PUBLIC HEALTH

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Contact us:

chemwatch@chemwatch.net
tel +61 3 9572 4700
fax +61 3 9572 4777

Emergency +61 3 9573 3112

70 Bambra Rd Caulfield North
Victoria 3161 Australia

*While Chemwatch has taken all efforts to ensure the accuracy of information in this publication, it is not intended to be comprehensive or to render advice. Websites rendered are subject to change.
Health risks and benefits of bis(4-chlorophenyl)-1,1,1-trichloroethane (DDT)

This literature reviews the use of DDT (bis[4-chlorophenyl]-1,1,1-trichloroethane), a persistent insecticide. Upon the proposed global banning of DDT in 2001, several countries in sub-Saharan Africa claimed that DDT was still needed as a cheap and effective means for vector control. Although DDT is generally not toxic to human beings and was banned mainly for ecological reasons, subsequent research has shown that exposure to DDT at amounts that would be needed in malaria control might cause pre-term birth and early weaning, abrogating the benefit of reducing infant mortality from malaria. Historically, DDT has had mixed success in Africa; only the countries that are able to find and devote substantial resources towards malaria control have made major advances. The authors conclude that DDT might be useful in controlling malaria, but the evidence of its adverse effects on human health needs appropriate research on whether it achieves a favorable balance of risk vs. benefit.

Authors: Rogan, Walter J.; Chen, Aimin
Full Source: Lancet 2005, 366(9487), 763-773 (Eng)

Effects of glutaraldehyde exposure on human health

2006-06-8

This literature reviews the effects of Glutaraldehyde (GA) exposure on human health. GA is widely used in the industrial, scientific and biomedical fields. Many adverse health effects on humans have been reported in association with biomedical uses of GA. GA solution is generally used for cold sterilization and GA exposure ranges of 0.001 to 2.6 ppm for this type of use. GA is metabolized extensively to CO2, but urinary excretion of it is low. Sensory irritant effects, sensitization of skin and respiratory organs and other symptoms have been reported among endoscopy nurses and medical radiation technologists. The prevalence of chronic bronchitis and nasal symptoms in humans is significantly correlated with peak concentrations of GA exposure. The extent of primary skin irritation depends on the duration and site of contact, and the severity of symptoms is dose-related. Chronic inhalation affects the nose and respiratory tract, and lesions become severe with prolonged duration of exposure. Increases in neither mortality nor tumor incidence have been found in workers with less than 0.2 ppm GA exposure, no evidence of carcinogenic activity has been obtained in experimental animal studies. There has been no clear evidence of genetic toxicity of GA in either in vitro or in vivo studies, and neither developmental nor reproductive toxicity has been found in humans or animals. The authors conclude in order to prevent hazards from GA exposure, use of closed-system, fully automated washing machines is recommended, since numerous symptoms have been found in individuals with less than 0.05 ppm GA exposure, the recommended peak exposure limit in many countries.

Authors: Takigawa, Tomoko; Endo, Yoko
Full Source: Journal of Occupational Health 2006, 48(2), 75-87 (Eng)

The emergence of manganese-related health problems in Quebec: An integrated approach to evaluation, diagnosis, management and control

2006-06-08

This study examines the strategy developed in Quebec to deal with an emerging problem: manganism in welders. Only two cases of manganism had been reported to the Commission de la sante et de la securite du travail...
(CSST, Workers Compensation Board in Quebec) before 2000. In 2001, the CSST was informed of a possible cluster of manganism and received 20 compensation claims from one plant. A literature review was conducted to document the health risks associated with manganese and found some important information lacking. An international panel of experts was formed to try to reach agreement on the parameters to consider in the diagnosis and management of manganism. The CSST compensation management policies would be adjusted accordingly. Simultaneously, all the available industrial hygiene data were analyzed to estimate where and at what levels workers were exposed to manganese. To complete this data, the exposure of workers in more than 50 industrial plants was evaluated and existing control measures were documented. All of the data has been presented for a revision of the Quebec permissible exposure limit (PEL). The authors concluded that the next step targets the formation of neurologists and neuropsychologists for a standardized medical evaluation, to complete workplace evaluation in the high risk sectors, inform workers and employers and recommend control measures where required, based on a revised PEL. Many strategies will be used to inform the prevention network (about 1000 people), employers and employees of the risks of overexposure to manganese and of the measures to control exposure in all the plants where workers are susceptible to be exposed to manganese.

Authors: Ostiguy, Claude; Asselin, Paul; Malo, Sylvain
Full Source: NeuroToxicology 2006, 27(3),350-356 (Eng)

Estimates of acute pesticide poisoning in agricultural workers in less developed countries
2006-06-08
This study examined the acute pesticide poisoning in agricultural workers in less developed countries to draw conclusions on the extent and severity of occupational poisoning. This study involved reviewing the most recent (post-1990) literature. Data was also derived from the World Health Organization (WHO), United Nations Environment Program (UNEP) and the International Labour Office (ILO). The collected information was analyzed to assess the extent and severity of occupational acute pesticide poisoning in less developed countries. Occupational acute pesticide poisonings in these countries are a small proportion of overall reported poisoning and are associated with the more minor effects of pesticides. They are a small proportion (<1-4%) of the several million cases of occupational injuries and ill health in agricultural workers worldwide. The authors conclude that improvements are required for the collection of acute pesticide poisoning data in less developed countries and in the verification of the circumstances of poisonings and their relative severity. There is the need to move away from further attempts to estimate global data and concentration instead on obtaining reliable data from realistic crop protection activities.

Author: Litchfield, Melville H.
Full Source: Toxicological Reviews 2005, 24(4), 271-278 (Eng)

Neuropsychological correlates of hair arsenic, manganese, and cadmium levels in school-age children residing near a hazardous waste site
2006-06-08
In this study, the potential associations between hair metal levels and the neuropsychological function and behaviour of school aged children was explored. Thirty-two children, 11-13 years old, were administered a variety of tests that assessed general intelligence, visual-motor skills, receptive
Parents and teachers rated the children’s attention, executive functions, and behavior problems.

In Bangladesh, millions of people are suffering from arsenic toxicity due to the contamination of high concentration of naturally occurring arsenic in the drinking water. This study evaluated the biochemical changes in chronic arsenic exposure in 115 exposed subjects diagnosed as arsenicosis patients and 120 unexposed volunteers. Each patient was examined and interviewed. Drinking water, urine and peripheral blood samples were collected from all participants and analyzed. The results demonstrated an average level of arsenic in the drinking water and spot urine samples of the arsenicosis patients of 218.1 μg/L and 234.6μg/L in the control subjects. The duration of exposure was 7.6(5.2 yrs that ranged from 1-25 yrs. Prevalence of diabetes mellitus among chronic arsenicexposed subjects was about 2.8 times higher than the unexposed subjects. The activities of alkaline phosphatase were significantly elevated in the patients, 197 U/L compared to 149 U/L in the controls, but alanine transaminase and aspartate transaminase were mostly normal. The patients had significantly lower levels of serum creatinine; but had significantly elevated levels of total protein. The mean level of inorganic phosphate in the serum of arsenicosis patients was significantly higher in arsenicosis patients, indicating substitution of the pentavalent arsenate for the phosphate ion causing underutilization of the latter. Evaluation of the lipid profiles showed while the levels of triacylglycerol were not much different, the patients had significantly lower levels of cholesterol, HDL-cholesterol and LDL-cholesterol compared to the unexposed subjects. The authors conclude that these findings suggest significant changes in biochemical parameters in human arsenic toxicity.

Authors: Nabi, A. H. M. Nurun; Rahman, M. Mahfuzur; Islam, Laila N.
Taiwan was heavily contaminated by dioxins, impurities formed in the PCP production process. This literature investigated the influence of contaminated fish consumption of high average daily intake of PCDD/Fs. The average serum PCDD/Fs of residents living nearby area was found to be (62.5 pg WHO-TEQ/g lipid), this was higher than those living in the non-polluted area (22.5 and 18.2 pg WHO-TEQ/g lipid). In biota samples, average PCDD/F of milkfish in sea reservoir (28.3 pg WHO-TEQ/g) was higher than those in the nearby fish farm (0.15 pg WHO-TEQ/g), and Tilapia and shrimp showed the similar trend. The average daily PCDD/Fs intake of 38% participants was higher than 4 pg WHO-TEQ/kg/day suggested by the world health organization. Serum PCDD/F was positively associated with average daily intake (ADI) after adjustment for age, sex, BMI, and smoking status. The authors concluded that a prospective cohort study is suggested to determine the long-term health effects on the people living near factory. Inhabitants living near a deserted PCP factory are exposed to high PCDD/F levels.

Authors: Lee, C. C.; Lin, W. T.; Liao, P. C.; Su, H. J.; Chen, H. L. Full Source: Environmental Pollution (Amsterdam, Netherlands) 2006, 141(2), 381-386 (Eng)