Blood Lead Concentration and Working Memory Ability on Malay Primary School Children in Urban and Rural Area, Malacca

ABSTRACT

The most lead concentrations in the environment come from human activities such as burning fossil fuels, mining and manufacturing. Once lead enters into environment, it does not break down, but lead compounds were changed by sunlight, air and water. The main target for lead toxicity is nervous system. A child's mental and physical growth can be affected even at low levels of exposure. Objective of this study was to determine the relationship between blood lead concentration and working memory ability among primary school children in urban and rural area, Melaka. The final number of 111 respondents participates in this study which represents 37 from urban area and 74 from rural area. The biological indicator for lead exposure was blood sample. WMI consist of Digit Span as a subtest which comprise of Digit Span Forward (auditory short-term memory) and Digit Span Backward (auditory working memory). The mean of blood lead concentration for urban children was 8.51±3.61µg/dL and rural children were 6.86±4.63µg/dL. There was significant difference of blood lead concentration between urban and rural children (t=2.061, p=0.042). Result showed the mean of WMI score for urban children was 82.03±12.55 and rural children the mean score of WMI was 87.30±13.88. There was significant different of WMI score between urban and rural children (t=-2.012, p=0.048). Result showed there was significant inversely correlation of WMI score with blood lead concentration among urban (r=-0.417, p=0.010) and rural (r=-0.369, p=0.001) children, and there was no association of socio-economic variables with WMI score. This study had made the conclusions; there was significant difference of blood lead concentration among urban and rural children. Urban children state high concentration rather than rural children. There was a significant difference of working memory ability among urban and rural children. Urban children showed lower score compared to rural children. There was inversely significant correlation between blood lead concentration and working memory ability among primary school children in urban and rural area, Melaka.