

## Abstract

### Evaluation of correction method of urinary marker for biological monitoring of n-hexane, trichloroethylene and mercury

**Objectives:** The objective of this study was to evaluate the effect of correction methods of urinary biomarkers on airborne hazards among the workers exposed to n-hexane, trichloroethylene and mercury.

**Methods:** In this research, we carried out the field survey through measurement of airborne hexane, trichloroethylene and mercury with sampling of urinary 2,5-hexandione, trichloroacetic acid, and mercury. In case of mercury and hexane, the national data of urinary biological monitoring from the database of workers specialized exam and airborne mercury and hexane from the database of regular workplace measurement respectively. After enrolled of 245 samples, the subgroup analysis was conducted by the category of three variance of biological monitoring ; first, the variance of timing of urinary sampling with airborne measurement, secondly, the variance of difference of exposed level at airborne measurement, finally, the variance of urinary clearance from the difference of lifestyle habit such as smoking, alcohol-drinking and mercury-rich food intake. The statistically analysis was performed by spearman correlation and linear regression between airborne hazards and urinary biomarkers.

**Results:** The result of fields survey is following as;

1. The most strong correlation between of urinary mercury and airborne mercury was founded in the cases of urinary samples corrected by urinary creatinine.
2. The most strong correlation between of urinary 2,5-hexandione and airborne hexane was founded in the cases of urinary samples without correction by urinary creatinine among exposure groups.

3. The most strong correlation between of urinary trichloroacetic acid and airborne trichloroethylene was founded in the cases of urinary samples without correction by urinary creatinine in total cases.

The literature review and previous fields survey have been suggested similar results with this fields survey.

**Conclusion:** the conclusion is that the correction by urinary creatinine would be not recommended for analysis in cases of urinary 2,5-hexandione and trichloroacetic acid but in case of urinary mercury.

**Keywords:** Mercury, n-hexane, trichloroethylene, creatinine, specific gravity, urinary 2,5-hexanedione, urinary trichloroacetic acid, urinary mercury, biological monitoring, ambient monitoring