

Urine Phenol Level Among Healthy Subjects In Urban Area

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Citation

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Abstract

Phenol is of particular concern because recent research indicating that phenol exposure can result in chronic toxicity. Phenol can be found at high levels in the traffic area, therefore, people living in the urban area of big city are highly exposed to traffic phenol vapor. However, there is limited information on using this biomarker for the general population in the urban area. In this work, the author studied the urine phenol level among a sample of healthy subjects in urban area of Bangkok. . The average (mean \pm SD) phenol concentration among these subjects was 7.4 ± 2.2 mg/g of urine creatinine.

INTRODUCTION

Phenol is of particular concern because recent research indicating that phenol exposure can result in chronic toxicity [1]. While no direct human evidence is available, there is recent evidence of carcinogenicity of phenol at high concentrations in experimental animals [2]. At present, work with phenol is subject to the Control of Substances Hazardous to Health (COSHH) Regulations. Apart from the industrial workers, there are other occupations with high risk for phenol exposure. Policemen is another occupation at risk for phenol exposure.

Phenol can be found at high level in the traffic area, therefore, people living in the urban area of big city are highly exposed to traffic phenol vapor [3,4]. For monitoring of phenol exposure, peripheral biomarker can be used. Urine phenol level is the standard biomarker for phenol exposure. This biomarker is widely used for the industrial workers. However, there is limited information on using this biomarker for the general population in the urban area. In this work, the author studied the urine phenol level among a sample of healthy subjects in urban area of Bangkok

MATERIALS AND METHODS

SUBJECTS

Thirty healthy volunteer males were included in this study. These students were living in the same area, Phayathai District but in the place about 0.5 kilometers away from roads. All subjects in this study presented the same eating and drinking habit. All subjects were healthy adults. Before the study, all were interviewed for possible exposure to other

sources of non - traffic vapors, especially for smoking and volatile substance. The exclusion was set in case with history of possible exposure to those vapors.

Each subject provided a urine sample for laboratory analysis. Concerning the laboratory analysis for urine phenol, the standard colorimetric method was used [5].

The statistical analysis of the results was carried by SPSS 7.0 Mean and standard deviation of urine phenol level among these subjects were calculated.

RESULTS

A total of 30 healthy subjects (all males) were included into this study. The average (mean \pm SD) phenol concentration among these subjects was 7.4 ± 2.2 mg/g of urine creatinine.

DISCUSSION

Phenols are among the highest-volume chemicals in production [3]. International organizations such as Agency for Toxic Substances and Disease Registry (ATSDR) [1] have documented phenol toxicity and recommend the monitoring of phenol exposure for groups at risk. The toxicity includes CNS depression and other symptoms such as skin burns, nausea, profuse sweating [1].

In exposure- and risk- evaluation, the monitoring of phenol by peripheral biomarker has several advantages over technical assessment of exposure. The urine methyl hippuric level is an acceptable peripheral biomarker for phenol exposure [1]. It was concluded that the phenol can be used for crude phenol exposure categorizations.

Phenol is an important contamination in traffic fume [3]. High phenol exposure among the population living in the urban area of big city can be expected. Here, the author studied the urine phenol level among healthy subjects in urban area in Bangkok. We recommend that annual check up and monitoring for phenol exposure among the people living in the area with traffic jam should be set as primary prevention of occupational – related toxicity for them.

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