

## **Mixed mold mycotoxicosis: immunological changes in humans following exposure in water-damaged buildings.**

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**Abstract:** The study described was part of a larger multicenter investigation of patients with multiple health complaints attributable to confirmed exposure to mixed-molds infestation in water-damaged buildings. The authors present data on symptoms; clinical chemistries; abnormalities in pulmonary function; alterations in T, B, and natural killer (NK) cells; the presence of autoantibodies (i.e., antinuclear autoantibodies [ANA], autoantibodies against smooth muscle [ASM], and autoantibodies against central nervous system [CNS] and peripheral nervous system [PNS] myelins). A total of 209 adults, 42.7 +/- 16 yr of age (mean +/- standard deviation), were examined and tested with (a) self-administered weighted health history and symptom questionnaires; (b) standardized physical examinations; (c) complete blood counts and blood and urine chemistries; (d) urine and fecal cultures; (e) thyroid function tests (T4, free T3); (f) pulmonary function tests (forced vital capacity [FVC], forced expiratory volume in 1 sec [FEV1.0], and forced expiratory flow at 25%, 50%, 75%, and 25-75% of FVC [FEF25, FEF50, FEF75, and FEF2(25-75)]); (g) peripheral lymphocyte phenotypes (T, B, and NK cells) and mitogenesis determinations; and (h) a 13-item autoimmune panel. The molds-exposed patients reported a greater frequency and intensity of symptoms, particularly neurological and inflammatory symptoms, when compared with controls. The percentages of exposed individuals with increased lymphocyte phenotypes were: B cells (CD20+), 75.6%; CD5+CD25+, 68.9%; CD3+CD26+, 91.2%; CD8+HLR-DR+, 62%; and CD8+CD38+, 56.6%; whereas other phenotypes were decreased: CD8+CD11b+, 15.6% and CD3-CD16+CD56+, 38.5%. Mitogenesis to phytohemagglutinin was decreased in 26.2% of the exposed patients, but only 5.9% had decreased response to concanavalin A. Abnormally high levels of ANA, ASM, and CNS myelin (immunoglobulins [Ig]G, IgM, IgA) and PNS myelin (IgG, IgM, IgA) were found; odds ratios for each were significant at 95% confidence intervals, showing an increased risk for autoimmunity. The authors conclude that exposure to mixed molds and their associated mycotoxins in water-damaged buildings leads to multiple health problems involving the CNS and the immune system, in addition to pulmonary effects and allergies. Mold exposure also initiates inflammatory processes. The authors propose the term "mixed mold mycotoxicosis" for the multisystem illness observed in these patients.

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