprosy ([2, 5, 6]). Considering that the skin infiltrating cells of lepromatous leprosy are mainly composed of macrophages, chemokines seem to be responsible for the recruitment of these cells.

Therefore, we tested for several chemokines namely monocyte chemoattractant protein (MCP)-1, macrophage-derived chemokine (MDC), thymus and activation-regulated chemokine (TARC) and eotaxin, in addition to IL-12 and IL-10. ELISA assay systems were used for the detection of TARC (TECHNE Co. Minneapolis, Minnesota, U.S.A.) and the others (R&D Systems Inc., Minneapolis, Minnesota, U.S.A.). Twenty-eight leprosy patients (mean age: 50.6 years, M:F = 25:3) and fourteen healthy controls (mean age: 42.8 years M:F = 1:13) were studied in Korea. The leprosy patients were all of the polar lepromatous (LL) type ([8]) with positive bacterial index (BI). The patients were composed of 13 (BI 1+), 6 (BI 2+), 7 (BI 3+) and 2 (BI 4+) patients. The higher BI numbers represent greater bacteria numbers (1+ = 1–10



THE FIGURE. Serum levels of MCP-1 in lepromatous leprosy patients on the basis of bacterial indices (BI) from 1 to 3. Each group was composed of 13 (BI 1+), 7 (BI 2+) and 6 (BI 3+) patients, and 14 healthy controls. Data are presented as mean ± SD (BI 1+ = 143.54 ± 50.3; BI 2+ = 159.9 ± 56.9; BI 3+ = 219.2 ± 107.8; healthy controls = 127.9 ± 28.5). Regression analysis was statistically significant (p = 0.0363).

bacteria in 100 fields; 2+ = 1–10 bacteria in 10 fields; 3+ = 1–10 bacteria in an average field; 4+ = 10–100 bacteria in an average field; 5+ = 100–1000 bacteria in an average field; 6+ = >1000 or many clumps of bacteria in an average field) in the tissue fluid from a slit-skin lesion smear, and these were counted in oil-immersion fields by light microscopy ([7]). The patients had been treated with dapsone, rifampin and/or clofazimine. The other associated diseases in the patients were tuberculosis in two, chronic hepatitis in one, chronic gastritis in one, bone exposure in one and osteomyelitis in one. Student's t test (two-tailed) and regression analysis were used for statistical analysis using the SAS program. Among the tested serum levels of MCP-1, MDC, TARC, eotaxin, IL-12 and IL-10, only the MCP-1 level of LL patients with high BI (2 to 4+) was significantly higher than that of the healthy controls (184.14 ± 85.98 versus 127.98 ± 28.53, p = 0.0282). Regression analysis based on BI 1 to 3+ was statistically significant (p = 0.0363) (The Figure). Two patients of BI 4+ were omitted for regression analysis due to the inadequate numbers for statistical analysis. The serum MCP-1 levels of LL patients with low BI (1+) were not different from those of the healthy controls. Serum MDC, TARC, eotaxin, IL-12 and IL-10 levels of either LL patients with high BI (2 to 4+) or LL patients with low BI (1+) were not significantly different from the healthy controls (data not shown).

Serum MCP-1 levels are known to be significantly correlated with the serum angiotensin converting enzyme (ACE) levels in sarcoidosis ([4]). Serum ACE is known to be elevated in leprosy, and that this is roughly proportional to the extent of infection ([1]). Therefore, it is conceivable that the elevation of serum MCP-1 in leprosy correlates with the severity of the disease. Although the significance of increased serum MCP-1 in leprosy patients is unknown, the reduction of experimental granuloma by anti-MCP-1 antiserum *in vivo* suggests that increased serum MCP-1 levels in leprosy are due to granuloma formation ([3]). Increased serum IL-10 is reported in patients having lepromatous leprosy and ENL ([5]). However, we could not observe any differences in the serum IL-10 levels in each group of LL patients versus the healthy controls (data not shown).

In conclusion, we found that serum MCP-1 levels are elevated in lepromatous leprosy patients with high BI, and that this correlates with disease severity.

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