ASSESSMENT OF POTENTIALLY TOXIC ELEMENTS EXPOSURE IN PLAYGROUNDS AT A DAYCARE CENTER: ASSOCIATION WITH CHILDREN'S CHEMICAL EXPOSURE

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INTRODUCTION: Potentially Toxic Elements (PTEs) include metals (Pb, Cd, Cr, Cu, Hg, Ni, Sn, Zn), as well as metalloids (As), which are associated with health problems such as skin diseases, cognitive and attention deficits, hyperactivity, and lung, liver, and kidney cancers. Children are especially vulnerable to PTEs exposure, as biological systems are not fully developed. **OBJECTIVE:** To assess the PTEs exposure of children who attend a university daycare center (DCC) in São Paulo. **MATERIALS AND METHODS:** PTEs concentrations were evaluated on the daycare playgrounds using a portable X-ray fluorescence spectrometer, focusing on toys, tableware utensils, playsets, and other available objects. Venous blood samples were collected and PTEs blood levels were determined by Inductively Coupled Plasma Mass Spectrometry. **RESULTS:** 29 children (14 male; 15 female), aged between 1.4 and 6.3 years (mean = 4.6 years) participated in the study and blood PTEs means concentrations were 9.4, 0.9, 1369.6, 4.9, 0.3 and 4577.4 µg/L for Pb, Cr, Cu, Ni, As and Zn, respectively. For Cd concentration, values were below LOQ for all blood samples. No statistical differences were observed between the gender of the children and the age. Regarding the utensils analyzed (n = 72) by XRF, 22.2% of the analyzed plastic items showed Pb concentrations higher than 90 mg/kg, and 9.7% showed Cd concentrations greater than 75 mg/kg. **CONCLUSION:** The results for PTEs in blood were all below the limits established by relevant regulations. However, it is important to note that for some elements, such as lead, there are no known safe levels of exposure. Moreover, the daycare center (DCC), where children may spend up to 10 hours a day, represents only one of several potential sources of exposure to these elements. These findings are valuable for identifying and managing sources of PTEs exposure and contribute to the scientific evidence needed to inform public health policies aimed at reducing children's exposure.

Keywords: Potentially Toxic Elements; Children; Biomonitoring; Daycare Centers; Playgrounds.

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