Microsomal epoxide hydrolase-1 exon 4 polymorphism and H2S-exposure interaction on the spirometry parameters; interaction of gene-environment

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Background and Aims: Exposures to workplace pollutants such as H2S, can Induce respiratory symptoms in individuals exposed in the workplace. Inter-individual variation in human responses to air pollutants may be influenced by genetic variability in the xenobiotic metabolizing enzymes (1).

Methods: In this study 120 subjects exposed to H2S (sour gas refinery; SoGR) and 110 controls (sweet gas refinery; SwGR) were recruited. Pulmonary function test was performed using spirometer and the FVC, PEF, FEV1, FEV percent of predicted parameters were obtained. His139Arg (A>G) polymorphism in the exon 4 of microsomal epoxide hydrolase gene (mEPXH1) was determined using PCR-RFLP. The interaction of EPXH1 exon4 genotype and H2S exposure analysed using Two way ANOVA.

Results: Forced Vital Capacity (FVC) and peak expiratory flow (PEF) spirometric parameters were significantly higher in the H2S exposed subjects (SoGR subjects) in comparison with SwGR subjects. The FEV1 percent of predicted values were significantly higher in the SoGR subjects. There was no significant interaction between the Forced expiratory volume in one second (FEV1) and exposure to H2S. There was not significant difference between any spirometric parameters in the subjects with mEPXH AA and AG/GG genotypes.

Conclusions: The effects of occupational exposure to H2S on the pulmonary function tests were investigated. But there was no significant association between MEPXH1 polymorphism and spirometric parameters.

Keywords: Genetic polymorphism; Microsomal epoxide hydrolase 4; Occupational toxicology; Respiratory toxicology