EFFECT OF LEAD LEVELS IN BREAST MILK ON THE ESTIMATED INFANT DAILY INTAKE OF LEAD

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Abstract: The World Health Assembly recommends exclusive breastfeeding of infants until 6 months of age. Breast milk is the first food for infants and it serves as a major nutrient source for biological functions and growth during the early stages of life. However, maternal milk may sometimes contain chemical contaminants, which could have adverse effects on neonates or nursing infants. Women are chronically exposed to environmental lead since infancy, and they accumulate a significant bone lead burden into the child-bearing age. Maternal body burden and current exposure are major lead sources for the fetus, because lead can pass through the placenta. Mobilization of maternal bone lead into blood during lactation is favored by the increased bone turnover secondary to the increased calcium demand peculiar to this period. The contribution of lead in the breast milk, as the only dietary source, to the blood lead level of newborns was estimated, from lead isotopic measurements, to be in the range of 40-65%. The objective of this study was to establish the Hazard Index (HI) of the children's exposure to lead through maternal milk. From January to July of 2007 milk lead levels of 92 usual milk donor women from the Bank of Milk of University Hospital of Londrina, State of Paraná, Brazil, were assessed. Although the concentrations of the metal found in the milk were low (median equal to 3.0 μg/L, varying from 1.0 to 8.0 μg/L), the exposure of infants through the breast-feeding can be extended in time. The Hazard Index is the ratio between a parameter of exposure and the reference dose. A HI exceeding 1.0 indicates that infant consuming breast milk has a potential health risk. For the lead levels in the breast milk obtained in the present study, the HI ranged from 0.055 to 0.329. It means that the body burden of lead in the infants was not affected by the exclusive consume of breast milk.

Key words: lead exposure, lead in human milk, Hazard Index, nursing infants.