seasons was observed, with lower values in spring and higher in winter. Smoking increased the excretion of U-BENZ but not affected that of U-MTBE. The results of this study suggest that U-MTBE is a reliable marker for the assessment of exposure to urban traffic, while U-BENZ is influenced both from the moment of the day and smoking habit.

ANALYSES OF INFLAMMATION MARKERS IN EXHALED BREATH CONDENSATE IN SMOKERS AND NONSMOKERS BY LC-MS/MS

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Biological effect monitoring has become important for the detection of diseases of the respiratory system in early stages. In the last decade the use of exhaled breath condensate (EBC) increased rapidly because its sampling is non-invasive. Prostaglandines, leukotrienes and 3-nitrotyrosine (3-NT) were assumed to be markers of inflammation effects. In view of the accurate determination of the basal concentrations of these markers in EBC we developed some analytical procedures using LC-MS/MS and applied them on healthy smoking and non smoking subjects.
Exhaled breath condensate was collected using the ECOSCREEN sampling system. External and online solid phase extraction were performed for clean up and preconcentration. The analytes were determined by high performance liquid chromatography and tandem masss spectrometry using electron spray ionisation and selected reaction monitoring. The procedure was applied to EBC samples of 20 healthy smokers ond non smokers.
The validation of the new LC-MS/MS procedures resulted in data of high precision (2 – 8 %) and accuracy (91 – 115 %). The limits of quantitation were found to be between 5 and 10 pg/ml. In 94 % of the EBC samples 3-NT was found to be over the limit of quantitation whereas prostaglandines and leukotrienes were generally below the quantification limits. The values of 3-NT ranged between the determination limit and 184 pg/ml. 3-NT concentrations were not significantly different in EBC of smokers and non smokers. The values were distinctly lower than in studies with the application of immunochemical analytical technique (EIA) on EBC of healthy subjects.
These new procedures for determining prostaglandines, leukotrienes and 3-nitrotyrosine in exhaled breath condensate have proved accurate and reliable. Due to the fact that prostaglandine and leukotriene concentrations were below the detection limits in real EBC samples of healthy subjects, a further improvement of sensitivity is required.

PHENOL, CATECHOL AND HYDROQUINONE IN BLOOD AMONG WORKERS EXPOSED TO BENZENE

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[ID 1249]

Background: We have developed a reliable GC/MS method of determination of benzene metabolites(phenol,catechol and hydroquinone) in blood. However, blood metabolites as biomarkers of benzene exposure have not been validated.
Aim: To validate correlations between benzene exposure and metabolites in blood among workers.
Methods: After signing consent forms, 88workers provided blood samples for phenol(PH),catechol(CAT) and hydroquinone(HQ) measurements by GC/MS. One hundred and four workers provided urine samples and sPMA were measured using ELISA kits. Twenty non-exposed workers were recruited as controls. Area and personal samples were taken from each workplace for one week to calculate daily average ,weekly average and long-term average exposure levels. Blood levels of PH,CAT and HQ and urinary sPMA were compared between controls and workers. Correlations between blood metablotes,urinary sPMA and external exposure metrics were tested.
Results: Levels of free metabolites(PH,CAT and HQ) in blood significantly increased among benzene exposed workers,0.107ug/ml,0.022ug/ml,0.427ug/ml respectively. Both free and total(free+conjugated) metabolites in blood increased with the increases of exposure. When exposure increased, proportion of PH among total amount of three metabolites decreased. Free/conjugated ratios of PH and CAT other than HQ decreased when exposure increased. Urinary sPMA level increased significantly after workshift, 9.382 umol/mol Cr vs 87.329 umol/mol Cr. Urinary PMA was significantly associated with exposure metrics.
Conclusions: Metabolites(PH,CAT and HQ) in blood might be biomarkers of benzene exposure. This study also confirmed that urinary sPMA is sensitive biomarker of benzene exposure.

BIOLOGICAL MONITORING OF LOW EXPOSURE TO POLYCYCLIC AROMATIC HYDROCARBONS

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Aim of the work was the assessment of low exposure to polycyclic aromatic hydrocarbons (PAHs) by biological monitoring. Italian asphalt workers (AW, n=100) and roadside construction workers (CW, n=47) were investigated by measurement of hydroxylated metabolites and unmetabolized PAHs in urine spot samples collected respectively after two days of vacation (baseline), before and at the end of the monitored workshift, in the second part of the workweek. Biomarkers were determined by HPLC-fluorimetry and GC-MS.
Median airborne levels during the workshift of 15 PAHs (both vapour and particulate phases), from naphthalene to indeno(1,2,3-cd)pyrene, ranged from below 0.03 to 426 ng/m3. Median excretion values of 1-hydroxypyrene (OH-Py) in baseline, before- and end-shift samples were 1.04, 1.84 and 3.16 nmol/L for AW and 1.19, 1.39 and 1.73 nmol/L for CW; lower values were found in non-smokers compared to smokers. In all subjects a weak correlation between personal exposure to the sum of airborne 15 PAHs and OH-Py was observed. Urinary naphthalene, phenanthrene, pyrene and fluorene were detected in the majority of the samples in the range below 0.01 to 2.54 nmol/L. Significant differences in the levels of the unmetabolized compounds were found between AW and CW. Moreover in AW samples the urinary excretion of most analytes increased during the work shift. The results of this study show that AW experienced a moderate occupational exposure to airborne PAHs, resulting in a significant increase of urinary biomarkers during the workday and the workweek. Both hydroxylated metabolites and unmetabolized PAHs in urine may be suggested as biomarkers of low exposure to PAHs.

A RE-APPRAISAL ON CLINICAL MANAGEMENT OF ACUTE METHANOL POISONING

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Objective: To elucidate the re-cognition on diagnosis and treatment of methanol toxicosis after summarized data of 42 poisoning cases. Methods: The data of 42 cases with methanol poison that occurred in Guangzhou, P. R. China in May 11, 2004 was summarized. The methanol concentration in wine was detected by Guangzhou Quality Supervise Control Bureau. The epidemiological information was investigated by municipal and district CDCs (Central Disease Control). The methanol concentration of blood was measured with gas chromatogram in Occupational & Environmental Hygiene Monitor Center in our hospital. The diagnosis was according to the National Occupational hygiene Criterion (GBZ53-2002) and was consisted of three stages, including observation, slight, and severe poison. The patients were cured with general therapies. Results: The methanol concentration in wine was 16% - 46%. The average age of patients (40 men and 2 women) was 46.1 year (22 – 80 year). The average consumption of the wine was 588.1ml (50 -2000 ml) per patient. The average methanol concentration in blood was 1.61 mmol/L (0.03 – 23.60 mmol/L). Among them, 17 observation cases, 9 slight toxicosis, and 16 severe toxicosis, 35 patients were cured (83.3%), 2 with blind (4.8%), 4 with neuropsychotic sequelae (9.5%). And, one was death (2.4%). Conclusion: Success of this salvage was based on the recognition of local government, the counterplan for emergency of public health events, special therapies in poison control center (PCC), and cooperation of departments and specialist groups.