

Trace Elements in the Breath and Morbid State

Yasuaki Arakawa

Department of Hygiene & Preventive Medicine

Faculty of Health Sciences

The University of Shizuoka

Summary

To investigate the relationship between trace elements in the breath and morbid state, the element balances in the breath of various kind of patients were analyzed by using a thermal neutron activation analysis method. Of 22 elements, 16 elements such as Cl, Br, I, Na, K, Ca, Mg, Al, Mn, Zn, S, Fe, Co, Cr, V and Sc were found in the breath. In lung diseases, a significant increase in percentage of Fe and decreases in percentage of Na, Al, Zn were observed. In diabetes, increases in percentage of Ca, V and a decrease in percentage of Zn were observed. In cerebral vascular diseases, increases in percentage of Cl, Na and decreases in percentage of Zn, Ca, S were observed. In hypertensive lung diseases, increases in percentage of K, Br and decreases in percentage of S, Al, Zn, I were observed. In hypertensive diabetes increases in percentage of K, Mn and decreases in percentage of Al, I were observed. In hypertensive heart diseases, increases in percentage of K, Mn and decreases in percentage of Al, Zn were observed. In a complication of diabetes and liver diseases, increases in percentage of Na, Zn, Cr, Co, I, Mn and a decrease in percentage of S were observed. In a complication of cerebral vascular diseases and heart diseases, increases in percentage of S, Mn and decreases in percentage of Cl, Ca, I were observed.

These results revealed that the excretion of trace elements into the breath changed significantly and specifically depending on morbid state. The excretion mechanism of the specific trace elements into the breath are now under investigation.