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SUMMARY

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This investigation on genotoxicity in FFSA's is one of the necessary evaluations that has been done as a comprehensive approach to the biomonitoring of a population exposed to BZ along with TOL and XYL in occupational settings. This study has been attempted to ensure environmental quality and occupational health since worker's education about genetic damage is poor and risk for diseases is increasing enormously. The results of this study help us to draw few conclusions.

Statistically significant differences in genotoxicity end points were observed between the groups as measured by comet assay, MNT and CA analysis. Detection of clear differences in the exposure levels to BTX in fuel was observed between FFSA's and controls. Other factors like gender, age, smoking, alcohol consumption, air and blood BTX levels were identified as having significant impact on the results. Sufficient sample size and sensitivity of the statistical analysis while calculating the effect of these influential factors strengthens the results obtained on associated health risk. Environmental exposure assessment reveals that induced damage could be predominantly due to BZ with a substantial effect of the others (TOL; XYL).

Steps have been taken globally to limit and/or eliminate exposure to BZ both occupationally and environmentally. Looking back at the chronology of TLV for BZ, it has decreased from 100 ppm in 1946 to the current value of 0.5 ppm in around 50 years. The ACGIH seriously considered adopting 0.1-0.3 ppm, but finally settled on 0.5 ppm

TWA-TLV in 1998, because the relationship between low level exposure to BZ and the probability of developing leukemia is still uncertain.

This study demonstrates the feasibility of an integrated risk assessment approach. The biomarkers used in this study constitute to be the most satisfactory with regard to the low level - long term exposure to BZ occurring at contemporary work sites like fuel filling stations. We suggest the implementation of statutory requirements, pre-employment and periodic medical examinations to be performed as a good occupational health practice for workers in industrial undertakings for prevention of any occupation associated adverse health effects. Extensive studies and standardized tests to evaluate biological damage at different levels are recommended to public agencies concerned with environmental quality and public health. Annual check up and monitoring of /for environmental genotoxin exposure among people in urban areas, if set as a primary preventive step would lessen the number of hydrocarbon related deleterious effects. Health education to individuals and concern on hazard of BTX in big cities is also necessary. Although it may be impractical for workers to be constantly monitored for chemical exposure, it would be possible for workers to wear safety and protective equipment.

The present results also demonstrate the need and importance of an effective tri-lateral co-operation between the health services, employer and employee in order to reduce the risk of exposure and its health effects. In certain activities where BZ cannot yet be replaced and workers have to handle it, a reduction of the exposure limits might be considered. Implementation of control strategies and technical regulations to reduce the BZ concentration in air emissions should be attempted by use of Stage II vapour recovery system in fuel filling stations as early as possible. This technical improvement may offer significant advantages in biomonitoring and a unique chance for prospective studies on

biomarkers and cancer risk. There is necessity of education with motivation to change lifestyle to reduce the further deterioration of health state of workers. Regular inspections on the maintenance of prescribed ratios of chemicals in fuel, training to improve working conditions, use of safety measures and self service refuelling methods can also reduce the ill effects caused by volatile chemicals. There is need of intervention of regulations on hydrocarbon content in petrol and better use of cleaner fuels that could be safer to human health and are environment friendly. Further studies to develop bio-fuels and their safety assessments could help in the restoration of good health and well being of workers in occupational settings.