1218 SALIVARY OXIDATIVE STRESS BIOMARKER: 8-HYDROXYGUANOSINE

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Introduction Oxidative stress leads to many kinds of diseases. Various chemicals in workplaces induce oxidative stress. In addition, psychological stress also increases oxidative stress. To prevent diseases potentiated by oxidative stress, a method for the appropriate assessment of the oxidative stress status is needed. Currently, urinary 8-hydroxydeoxyguanosine (8-OHdG) is widely measured as an oxidative stress biomarker. There is a specific advantage if saliva can be used as the sample to measure the oxidative stress biomarker, because saliva is much easier to collect than urine. However, the accurate measurement of 8-OHdG in saliva is impractical, because the quantity of 8-OHdG in saliva is quite low. In this study, we investigated the measurement of 8-hydroxyguanine (8-OHGua) in saliva, as an oxidative stress marker.
Methods The 8-OHGua levels in saliva were analysed by a column switching HPLC system equipped with an electrochemical detector (HPLC-ECD).
Results The 8-OHGua in saliva could be detected as a single peak by HPLC-ECD. The salivary 8-OHGua levels of smokers were significantly higher than those of non-smokers.
Conclusion Salivary 8-OHGua may be a useful biomarker in the human population, in relation to the assessment of the oxidative stress induced by various factors in working environments.

1424 OCCUPATIONAL TOLUENE DIISOCYANATES EXPOSURE AND CANCER MORTALITY: 12-YEAR FOLLOW-UP STUDY FOR TEN THOUSAND MALE WORKERS IN KOREA

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Introduction An International Agency for Research on Cancer (IARC) evaluated that the TDI was possibly carcinogenic to humans (Group 2B) based on inadequate evidence in humans and sufficient evidence in experimental animals. However after the IARC review, some epidemiologic study suggested that TDI was related to the cancer occurrence, especially lung cancer. So we analysed the cancer mortality of methanol exposed male workers in Korea.
Methods A cohort was comprised of 10,526 TDI exposed workers working between January 1, 2000, and December 31, 2004. These cohort members were matched with the mortality data of the Korean National Statistical Office to follow-up for cancer mortality between 2000 and 2011. Standardised Mortality Ratios (SMRs) of methanol exposed workers with reference to Korean men were calculated. Also controlling age, calendar year and other carcinogen exposure including hepatitis B and C, the Adjusted Hazard Ratios (AHRs) of workers categorised by the TDI-exposure duration (over 10 years) with reference to workers with less than 10 years were calculated.
Result There were no significantly increased or decreased SMRs. But, non-significantly increased SMRs were observed in lung cancer (SMR=1.11, 95% CI: 0.41 to 2.41) with over 10 years exposure. There were no significantly increased or decreased AHRs of cancer mortalities in workers exposed to TDI with over 10 years exposure compared to workers with less than 10 years.
Discussion In this study short follow-up periods and healthy worker effect (HWE) may hamper observation for increasing cancer mortality of TDI exposed workers comparing to that of Korean male. Continuous follow-up to overcome HWE and cancer morbidity study are needed to confirm this study result.

447 TISSUE DISTRIBUTION OF INDIUM AFTER AN INTRATRACHEAL OR A SUBCUTANEOUS ADMINISTRATION OF INDIUM OXIDE IN RATS

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Introduction Indium oxide (In_2O_3), a raw material from which indium tin oxide (ITO) is produced, causes indium lung disease, and there is a possibility of inhalation exposure during the manufacturing of ITO. It is, however, not known whether indium is more widely distributed throughout the body after In_2O_3 exposure. The aim of this study was to clarify the tissue distribution of indium in rats after intratracheal instillation or subcutaneous injection of In_2O_3.
Methods Male rats were divided into three groups: an In_2O_3 intratracheal group (n=25), an In_2O_3 subcutaneous group (n=25), and a control group (n=30). In both In_2O_3 groups, rats received a single 10 mg In/kg body weight dose of In_2O_3. A subset of rats was periodically euthanized throughout the study from 1 day to 36 weeks after treatment. Indium concentrations in the organs were determined using inductively coupled plasma–mass spectrometry.
Results In both In_2O_3 groups, very low concentrations of indium were detected in the main organs on day 1 after treatment. Although the content of indium in the lungs for the subcutaneous group gradually increased over the 36 week observation periods, that for the intratracheal group deceased slowly with clearance half-life of approximately 22 weeks. In both In_2O_3 groups, the indium concentration in each intraperitoneal organ gradually increased over time until 36 weeks, with levels being higher in the subcutaneous group than in the intratracheal group at 36 weeks.
Discussion Although the indium accumulation ratio in each intraperitoneal organ for the total administration doses was very low, indium accumulation in these organs indicated that translocation from the lungs or subcutaneous tissue occurred. This study clarifies that when In_2O_3 is administered intratracheally or subcutaneously in rats, indium becomes widely distributed in the body and is excreted very slowly.

1213 PLASMATIC MICRORNAS PROFILE EXPRESSION IN MALIGNANT PLEURAL MESOTHELIOMA

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Introduction Malignant Pleural Mesothelioma (MPM) is an aggressive cancer caused by occupational, environmental and indirect exposure to asbestos, material that some countries have already prohibited. Survival is less than 1 year. Diagnosis is currently a challenge and the search for early, single or combined diagnostic biomarkers continues to be performed on non-invasive samples. MicroRNAs are circulating released molecules whose expression is altered in some types of cancer, making them good diagnostic candidates in the MMP.
Methods A descriptive study was carried out in plasma of 6 cases of MPM and 6 controls without exposure to asbestos matched by age and sex. The samples come from a previous case-control study conducted in Mexico from 2011 to 2016. We evaluated 384 plasma microRNAs by means of RT-qPCR using the platform and QIAgen. The analysis of results was performed with the GeneGlobe program.

Results hsa-miR-1587, hsa-miR-19b-1–5 p, hsa-miR-93–3 p, hsa-miR-21–3 p, hsa-let-7i-3p, hsa-miR-194–5 p, hsa-miR-1280, hsa-miR-18a-3p, hsa-miR-133a-3p, hsa-miR-4286, hsa-miR-2467–3 p, had altered expression in cases and controls
Discussion While some microRNAs found in this study have been associated with kidney disease, hypertension, endometriosis, liver cancer, diabetes, colorectal cancer, gastric and esophageal cancer; The microRNA hsa-let-7i-3p associated with lung cancer are specially interest, miR-194–5 p deregulated in tumorogenesis and miR-1280 modulates cell growth, so the next step will be to validate them in a new collection of samples and perform the network of interaction in the metabolic pathways.

606 SEGMENTARY DEMYELINATING POLYNEUROPATHY AS A SEQUEL BY ARSINE GAS INTOXICATION. CASE REPORT

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Introduction Arsine gas intoxication generates enzymatic changes on glutathione in erythrocytes, leading to massive hemolysis, which manifests as altered consciousness, hematuria, jaundice, and renal failure. Its importance lies in the early diagnosis for the limitation of its sequelae.
Methods 26-year-old worker, operator in the area of polymetals, who in June 2016, after adding zinc in a mixing tank, starts with ocular ardour, upper respiratory tract irritation, nausea and vomiting. Initially treated as gastroenteritis, whithout response to treatment. Evaluated by internal medicine diagnosing hemolytic uremic syndrome and liver failure requiring hospitalisation. Presenting later short-term memory loss, vertigo, pain and weakness in pelvic limbs. Evaluated by neurology granting symptomatic management and requesting electromyography of pelvic limbs, which reported segmental demyelinating polyneuropathy. Valorated by the occupational health division, where a specific study was carried out observing the inconsistent use of personal protective equipment, as well as the inadequate manipulation of the zinc as causative factors of intoxication, determining neuropathy as a sequel.
Result Laboratory: arsenic: in urine 715.0 µg/L, in blood 95 µg/L; Hb 7.1 g/dl, Hct 28%, creatinine 3.2 mg/dl, urea 149 mg/dl, urinalysis: nitrites +, proteins 500 mg/dl, haematuria. Physical examination: paraesthesia and dysaesthesias of pelvic limbs, muscle strength 3/5 bilateral, electromyography of pelvic limbs: motor polyneuropathy of the type of segmental demyelination.
Discussion Exposure to arsine gas without adequate personal protective equipment can lead to severe intoxication, develop of sequelae and even death. In the present case the process by which arsine gas is produced in the workplace is compatible with the symptoms and sequelae presented by the worker, demonstrating the cause-effect work-injury relationship.

851 DEFINING THE CONTRIBUTION OF DIETARY SOURCES OF FURFURAL METABOLITES IN URINE: IMPLICATIONS FOR BIOMONITORING AND RISK ASSESSMENT

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Introduction Furfural is an organic compound derived from a variety of agricultural products, and it is mainly used as petrochemical solvent and in rubber industries. In a wide range of food heating processes furfural may rise from 5-hydroxymethylfurfural (5-HMF), a product of dehydration of sugars and Maillard reactions. Our aim is the development of analytical approach to determine the common urinary metabolism of furfural and 5-HMF, by quantification of 2- and 3- furoic acids (FA), 5-HMF itself and its specific metabolite, 5-hydroxymethyl-2-furoic acid (HMFA).
Methods A group of healthy control subjects received an oral dose of 5-HMF in plum juice (780 mg) and its relative metabolites the investigated in urine within 24 hours. Analysis were carried out by solid-phase microextraction and gas chromatography/mass spectrometry. FAs were determined in *head space* after the conversion into their methyl esters derivatives by a reaction with trimethyloxonium tetrafluoroborate. HMFA tert-butyldimethylsilyl derivative was detected by *direct immersion* using *N*-tert-butyldimethylsilyl-*N*-methyltrifluoroacetamide while 5-HMF quantification was perfomed by *on sample* derivatization with O-(2,3,4,5,6-pentafluorobenzyl) hydroxylamine.
Results Data from 22 subjects were analysed. Mean daily concentrations of 2-FA, 5-HMF were quantified 46.1±15.1 mg/24 hour, 7.53±2.11 mg/24 hour. HMFA and 3-FA were not detected in all urine samples. 2-FA and 5-HMF concentration resulted particularly higher within 6 hours after the plum juice administration (mean of 37.1 mg/L and 5.3 mg/L respectively).
Conclusion Total urinary FAs may not discriminate a food intake or environmental exposures. Significant increases of 2- and 3-FA concentrations from professional exposure are identified, while high values of 2-FA alone are found after the intake of food with elevated quantity of HMF. Therefore total FA as Biological Exposure Index by the American Conference of Governmental Industrial Hygienists, could lead to unsuitable assessment of the level of furfural in the workplace.