HEAVY METALS IN THE URINARY CALCULI

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Key Words: Atomic Absorption Spectroscopy, FTIR-spectroscopy, heavy metals, urinary calculi, pollution

Heavy metals contents in the renal calculi might reflect level of contamination in human environments, because it is well know that heavy metals such as lead, cadmium, copper, zinc absorbed from intestine and excreted in the urine and even bile through the urinary and respectively biliary tracts. Heavy metals deposition in the kidneys may damage kidney ducts. The present study is focused on the concentration of heavy metals in human renal calculi. The valuation a level of heavy elements in urinary stone might a clue to the problem of environmental pollution.

In the present study it was investigated a total number of 159 urinary calculi. The samples of renal calculi (extracted surgically and spontaneously eliminated) were collected from the adult patients of different sex and age admitted to the Clinic of Urology Timisoara and Craiova, Targu-Jiu Hospital – Urology Department. We have been established their type according to the qualitative composition, by Fourier transfer infrared spectroscopy. In the next step, we investigated the distribution of metals in calculi by means of atomic absorption spectroscopy. Among all urolithiasis a number of 48 are simple and 111 mixed.

The environment influences the some heavy metals concentration in kidney stones. The metal concentrations are considerably increased in the case of polluted environment (with a percent between 5 – to 20 %, depending of metals).

Also, in our study we have observed that differences in metal concentrations depend on chemical composition of urinary stone as well as on the structure. In mixed oxalate-phosphate urolithiasis, especially oxalate carbonate-apatite the metal concentrations are high compared with others. In nucleus of calculus there is a higher concentration of metals compared with external level. The examination of the relationships between urine concentration in calcium or other solutes and the amount of metals in calcium stones represents will be performed in further study.

References