

Circulating Cytokines/Chemokines and Neutrophils Function in Patients with Fibromyalgia Syndrome

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ABSTRACT: BACKGROUND: Fibromyalgia syndrome (FMS) is a widespread musculoskeletal pain and fatigue disorder for which the cause is still unknown. Fibromyalgia means pain in the muscles, ligaments, and tendons of the soft fibrous tissues in the body. FMS lacks objective, analytic imaging or pathological data. The fibromyalgia classification criteria of the American College of Rheumatology are not diagnostic criteria. **OBJECTIVE:** The aim of the present study was to investigate the changes of circulating cytokines/chemokines and neutrophils function in FMS patients. **METHODS:** Plasma IL-1 β , IL-1RA, IL-2, IL-2R, IL-4, IL-5, IL-6, IL-7, IL-8, IL-10, IL-12, IL-13, IL-15, IL-17, TNF α , IFN α , IFN γ , GM-CSF, MIP-1 α , MIP-1 β , MIG, eotaxin, RANTES, MCP-1, and IP-10 were determined in 14 female FMS patients and 9 female healthy volunteers. Neutrophils surface markers, eosinophils/neutrophils ratio, and neutrophils apoptosis were measured by flow cytometry. **RESULTS:** There was statistically significant increase in plasma eotaxin in FMS patients ($p < 0.001$) and there were significant decreases in plasma IL-4, IL-5, IL-8, IL-13, IL-17, IFN α , IFN γ , GM-CSF, MIG, MIP-1 β , and IL-2R. The ratios of eotaxin/IL-4, eotaxin/IL-5, eotaxin/IL-13, eotaxin/IFN γ , eotaxin/TNF α , eotaxin/MIG, eotaxin/IL-8, eotaxin/MIP-1 α , and eotaxin/MIP-1 β were all increased significantly in comparison with control ($p < 0.05$ or $p < 0.01$). Eotaxin was found to be negatively related to IL-4 ($r = -0.706$, $p < 0.01$), IL-13 ($r = -0.630$, $p < 0.05$), IFN γ ($r = -0.591$, $p < 0.05$), MIG ($r = -0.555$, $p < 0.05$), IL-17 ($r = -0.654$, $p < 0.05$), IL-8 ($r = -0.669$, $p < 0.01$), and MIP-1 β ($r = -0.762$, $p < 0.01$). Neutrophils surface CD66 (activated marker), CDw128a (chemoattractant IL-8 receptor), CD11b (integrin αM), CD18 (integrin $\beta 2$), CD16 (Fc γ RIII) were significantly decreased in FMS patients ($p < 0.01$). The increase of ratio of eosinophils/neutrophils was not statistically significant in FMS patients. Apoptosis (18h) of neutrophils and their respond to LPS showed no significant differences between FMS patients and healthy volunteers. **CONCLUSION:** This study shows that eotaxin, as a chemoattractant for eosinophils, basophils, neutrophils, and macrophages, is significantly increased. Its positive regulators, for example, IL-4, IL-5, IL-13, IFN γ , and GM-CSF, and its natural receptor antagonist MIG are significantly decreased in FMS patients. Plasma IL-8 (Chemoattractant for neutrophils) and MIP-1 β (chemoattractant for monocytes), neutrophils surface CDw128a (IL-8 receptor), CD11b and CD18 (adherent molecules of migration), CD66 (activated markers), and CD16 (a low affinity receptor for aggregated IgG) are significantly decreased. These findings have very important roles in the next step study for pathogenesis and therapy strategy in patients with FMS in the future.