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Variations of some airborne trace elements concentrations as potential carcinogens**Heba M Adly, Saleh A K Saleh, Abdullah A Saati and Samir H Fatan**
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Backgrounds: Particulate matter (PM₁₀) may contain toxic trace elements that believed to be potent health risk factors due to their carcinogenicity. Makkah is the Muslim holy city in Saudi Arabia with a total population about 1.7 million, although it has limited industrial activities, it has unique characteristics every year, over 2.3 million of pilgrims stay in Makkah through hajj time which increase transportation pollution problems provoking undesigned amount of air elemental pollution.

Objective: This study aimed to determine the cancer risk for population exposed to four heavy metals (Cd, Cr, As, Be,) in ambient air.

Materials & Methods: The study was carried out in Arafat area, east of Makkah representing a highly-crowded area during Hajj time. Air samples were collected for 24 hours using mini volume sampler on a weekly base during summer and autumn 2014. Concentrations of PM₁₀ trace elements (Cd, Cr, As, Be) were analyzed using ICP-MS. Since there were no carcinogenicity risk data of trace elements known in Makkah, measurement of cancer risk of each metal was calculated in accordance to US-EPA.

Results & Conclusions: Atmospheric Cd, Cr, As concentrations were elevated in summer than autumn which are possibly due to high wind speed and temperature, an usual phenomenon in Saudi Arabia, leading to increase the atmospheric disturbance as a result of great amounts of dust resuspension from roadside and blowing sand particles. The cancer risk was found to be (1.08×10^{-4} , 7.21×10^{-4} , 4×10^{-6} , 4.6×10^{-6}) for Cd, Cr, As, Be respectively, transcending passable levels of inhalation risk for each element (10^{-6}) as adopted by US EPA. This study may serve as reference to develop air quality management strategy of airborne trace elements related to cancer risk directly affect pilgrims.

Biography

Heba M Adly is an Assistant Professor of Environmental Health - Faculty of Medicine, Umm Al-Qura University [UQU] and Consultant of Environmental Health. Her technical expertise includes Air Modeling, Environmental Chemistry, Gas Chromatography, Mass Spectrometry and Atomic Absorption. She is a Member of American Environmental Laboratory Accreditation Institute [NELAC], Chemical Institute of Canada [CIC] and American Association for Clinical Chemistry [AACC]. She is a member of many academic and administrative committees at UQU. She teaches and participates in numerous curricula at the Faculty of Medicine and Medical Sciences. Currently, she is working as a Project Manager for reformed curricula project between UQU and UCL Medical School. She has two running research projects: Assessment of cancer risk associated with long-term exposure of airborne some heavy metals in Makkah, KSA and Assessment of environmental and occupational exposure to mercury among dental staff and its impact on antioxidant capacity.

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