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BTEX is implicated in gasoline-induced oxidative stress in male albino Wistar rats

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The plasma and liver tissue hydrocarbon contents, superoxide dismutase (SOD) and catalase (CAT) activities, malondialdehyde (MDA) and glutathione (GSH) levels of rats orally exposed to gasoline were assessed in this study. Eighteen adult male albino *Wistar* rats (210.0±20.0 g), distributed into three groups, of six rats each were used in the study. Rats in groups one and two, which served as controls, were given distilled water and sunflower oil respectively, while rats in group three (test group) were given 2 ml/kg b.wt. of gasoline in sunflower oil vehicle, for thirty, sixty and ninety days. At the end of the respective exposure periods, the animals were sacrificed, and relevant tissues collected and processed for analyses. The types and concentrations of hydrocarbons in the plasma and liver tissues were analysed by gas chromatography with flame ionized detector (GC-FID), while SOD and CAT activities, MDA and GSH levels were analysed by standard spectrophotometric methods. The results obtained from this study showed the presence of benzene, toluene, ethylene and xylene (BTEX) in the plasma and liver tissues of rats exposed to gasoline at concentrations significantly ($p<0.05$) higher than the respective concentration recorded for the controls; and that the plasma and liver tissue MDA level was significantly ($p<0.05$) higher, while SOD, CAT and GSH activities were significantly ($p<0.05$) lower in test rats, compared respectively to the control groups. However, the plasma and liver tissue BTEX, MDA, SOD, CAT and GSH activities recorded in rats exposed for sixty and ninety days were significantly ($p<0.05$) different from the activities recorded in rats exposed for thirty days, while no significant ($p>0.05$) difference was recorded between sixty and ninety days of exposure. This suggests that BTEX are largely absorbed from the GIT, and distributed within the body tissues, including the blood and liver tissues, following sub-chronic oral exposure to gasoline. Hence, that the raised plasma and liver tissue MDA, and reduced SOD, CAT and GSH activities in test animals may be attributed to the raised tissue BTEX levels. The results of this study therefore give a strong indication that BTEX is likely implicated in gasoline induced oxidative stress in rats.

Biography

Friday E Uboh completed his PhD from University of Calabar, Calabar, Nigeria, and is presently an Associate Professor of Biochemistry, with Toxicology as his area of research interest. He served as the acting Head of Biochemistry Department in the Department of Biochemistry University of Calabar, Calabar, Nigeria, from 2011 to 2013. He is a member of Nigerian Society of Biochemistry and Molecular Biology, and Institute of Public Analysts of Nigeria. He has more than 60 papers published in reputable journals, and is a reviewer and Editorial Board Member of many journals of repute. He has also presented many conference papers locally and internationally.

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