

Chemicals- resource information post testing

By Claire Riendeau, N.D., N.M.D.

Chemicals like benzene, formaldehyde (FMA), toluene di-isocyanate and trimellitic anhydride have been implicated in a variety of disturbances of essential physiological pathways. Even when not principally causative, these chemicals are sufficiently disruptive to cause physiological upset.

With increasing frequency, vague and puzzling symptoms are being ascribed, at least partially, to abnormally high levels of chemicals. When these chemicals evoke an immune (antibody) response, it means that the body has attached specific liver enzymes to the chemical thus forming an antigen complex of the chemical.

Antibody to a chemical clearly indicates the body's inability to clear the chemical and is therefore the best method of differentiating a potentially serious chemical exposure and toxicity problem. The antibodies that form in response to the chemical/enzyme complex are evidence of risk for autoimmune and potentially significant physiological pathway alteration and possible metabolic toxicity.

The result can be an increased likelihood of a variety of illnesses including chronic degenerative disorders, including autoimmune conditions, cancer and cardiovascular disease.

Benzene is an aromatic hydrocarbon that is produced by the burning of natural products. It is a component of products derived from coal and petroleum and is found in gasoline and other fuels. Benzene is used in the manufacture of plastics, detergents, pesticides, and other chemicals. Research has shown benzene to be a carcinogen (cancer causing). With exposures from less than five years to more than 30 years, individuals have developed, and died from, leukemia. Long-term exposure may affect bone marrow and blood production. Short-term exposure to high levels of benzene can cause drowsiness, dizziness, unconsciousness, and death. Benzene exposure can come from gasoline, cigarette smoke, motor vehicle exhaust, industrial emissions, glues, paints, furniture wax, pesticides and detergents.

Formaldehyde is common to the chemical industry. During both 1994 and 1995, Chemical & Engineering News reported U.S. production at 8.1 billion pounds. This ranked it 24th overall. It is well known as a preservative in medical laboratories, as an embalming fluid, and as a sterilizer. Its primary use is in the production of resins and as a chemical intermediate. Urea-formaldehyde and phenol formaldehyde resins are used in foam insulations, as adhesives in the production of particle board and plywood, and in the treating of textiles. Formaldehyde exposure can come from glues, permanent press fabrics, paper product coatings, insulation materials, particle board used to build newer houses, fiberboard in cabinets and furniture and cigarette smoke.

Toluene Diisocyanate is commonly used as a chemical intermediate in the production of polyurethane foams, elastomers, and coatings; paints; varnishes; wire enamels; sealants; adhesives; and binders. It is also used as a cross-linking agent in the manufacture of nylon polymers. Toluene diisocyanate is severely irritating to tissues, especially to mucous membranes. Inhalation of toluene diisocyanate produces euphoria, ataxia, mental aberrations, vomiting, abdominal pain, respiratory sensitization, bronchitis, emphysema and asthma. High-concentration inhalation can lead to chest tightness, cough, breathlessness, and inflammation of the bronchi with sputum production and wheezing. Accumulation of fluid in the lungs can also occur. Flu-like symptoms such as fever, malaise, shortness of breath, and cough can develop. Exposure to toluene diisocyanate can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically- or irritant-induced type of asthma. Toluene diisocyanate-containing smoke has been associated with lightheadedness, headache, insomnia, mental aberrations, impaired gait, loss of consciousness, and coma. Toluene diisocyanate can cause eye irritation, inflammation of the eye membrane, inflammation of the cornea, clouding of the eye surface, and secondary glaucoma. Neurologic effects, such as difficulty concentrating, poor memory, and dull headache, have been reported to persist years after high-level exposure. The Department of Health and Human Services has determined that toluene diisocyanate may reasonably be anticipated to be a carcinogen. Patients who are comatose, hypotensive, or having seizures or cardiac arrhythmias should be treated according to advanced life support (ALS) protocols. Low levels of toluene diisocyanate in the air can irritate the eyes, nose, throat, and lungs and cause cough, chest tightness, and shortness of breath. Higher levels can cause a build-up of fluid in the lungs, which may cause death.

Trimellitic anhydride is an irritant and a sensitizing agent which can affect the respiratory system and blood. Trimellitic anhydride is irritating to the respiratory tract, eyes, and skin [ACGIH 1991]. Repeated exposures can result in the development of an allergic reaction [ACGIH 1991]. Three different immune mediated syndromes have been described in workers exposed to trimellitic anhydride. The first condition is an asthma-rhinitis syndrome which consists of an immediate-onset asthma and allergic rhinitis that is mediated by immunoglobulin E [Rom 1992]. The second syndrome is late respiratory systemic syndrome which is a hypersensitivity pneumonitis-like reaction followed by a flu-like syndrome 4 to 12 hours after exposure; this syndrome is associated with moderate exposures [Rom 1992]. The third syndrome is pulmonary disease anemia characterized by dyspnea, hemoptysis, pulmonary infiltrates, restrictive lung function, and hemolytic anemia; this syndrome primarily develops in workers exposed to high levels of trimellitic anhydride.

References:

www.osha.gov/SLTC/benzene/

www.osha.gov/SLTC/formaldehyde/index.html

Agency for Toxic Substances and Disease Registry; www.atsdr.cdc.gov/MHMI/mmg179.html

www.osha.gov/SLTC/healthguidelines/trimelliticacidhydride/recognition.html

Copyright © 2017. All rights reserved. No part of this website may be reproduced or transmitted in any form without the prior written permission of the author.