Results Mean overall serum dioxin level was: 31.4 pg CALUX TEQ/g fat (mean values for the general Flemish population: 35.0–41.8 pg). Maintenance workers had significantly ($p < 0.05$) lower serum dioxin levels (mean 26.9 pg) than garage workers (38.3 pg) and administrative workers (38.8 pg). Maintenance workers with >10 years seniority had lower serum dioxin levels (24.7 pg) than those with ≤10 years seniority (31.5 pg). This difference was not significant. No higher serum dioxin concentrations were found in smokers, high BMI, living near a road with heavy traffic.

Conclusion The results showed no increased dioxin-like serum levels in maintenance workers in the two municipal waste incinerators. These results seem to indicate that there is no additional risk for dioxin exposure in the two considered waste incinerators.

357 OCCUPATIONAL EXPOSURE TO SELENIUM COMPOUNDS, ITS EFFECT ON BIOLOGICAL PARAMETERS AND MARKERS OF DIABETES

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Introduction Selenium (Se) exhibits a very small safety margin between recommended daily intake and harmful dosages (e.g. elevated risk for diabetes). Volunteer exposure studies have indicated different metabolisms for organic and inorganic Se compounds. The objective of this study was to establish a comprehensive biological monitoring approach for elemental/inorganic Se exposure at workplaces and to evaluate its potential effects in men.

Methods In a case-control study we determined total Se in plasma and urine, Se speciation in urine, Glutathione peroxidase activity, prothrombin time, glucose, HbA1c and proinsulin in 18 employees of a Se processing plant and 18 age matched controls without occupational Se exposure. For the Se-exposed group we additionally measured the average shift level of total Se and of water-soluble Se-fraction in air, Se in urine at the beginning and at the end of the shift, and after at least two weeks off-work.

Results Se plasma levels of the exposed individuals ranged between 62 and 123 µg/L and urine levels after shift ranged between 22 and 340 µg/g creatinine. Both were significantly higher than the levels in the controls. The air exposure to total Se ranged between <LOD and 2394 µg/m³. For glutathione peroxidase activity, prothrombin time, glucose, HbA1c and proinsulin there were no significant differences between the two groups.

Conclusion At workplaces in the selenium processing industry considerably high air concentrations of Se were detected, which exceeded the German exposure limit (MAK 20 µg/m³). In contrast, the biological tolerance limit (BAT 150 µg Se/L plasma) was not exceeded. These diverging results necessitate a differentiated look on Se at workplaces. The workplace conditions including the kind of selenium (elemental, inorganic, water-soluble, organic) should be considered. A revision of selenium threshold values seems advisable.

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URINARY BLADDER CANCER IN A FORMER AREA OF COAL, IRON AND STEEL INDUSTRIES IN GERMANY

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Introduction Urinary bladder cancer risk in coal miners is currently under debate. We report on a recently performed study in 2 departments of urology in Dortmund, a centre of the former underground hard coal mining industry in Germany. In the greater Dortmund area in the 1990s when coal, iron and steel industries were still active, 70% of bladder cancer cases were glutathione S-transferase M1 (GSTM1) negative, compared to 54% in unexposed controls.

Methods A total of 400 bladder cancer cases and 442 controls with benign urological diseases but without a history of malignancies, were assessed by questionnaire from July 2009 to July 2013. Furthermore, all patients were genotyped for polymorphic enzymes relevant for bladder cancer like glutathione S-transferase M1 (GSTM1) and N-acetyltransferase 2 (NAT2).

Results More than ten years after closure of these industries, the frequency of the GSTM1 negative genotype decreased to 52%, which is a normal finding in general population (OR 0.96, 95% CI: 0.73 to 1.26; smokers: OR 0.93, 95% CI: 0.66 to 1.30; non-smokers: OR 1.02, 95% CI: 0.58 to 1.80). However, former hard coal miners had still an elevated bladder cancer risk (hospital A: 20 bladder cancer cases (10%) and 8 controls (3%) (OR 3.22, 95% CI: 1.39 to 7.49); hospital B: 32 cases (16%) and 20 controls (10%) (OR 1.72, 95% CI: 0.95 to 3.12). The slow N-acetyltransferase 2 status, which is associated with an increased bladder cancer risk in persons formerly exposed to aromatic amines, was normal in hard coal miners with bladder cancer in all three studies in the Dortmund area.

Conclusion After closure of the coal, iron and industries in the 1990s, GSTM1 negative genotype is currently no more a relevant bladder cancer risk factor. However, an elevated bladder cancer risk in former hard coal miners is still observable.

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PROGNOSIS OF OCCUPATIONAL BLADDER CANCER AND POLYMORPHIC XENOBIOTIC METABOLISING ENZYMES

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Introduction In recent years, approximately 150 bladder cancer patients per year were acknowledged as an occupational disease in Germany. The question rises whether in genome-wide association studies described bladder risk factors may modulate the prognosis of occupational bladder cancer.