PIXE analysis of urinary concentrations of trace elements in health survey

Keiko Chiba[1)], Masahito Aminaka[2)], Hiroshi Yamauchi[2)], Kouichiro Sera[3)]

[1)] Science of Living Department, Morioka Junior College, Iwate Prefectural University
152-52 Sugo, Takizawa, Iwate 020-0193, Japan

[2)] Department of Preventive Medicine, St. Marianna University School of Medicine
2-16-1 Sugao, Miyamae, Kawasaki, Kanagawa 216-8511, Japan

[3)] Cyclotron Research Center, Iwate Medical University
348-58 Tamegamori, Takizawa, Iwate 020-0173, Japan

Abstract

The present study was designed to investigate the oxidative stress caused by environmental trace elements. By using PIXE analysis, we determined the urinary concentration of trace elements in 150 persons who eat high levels of marine products. It was expected that the trace elements in urine would be reflected in the high intake of marine products.

The following results were obtained. The urinary concentrations of many trace elements in subjects are higher than normal levels for both Japanese males and females. Mn, Fe and Zn concentrations in urine were higher in males than females; conversely, the urinary levels of Ca, Rb, Pb, Cu, Hg, Br, Sr, Na, Mg, Al, S, Cl and K were higher in females than males. However, there were no significant sex-differences for all the elements.