

Featured Research Studies

Regional differences in residential environments and the association of dwellings and residential factors with the sick house syndrome: a nationwide cross-sectional questionnaire study in Japan.

Kishi R, Saijo Y, Kanazawa A, Tanaka M, Yoshimura T, Chikara H, Takigawa T, Morimoto K, Nakayama K, Shibata E.

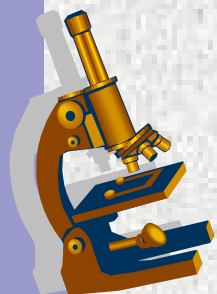
Indoor Air. 2009 Jun;19(3):243-54. Epub 2009 Jan 19.

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This study was conducted to clarify regional differences in residential factors and the association of those factors with dwellings having sick house syndrome (SHS) problems. The survey was conducted in six areas of northern and southern Japan. In terms of regional differences, dampness was not as severe in the dwellings in Sapporo as compared with that in areas in the south. SHS was defined using five categories of nasal, throat and respiratory, skin and general symptoms, which appeared frequently or not frequently and improved upon leaving the home. The dampness index was estimated by the sum of the presence of several indicators: condensation on the window panes and/or wall, visible mold growth, moldy odor, slow-drying wet towels in the bathroom, and water leakage. The dwellings where inhabitants showed any symptoms of SHS comprised 3.7% of all surveyed dwellings. We found significant associations between SHS and dampness index, odors, and stuffiness of the air. For dampness, the adjusted odds ratio (OR) increased with increased dampness index, adjusting for the age of the house, pets indoors, stuffiness of the air, and odors. These results showed an increased risk when several dampness indicators appeared simultaneously.

PRACTICAL IMPLICATIONS: To evaluate the associations of residential environments and Sick House Syndrome (SHS), this cross-sectional questionnaire study was conducted on 2297 dwellings in six areas in Japan from 2003 to 2004. The dwellings where inhabitants showed any of nasal, throat and respiratory, skin and general symptoms comprised 3.7% of all surveyed dwellings, and an increased risk for SHS was found when several dampness indicators, 'condensation', 'visible mold growth', 'moldy odor', 'slow drying wet towels in the bathroom' and 'water leakage', appeared simultaneously.

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Mycotoxin Detection in Human Samples from Patients Exposed to Environmental Molds

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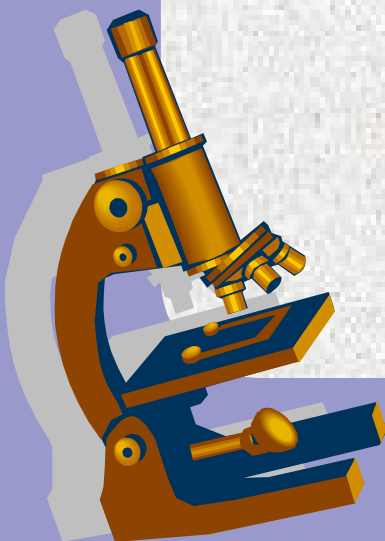
Abstract

The goal of this study was to determine if selected mycotoxins (trichothecenes, aflatoxins, and ochratoxins) could be extracted and identified in human tissue and body fluids from patients exposed to toxin producing molds in their environment.

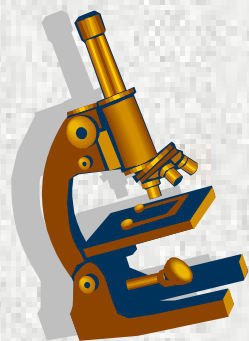
Human urine and methanol extracted tissues and sputum were examined. Trichothecenes were tested using competitive ELISA techniques. Aflatoxins B1, B2, G1, and G2, and ochratoxin A were tested by using immunoaffinity columns and fluorometry. Test sensitivity and specificity were determined.

Levels of detection for the various mycotoxins varied from 0.2 ppb for trichothecenes, 1.0 ppb for aflatoxins, and 2.0 ppb for ochratoxins. Trichothecene levels varied in urine, sputum, and tissue biopsies (lung, liver, brain) from undetectable (<0.2 ppb) to levels up to 18 ppb. Aflatoxin levels from the same types of tissues varied from 1.0 to 5.0 ppb. Ochratoxins isolated in the same type of tissues varied from 2.0 ppb to > 10.0 ppb.

Negative control patients had no detectable mycotoxins in their tissues or fluids. These data show that mycotoxins can be detected in body fluids and human tissue from patients exposed to mycotoxin producing molds in the environment, and demonstrate which human tissues or fluids are the most likely to yield positive results.



Mitochondrial dysfunction, impaired oxidative-reduction activity, degeneration, and death in human neuronal and fetal cells induced by low-level exposure to thimerosal and other metal compounds



D. A. Geier; P. G. King; M. R. Geier

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Abstract

Thimerosal (ethylmercurithiosalicylic acid), an ethylmercury (EtHg)-releasing compound (49.55% mercury (Hg)), was used in a range of medical products for more than 70 years. Of particular recent concern, routine administering of Thimerosal-containing biologics/childhood vaccines have become significant sources of Hg exposure for some fetuses/infants. This study was undertaken to investigate cellular damage among in vitro human neuronal (SH-SY-5Y neuroblastoma and 1321N1 astrocytoma) and fetal (nontransformed) model systems using cell vitality assays and microscope-based digital image capture techniques to assess potential damage induced by Thimerosal and other metal compounds (aluminum (Al) sulfate, lead (Pb)(II) acetate, methylmercury (MeHg) hydroxide, and mercury (Hg)(II) chloride) where the cation was reported to exert adverse effects on developing cells. Thimerosal-associated cellular damage was also evaluated for similarity to pathophysiological findings observed in patients diagnosed with autistic disorders (ADs). Thimerosal-induced cellular damage as evidenced by concentration- and time-dependent mitochondrial damage, reduced oxidative-reduction activity, cellular degeneration, and cell death in the in vitro human neuronal and fetal model systems studied. Thimerosal at low nanomolar (nM) concentrations induced significant cellular toxicity in human neuronal and fetal cells. Thimerosal-induced cytotoxicity is similar to that observed in AD pathophysiological studies. Thimerosal was found to be significantly more toxic than the other metal compounds examined. Future studies need to be conducted to evaluate additional mechanisms underlying Thimerosal-induced cellular damage and assess potential co-exposures to other compounds that may increase or decrease Thimerosal-mediated toxicity.

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