The study of exposure assessment using biomarkers collected from children living in an industrial complex area in Korea

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Background and Aims: Ulsan is one of the industrial cities where a big petrochemical complex is located. Since 2003, the study named "A Prospective Cohort Study of Environmental Pollutants: A study in an industrial complex area" has been conducted to investigate health effects associated with chronic exposure to environmental pollutants in Ulsan. Children are particularly vulnerable to adverse health effects associated with heavy metal exposure(Gunnar et al 2007). So one of the goals of the research was to investigate an association between biomarkers collected from children and area where they live.

Methods: The study participants were children aged 7-13 who lived in Ulsan. Informed consent was obtained from each participant. A questionnaire survey was conducted and bio-samples such as blood and urine were collected. A total of 734 participants had been recruited for two years(2009-2010). Area was divided into 3 groups depending on their proximity to the industrial complex. Data was analyzed using logistic regression analyses.

Results: The mean levels of blood lead and cadmium in the urine were 1.67㎍/ℓ and 0.72㎍/g creatinine, respectively. We observed a significant decrease in cadmium levels with increasing age. The lead levels in children living in study areas were lower than those in children living in comparison area but the difference was not statistically significant. On the other hand, the cadmium levels in children living in study areas were significantly higher than those in children living in comparison area after adjusting for age, income, sex, the use of odorant at home.

Conclusions: Our observation supports the hypothesis that environmental exposure levels of children are correlated with their environmental quality where they live.

References:

Gunnar N, Bruce F, Monica N, Lars F. Handbook of the toxicology of metals 3rd edit. Academic Press 2007;119.