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Paraquat intoxication and hemocarboperfusion

In this study, 31 patients, admitted at an institution from April 1997 to June 2004, with suspected paraquat intoxication were examined. Thirty cases had suicidal intention and all had ingested the toxic compounds by mouth. Treatment consisted of skin and digestive decontamination with gastric washing and activated charcoal or Fuller’s Earth. The first medical care was performed after 1 h 14 min. By laboratory measurement and/or clinical observation it was possible to confirm the gastrointestinal absorption of paraquat for 24 patients (17 males - 7 females: 49 (17 years). The estimated ingested volume was higher for 15 nonsurvivors relative to 9 survivors. Initial serum paraquat of 7 nonsurvivors was also higher than the serum level of 6 survivors. All patients with serum paraquat >1.7 mL/L did not survive. The paraquat urine level, simultaneous to the first serum detection, was higher for 6 survivors compared with 4 nonsurvivor patients. Hemoperfusion with activated charcoal was performed after December 1997 until June 2004 for 25 patients. Twenty of the 24 patients confirmed for paraquat intoxication were treated with this technique (12/15 of the nonsurvivors and 8/9 of the survivors). Total no. of sessions was identical, total time of hemoperfusion was higher but the beginning of the first session was later for the survivors. Clinical signs and laboratory analysis were collected at admission trying to detect markers of prognostic survival value. Hypernatremia, hypokaliemia, hyperglycemia, and acute renal failure were more frequent for nonsurvivors but the variable timing of the first laboratory detection jeopardizes the analysis, perhaps excluding acute renal failure. Rapid evolution to shock led to death for 7 patients at the first day of admission and to another 4 deaths the next day. Median survival of nonsurvivors was 1.2 days. Evolution to pulmonary fibrosis for the 9 survivors was not investigated. The authors concluded that paraquat intoxication was highly lethal, leading to a 63% mortality rate of the patients. Hemoperfusion did not reveal any survival advantage for the patients.

Authors: Castro, Rui; Prata, Catarina; Oliveira, Luis; Carvalho, Maria Joao; Santos, Josefin; Carvalho, Felix; Morgado, Teresa

Full Source: Acta Medica Portuguesa [computer optical disk] 2005, 18(6), 423-432 (Port)

Genetic polymorphisms in CYP1A1 and GSTM1 predispose humans to PCBs/PCDFs-induced skin lesions

Polychlorinated biphenyls (PCBs) and dibenzo furans (PCDFs) are ubiquitous persistent pollutants in humans. It is unknown whether people with different genotypes have different susceptibility to these chemicals. This study evaluated a group of people highly exposed to PCBs/PCDFs, to test this hypothesis that genotypic polymorphisms affected susceptibility for development of skin manifestations. In 1979, approximately 2000 people in central Taiwan ingested cooking oil contaminated with PCBs/PCDFs. Skin disorder such as chloracne, abnormal nail, hyperkeratosis and skin allergy were found in PCBs/PCDFs exposed group. These subjects were recruited for blood testing and a telephone-interview. Single nucleotide polymorphisms, AhR Arg554Lys, CYP1A1 Ile462Val, CYP1A1 T6235C, and GSTM1/T1 deletion, were detected. Occurrence of skin manifestations was compared among people with different genotypes while stratified by PCB exposure levels by logistic regression. The results showed that skin manifestations including chloracne, allergy, abnormal nail, and hyperkeratosis were more prevalent in exposed people in a dose related manner. Among highly exposed individuals, combined CYP1A1-MspI mutant genotype and GSTM1-
null genotype were associated with increased risk of chloracne. Among intermediately exposed individuals, GSTM1 null genotype was associated with skin allergy. AhR Arg554Lys genotype and GSTT1 null genotype were not related to susceptibility to skin manifestations in PCB/PCDF-exposed population. The authors concluded that CYP1A1 and GSTM1 genotypic polymorphisms might be related to the susceptibility to PCB/PCDF-induced skin manifestations.

Authors: Tsai, Pei Chien; Huang, Wenya; Lee, Yeu-Chin; Chan, Shih Huang; Guo, Yueliang Leon
Full Source: Chemosphere 2006, 63(8), 1410-1418 (Eng)

The incorporation of lipid emulsions in parenteral diets is a requirement for energy and essential fatty acid supply to critically ill patients. In this study, 10 healthy volunteers were recruited, and blood samples were collected before infusion of a soybean oil emulsion. Eleven volunteers were studied immediately after isolation and again after 4 h or 48 h in culture. The following detections were made: compn. and concn. of fatty acids in plasma, lymphocytes and neutrophils, lymphocyte proliferation, levels of cell viability, DNA fragmentation, phosphatidylserine externalization, mitochondrial depolarization, reactive oxygen species production, and neutral lipid accumulation. The results demonstrated that soybean oil emulsion decreased lymphocyte proliferation, reduced lymphocyte and neutrophil apoptosis, and provoked neutrophil and lymphocyte apoptosis and necrosis. Evidence was obtained showing that soybean oil emulsion decreased lymphocyte proliferation, reduced lymphocyte and neutrophil apoptosis, and provoked neutrophil and lymphocyte apoptosis and necrosis. The authors concluded that soybean oil emulsion given as a single dose of 500 mL promotes lymphocyte and neutrophil death that may enhance the susceptibility of the patients to infections.

Authors: Cury-Boaventura, Maria Fernanda; Gorjao, Renata; Martins de Lima, Thais; Piva, Tatiane Maria; Peres, Carmen Maldonado; Soriano, Francisco Garcia; Curi, Rui

Transduction of Tumor Necrosis Factor-Related Apoptosis-Inducing Ligand into Hematopoietic Cells Leads to Inhibition of Syngeneic Tumor Growth in vivo

Tumor necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL) is a member of the TNF family of cytokines and has been shown to induce cell death in many types of tumor and transformed cells but not in normal cells. This tumor-selective property has made TRAIL a promising candidate for the development of cancer therapy. However, studies on tumor selectivity of exogenous TRAIL protein were carried out in xenograft models, which do not directly address the tumor selectivity of endogenous TRAIL protein. In this study, TRAIL protein was overexpressed in hematopoietic cells and the effects on tumor growth were investigated. The results demonstrated that TRAIL protein overexpression in hematopoietic cells inhibited the growth of syngeneic tumors in vivo. The authors concluded that TRAIL protein overexpression in hematopoietic cells may be a new strategy for the treatment of cancer.

Authors: Tsai, Pei Chien; Huang, Wenya; Lee, Yeu-Chin; Chan, Shih Huang; Guo, Yueliang Leon
Full Source: Chemosphere 2006, 63(8), 1410-1418 (Eng)
TRAIL in a syngeneic system could induce tumor cell death while leaving normal tissue cells unharmed. In this study, mice that overexpress TRAIL by retroviral-mediated gene transfer in bone marrow cells followed by bone marrow transplantation were established. The results showed that TRAIL overexpression is not toxic to normal tissues, as analyzed by hematological and histological analyses of tissue samples from TRAIL-transduced mice. The authors concluded that the results demonstrated TRAIL overexpression in hematopoietic cells leads to significant inhibition of syngeneic tumor growth in certain tumor lines. This approach may be used further to identify important molecules that regulate the sensitivity of tumor cells to TRAIL-induced cell death in vivo.

Author: Song Keli; Benhaga, Nordine; Anderson, Robin L.; Khosravi-Far, Roya
Full Source: Cancer Research 2006, 66(12), 6304-6311 (Eng)

**Analysis of Heavy Metals in Scalp Hair Samples of Hypertensive Patients by Conventional and Microwave Digestion Methods**

This study assessed the heavy metals (cadmium, copper, iron, nickel, chromium, lead, and zinc) in scalp hair samples of 200 hypertensive (HT) patients of an urban population together with 215 non-hypertensive male subjects in the age group of 30-60 years. Hair samples were digested with conventional wet ashing and microwave digestion. Analyses of both digests were done by flame and graphite furnace atomic absorption spectrometry. According to a statistical evaluation of the results, the microwave digestion method was a valid alternative to the conventional acid digestion method, but it gave a faster digestion. The overall metal recoveries were 96-98% of those obtained with microwave digestion. Among the toxic elements detected, levels of Ni, Cd, Cu, Cr, and Pb in scalp hair samples of hypertensive patients were significantly higher compared normal male subjects, whereas the essential elements such as iron and zinc were found to be low compared age-matched non-hypertensive subjects.

Authors: Afridi, Hassan Imran; Kazi, Tasneem Gul; Jamali, Mohammad Khan; Kazi, Gul Hasan; Arain, Mohammad Bilal; Jalbani, Nusrat; Shar, Ghulam Qadir
Full Source: Spectroscopy Letters 2006, 39(2), 203-214 (Eng)

**Thin layer headspace gas chromatography for biological monitoring of persons exposed to volatile organohalogen compounds from water**

Thin layer headspace (TLHS) technique with autogenous generation of liquid sorbent was evaluated in terms of its applicability to the detection of volatile organohalogen compounds (mainly trihalomethanes - THMs) in human urine and blood. In this technique, volatile analytes are stripped at elevated temperatures from a thin film of a liquid sample flowing continuously on the walls of a so-called TLHS column driven by a stream of purified gas. In the process, the gas becomes saturated with water vapor. The gas is then directed to the second, smaller TLHS column kept at subambient temperature. The water absorbed in the gas condenses inside the column, and volatile analytes partition to the condensate according to their Henry’s law constants. This results in the analyte isolation from the complex matrix and their preconcn. The aqueous extract (condensate) is analyzed by direct
injection onto a thick-film non-polar gas chromatography column and electron capture detection. Basic characteristics of the method have been detected. The calibration plots were linear in the concentration range examined. The authors concluded that the precision of the method was good, with RSD less than 22% for all analytes. The limits of detection were below 0.02 µg L-1 for all analytes. The concentration factors did not differ significantly for water and urine samples, indicating little or no matrix effects. The method has been applied to the detection of THM levels in urine and blood in a group of volunteers. The findings confirmed that these fluids can be used to monitor the exposure of individuals to THMs.

Authors: Polkowska, Zaneta; Kozlowska, Katarzyna; Koniczka, Piotr; Jakubowska, Natalia; Gorecki, Tadeusz; Namiesnik, Jacek

Full Source: Chemia Analityczna (Warsaw, Poland) 2006, 51(1), 109-122 (Eng)