PD3: Concentrations and Health Risk Assessment of Heavy Metals in Road Dust in Kuala Lumpur

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ABSTRACT

Introduction: Heavy metal is one of the contributors of heavy metal pollution in the urban environment. The objectives were to determine and compare the concentration of chromium, copper, nickel, lead and zinc in three study locations and to calculate the carcinogenic and non-carcinogenic health risk of heavy metals. **Method:** Samples were collected from three sampling locations namely Jalan Titiwangsa, Jalan Imbi and Jalan Chow Kit. The concentration of heavy metals in road dust was analyzed by using inductively coupled plasma mass spectrometry. **Result:** The results from this study showed that zinc was the most abundant heavy metal overall, (95.74 ± 27.09 mg/kg) was detected at Jalan Titiwangsa, (65.26 ± 12.63 mg/kg) and (50.41 ± 3.92 mg/kg) were detected at Jalan Imbi and Jalan Chow Kit respectively. Statistical analysis showed that there was a difference of mean concentration for zinc in three study locations. The highest HQ value for all three study locations to both adults and children is through inhalation, ingestion and dermal contact. Both HQ and HI values for five heavy metals are below the safe level which is less than the value of 1, which is the standard for health risk assessment of heavy metals for both adults and children. Besides that, the risk of cancer for chromium to both adults and children through inhalation at all three study locations were above the acceptable level of 1 x 10-6. **Conclusion:** Calculated health risk suggested that there was an acceptable potential health effects caused by the road dust.

KEY WORDS:
Heavy metals, health risk, road dust

PD4: An fMRI Study of Working Memory in Moderate-TBI Patients: Results from Preliminary Data

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ABSTRACT

Introduction: Patients diagnosed with traumatic brain injury (TBI) often report impairments in cognitive functioning that interfere with their daily lives. The present preliminary study looks at brain responses to a working memory task (i.e. n-back task) in healthy participants and participants with moderate TBI using functional Magnetic Resonance Imaging (fMRI). **Method:** Seven Malay males (5 controls and 2 moderate-TBI participants) underwent the visual n-back task, which consisted of four conditions: 0-, 1-, 2-, and 3-back, during scanning using a 3.0-T scanner (Achieva, Philips, the Netherlands). The functional images were preprocessed and analyzed using MATLAB 8.3 R2014a and Statistical Parametric Mapping 12 (SPM12) software. Two fixed-effects analyses (FFX) were performed for the respective groups, and the activated brain regions were identified using the WFU PickAtlas software at a significant statistical inference FWE of α= .001 for multiple comparisons. **Results:** The healthy subjects displayed significantly elevated activations in their bilateral middle frontal gyri across all conditions except for 1-back (P_{FWE}< .001, t > 11.86), with more clusters being significantly activated in the gyri as memory load increased. On the other hand, the moderate-TBI participants exhibited significant activations in their bilateral superior parietal cortex during the 2- and 3-back conditions (P_{FWE} < .001, t > 11. 81), which were not observed in the healthy subjects. **Conclusion:** This preliminary study on working memory demonstrates that brain activations differ between healthy and TBI participants. It paves the way for understanding working memory and its underlying brain responses in individuals with moderate-TBI.

KEY WORDS:
fMRI, traumatic brain injury, working memory