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Haematological indicators of exposure to petroleum products in petroleum refining and distribution industry workers in Nigeria

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Background: Exposures to hazardous conditions in industrial environments often results in sundry health effects among workers. This informed this study aimed at investigating the haematological effects of occupational activities in the petroleum refining and distribution industry in Nigeria.

Methodology: Haematological indices were investigated in whole blood, using routine laboratory methods. The study was conducted on randomly selected workers of Port Harcourt Refining Company (PHRC) and Pipelines and Petroleum Product Marketing Company (PPMC) both in Alesa-Eleme near Port Harcourt, Nigeria, as well as non-oil work civil servants serving as control subjects.

Results and Conclusion: Results showed that in oil workers, Erythrocyte Sedimentation Rate (ESR) ranged 1-100 (Mean:10.94±11.82mm/h) in oil workers, against 1-36 (Mean:6.6±7.81mm/h) in non-oil workers (P<0.05); hemoglobin (Hb): 7.60-21.10 (13.19±1.31g/dl) vs. 9.10-14.90(13.01±1.54g/dl) (P>0.05); Parked Cell Volume (PCV): 25.00-58.00 (43.31±4.09%) vs. 30-49(42.70±5.01%) (P>0.05); Platelets: 75.00x109/L - 430.00x109/L(232.41±63.18x109/L) vs. 141.00 x109/L - 382.00 x109/L (239.23±57.30 x109/L) (P>0.05); White Blood Cell (WBC): 3.20 x109/L - 86.00x109/L(7.07±6.61 x109/L) vs. 4.9 x109/L - 11.00 x109/L(7.36±1.64 x109/L) (P>0.05). For the WBC differentials, the values were: lymphocytes: 18.00x109/L -75.00x109/L (52.28±9.25x109/L) vs. 25.00x109/L - 57.00x109/L (41.60±10.16x109/L) (P<0.01); and granulocytes: 25.00x109/L - 82.00x109/L (47.72±9.24x109/L) vs. 43 x109/L -75x109/L (58.40±10.16x109/L(P<0.01). Results showed that mean values were still within parametric reference ranges. However, Compared to the controls, some variations were observed in the oil workers: while granulocytes decreased significantly (P<0.01), significant increases occurred in ESR (P<0.05) and lymphocytes (P<0.01) respectively- indicating a possibility of functional alteration following haematopoietic toxicity in the oil workers. Findings suggest petroleum refining and distribution industry as being furnished with potentially haematotoxic substances, and haematopoietic toxicity as part of potential health effects of exposures in this industry in Nigeria. Though gender classification showed no appreciable impact, age grouping revealed that potential health effects indicated by the observed variations are likely to rear up from age 40 yrs and above. That exposure classification showed no dose-dependent distribution pattern meant that changes observed in age grouping (though insignificant), is simply an effect mediated by aging, implying that an aging worker is more amenable to exposure effects, thus creating a need for frequent environmental and biological monitoring for a safer and healthier workplace and workforce.

Biography

Tobias I Ndubuisi Ezejiofor obtained a BSc degree in Medical Laboratory Sciences (Rivers State University of Science & Technology, Port Harcourt), MSc Applied Biochemistry (Nnamdi Azikiwe University, Awka), and PhD Environmental Health Biology (Federal University of Technology, Owerri(FUTO), Nigeria. He is licensed by Environmental Health Officers Registration and Medical Laboratory Science Councils of Nigeria. A member of many professional associations and learned societies, he is a Fellow of the College of Biomedical Engineering and Technology (FCBET), Nigeria. He is a senior Lecturer and Heads the Occupational and Environmental Toxicology Research laboratory of the Department of Biotechnology, FUTO, Nigeria. He has published over 25 papers in reputed journals, and serving as reviewer to many such international journals. He had given several conference papers locally and internationally.

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