Abstract

Objective. Lead poisoning can, in some cases, be traced to a specific route or source of exposure on the basis of the individual's blood lead isotope ratio. To assess the major source of lead exposure among women residing in Mexico City, we compared blood, ceramic, and gasoline lead isotope ratios.

Material and Methods. The study population, randomly selected from participants of a large trial, (1/1996-12/1996) comprised of 16 women whose lead levels exceeded 10 g/dl and who reported using lead-glazed ceramics. Lead isotope ratios were performed on a PerkinElmer 5000 Inductively Coupled Plasma Mass Spectrometer (ICP-MS) interfaced with a Perkin Elmer HGA-600MSElectrothermal Vaporization System (ETV). Results. The isotope ratios (206Pb/204Pb, 207Pb/204Pb, and 208Pb/204Pb) of both the blood specimens and their corresponding ceramic specimens were highly correlated, with r=0.9979, r2=0.9958, r=0.9957, r2=0.9915 and r=0.9945, r2=0.9890 values for the three isotope ratios, respectively, suggesting that the lead exposure most likely resulted from the use of these ceramic. Measurements of lead isotope ratios from leaded gasoline in use at the time of blood sampling, differed from those in blood and ceramics. Conclusions. Determining lead isotope ratios can be an efficient tool to identify a major source of lead exposure and to support the implementation of public health prevention and control measures.

Keywords

lead; ceramics; inductively coupled plasma mass spectrometry; Mexico