

Establishing a protocol for trace element determinations in serum samples from healthy elderly population in São Paulo city, SP, Brazil

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There is an increasing interest of trace element determinations in serum samples to investigate their vital role in human metabolism, as well as, to provide an important basis for clinical disorders and intoxication diagnosis. However, data of reference values or reference intervals of elemental concentrations in sera are very scarce since these determinations require the establishment of an adequate protocol for sampling, reference population selection, control of possible sample contamination and quality control of the analytical results. In this study a protocol for trace element determination in serum was defined and preliminary results were obtained for samples from healthy elderly volunteers attended at the Hospital das Clínicas of the São Paulo University, Medical School. The analyses of serum from elderly population are relevant to study the association of the level of elements found in this population group with problems in aging. The blood contamination of trace elements leached from sampling and storage devices were evaluated using diluted nitric acid solution. The blood was also collected using, both, polypropene intravenous cannula mounted on a trocar and stainless-steel needles, and these results showed there is no difference for the elements analyzed in this study. Haemolyzed samples could not be considered for the analyses. The donors were submitted for medical history, biochemical exams and they were selected based on the SENIEUR protocol. Blood samples were collected in tubes without anticoagulant and the serum was separated by centrifugation. The freeze-dried serum samples were analyzed by instrumental neutron activation analysis and the elements Br, Ca, Cl, Fe, Na, Rb, Se and Zn were determined. These results were within the accepted value ranges used by doctors for a normal population. The certified reference material NIST 1566b Oyster Tissue was analyzed for the evaluation of the accuracy and precision of the results.