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Respiratory diseases due to occupational exposure to Nickel and Chromium among factory workers in Kenya

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Abstract

Inhalation of airborne nickel (Ni) and chromium (Cr) in workplaces causes a variety of respiratory ailments. This adversely affects the productivity of the employees. A study was therefore carried out in 6 plants, on 233 production workers, to investigate the influence of Ni and Cr exposure on their respiratory systems. Air samples were collected in the breathing zones of these workers and subsequently analysed for Ni and Cr using atomic absorption spectrophotometery. Information on the previous medical history of the workers was obtained using questionnaires. Their lung functions were further investigated using a spirometer in order to assess the influence of these metals on their respiratory functions. The study established that 26.2% of the workers had respiratory diseases that were associated with bronchitis, wheezing, shortness of breath, asthma, sneezing attacks and tonsillitis among other related symptoms. Most of these workers were from steel and scrap welding, leather tanneries and paint manufacturing plants. The breathing zone air of the afflicted workers had significantly high mean concentrations of 6.4 ± 4.4 µg/m3 Ni and 9.6 ± 5.3 µg/m3 Cr when compared to those who were not affected (4.9 ± 3.2 µg/m3 Ni and 4.4 ± 3.8 µg/m3 Cr). A high proportion of the workers also had reduced lung functions. All clinically diagnosed cases of both severe and mild airway obstructions were more than those that were self reported in the questionnaires. The study therefore recommended regular respiratory medical surveillance for workers in Cr and Ni related industries, for early intervention.

Biography

[1]Faridah is a Research Scientists with the Kenya Industrial Research and Development Institute. Her research interest is in both environmental and occupational exposure of heavy metals and related health effects among children and factory workers, respectively in Kenya. Currently, she is actively advocating for better health working conditions for the workers in processing industries. In particular, she is working closely with the relevant authorities to develop national guidelines on Occupational Lead Exposure. She has published several articles in the peer reviewed journals. She is also a part-time lecturer at the University of Nairobi, Kenya. She teaches safety methods in laboratory and other workplaces where she has jointly published a course book with the University of Nairobi Press. In addition, she was nominated as a national technical committee member for the Kenya Bureau of Standards involved in developing standards of solvents and chemicals

[2]Godfrey is a Lecturer and an Environmental Chemist with 12 and 17 years of teaching and research experience, respectively in the Department of Chemistry at the University of Nairobi. His area of specialization is toxic air pollutants in industrial and urban environments and their related health impacts in Kenya and he has published articles in the peer reviewed journals. He has a wide consultancy experience in the area of soil, water and air quality assessments including waste management. He is also a national technical committee member of the Kenya Bureau of Standards engaged in developing standards of Air Quality.