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Assessment the relationship between kidney stone formation and river water by EDX

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Abstract. Urinary stones a worldwide problem for affecting more number of people. The urinary stones which formed to the deposition of few minerals & crystalline materials. Urinary stone samples are analyze by X-ray diffraction and electron microscopy. The present study have been to identify the minerals and elements, those are present in urinary stones and attempt to establish its morphological structure and elemental compositions. In the present study the minerals and morphological changes of different samples of human urinary stones are evaluated using XRD & SEM methods and the relationship with river water. The urinary samples are analyzed to identify the concentration of elements such as it Ca, Cu, Fe, K, Mg, Na, P, S and Zn by EDX method, also study some physical and chemical properties of river water and the relation with kidney stone formation.

Keyword: Kidney Stone, Energy Dispersive X-ray, Drink Water, Urinary stone, X-ray diffraction, Scanning electron microscopy, physical and chemical Properties.

1. Introduction

Urinary tract was drainage system for removing wastes from the body and increased water. The kidney stones were solid piece of material which forms in kidney from high levels of substances in urine (1). These substance was found in urine and do not cause clear problems at found in lower levels(2). Stone may be stay in kidney when small in size or travel out side from the body (3). This stones were different in size , there it one small , middle and another big (3). larger stone may be stay in get stuck in urinary tract and causing more severe pain and bleeding(5).The present study of minerals and morphological changes for different samples often urinary stones were evaluated by use XRD & SEM methods(6). Urinary stone sample was analyzed at the concentration from elements such as Ca, Cu, Fe, K, Mg, Na, P, S & Zn by EDX method (7).

2. Materials and Method:

The samples of Urinary tract stone were collected from AL-Sadar Hospital. The stones of Urinary tract washed by deionized water to removable debris like blood and waste. The urinary stone was kept for analysis. Stone dried by oven at 60 °C to one hour for remove moisture content and dried stone sample



was ground in fine powder by used agate mortar and pestle. XRD pattern of well powdered sample was characterized from through X-ray diffraction.

3. Result and Discussion:

The stones in kidney may can form by mineral substances in urine solution like oxalate, calcium; and phosphorus that when become highly concentrated. The foods and water causes stone formation in any people were susceptible, but specialized scientists did not believe that water and eating any specialized for causes the stones in kidney to form in people but another they believe that eating and water it were the causes of stones (8). The People who do not river water by enough may also were at most higher risk and urine were very more concentration (9). The people who were increased risk to form of kidney stones in kidney were those it with, from mentioned above, metals when at present in excessive amounts can decreased of water quality and causes pollution of waters (10). The nature of nutrition has an effect on the formation of kidney stones (11). High level of calcium was one of the most important causes of kidney stones (12). The high calcium in urine may be result to the way body handles with calcium in food, was not always to how much content of calcium in nutrition (13) . Low of amount calcium in your food loosely stops stones form (14). The showed results that restricting calcium in food may be bad to bone health and increase stone in kidney (15). Health care usually do limit of calcium in nutrition to low calcium in urine (16).

Under the influence of environmental factors such as (physical, chemical and biological), the concentrations of metals in water are liable of change from position to another (17). The behavior of the tested (calcium, magnesium and phosphate) concentrations are clearly presented in Figures (2 & 4), from these figures the changing of each elements in the water different from each element to another. The concentrations of these metals are registered for many samples of water. This study for determines the concentrations of many element of metals and characterize of water in AL-Najaf city. Urinary samples of people have kidney stones were analyzed in this study by exam X-ray diffraction technique. The result showed that 8 urinary stone samples contain a mixture of calcium phosphate, calcium oxalate monohydrate and major constituents of calcium oxalate monohydrate and calcium phosphate (18). The results showed by test XRD patterns were indicate a high level from, calcium phosphate , calcium oxalate and were known to crystalline in monoclinic and hexagonal system (19). This results agreed with test FT-IR results (20). The urinary stone samples were analyzed by used scanning electron microscopy with energy dispersive X-ray spectroscopy, from this test the results showed that morphological of urinary stone samples which indicated that calcium oxalate monohydrate and calcium phosphate crystals are appeared in irregular granular crystalline and spherical shape and it was confirm the presence of calcium oxalate monohydrate and calcium phosphate, also the result high concentration of TDS , Turbidly and EC which have direct relation with kidney stone formation . Figure (1).

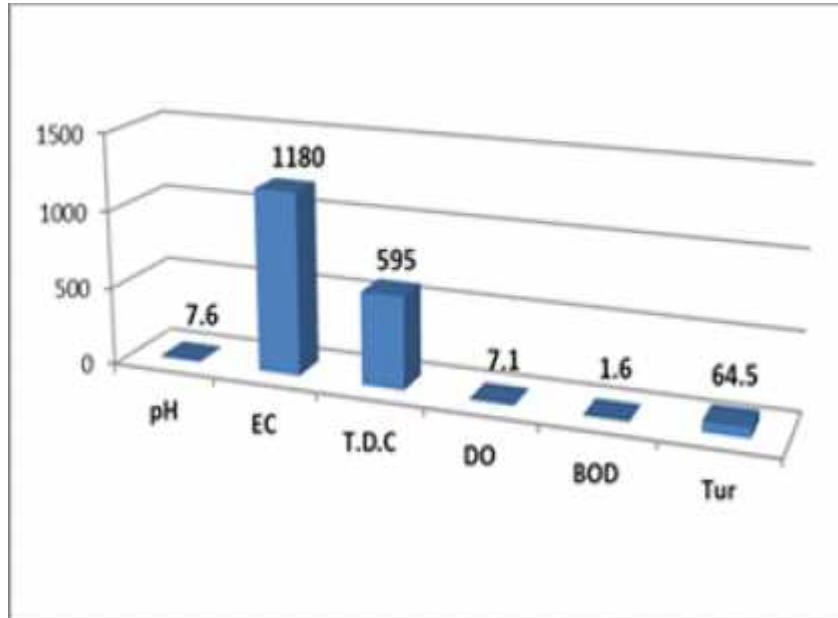


Figure (1) Chemical parameters to rivering water.

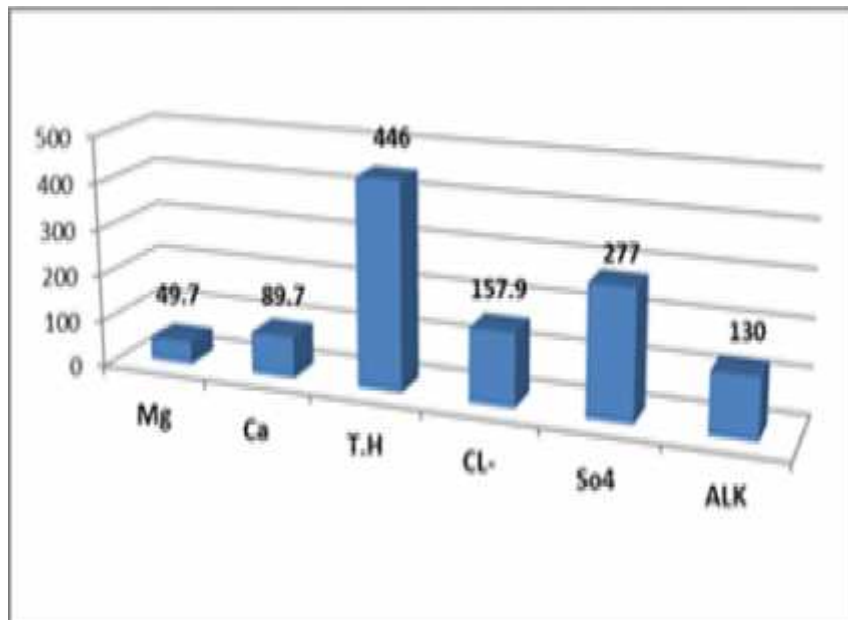


Figure (2) Mineral substances by filter electron microscope to rivering water.

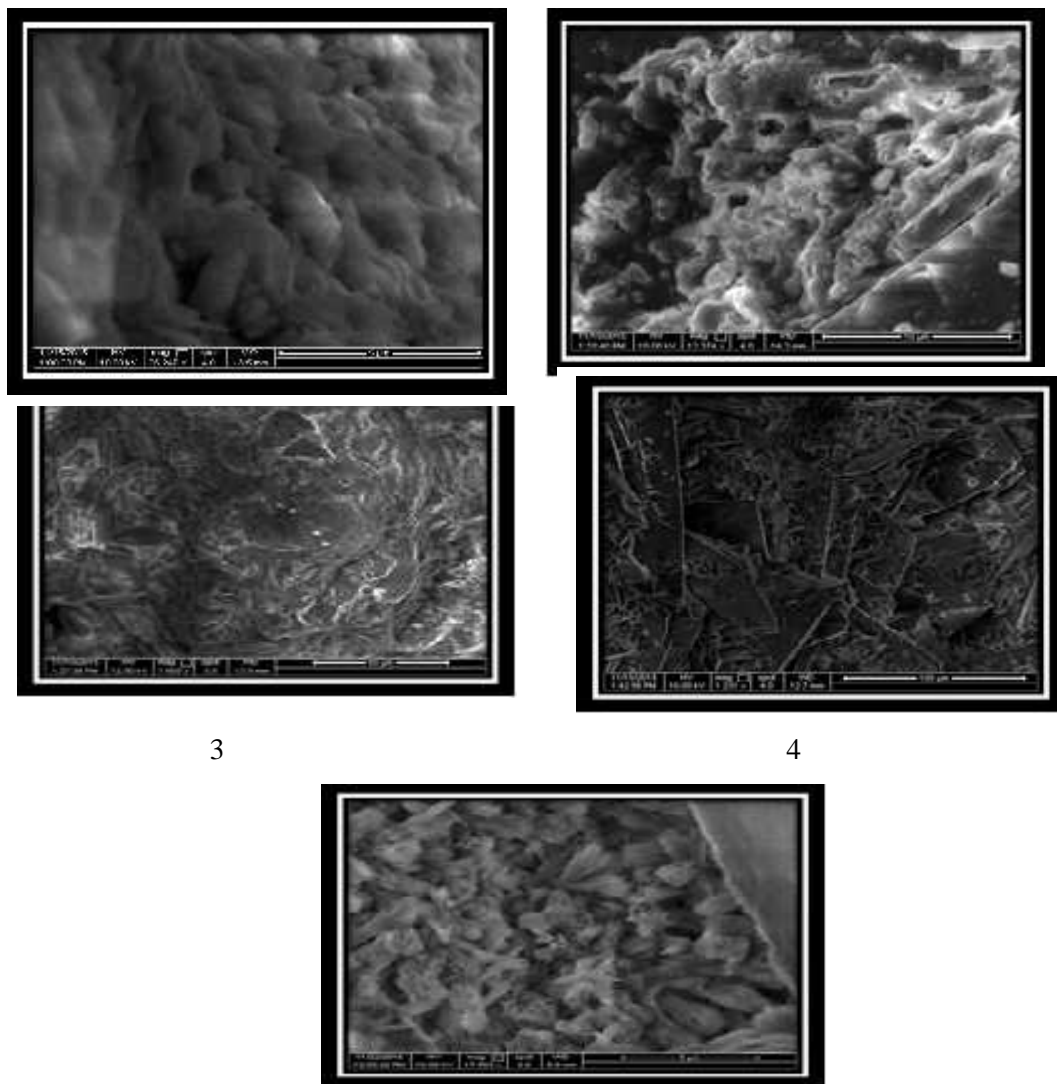


Figure (3) Scanning electron microscope to five urinary stone samples contain a mixture of calcium oxalate monohydrate and calcium phosphate and major constituents of calcium oxalate monohydrate & calcium phosphate.

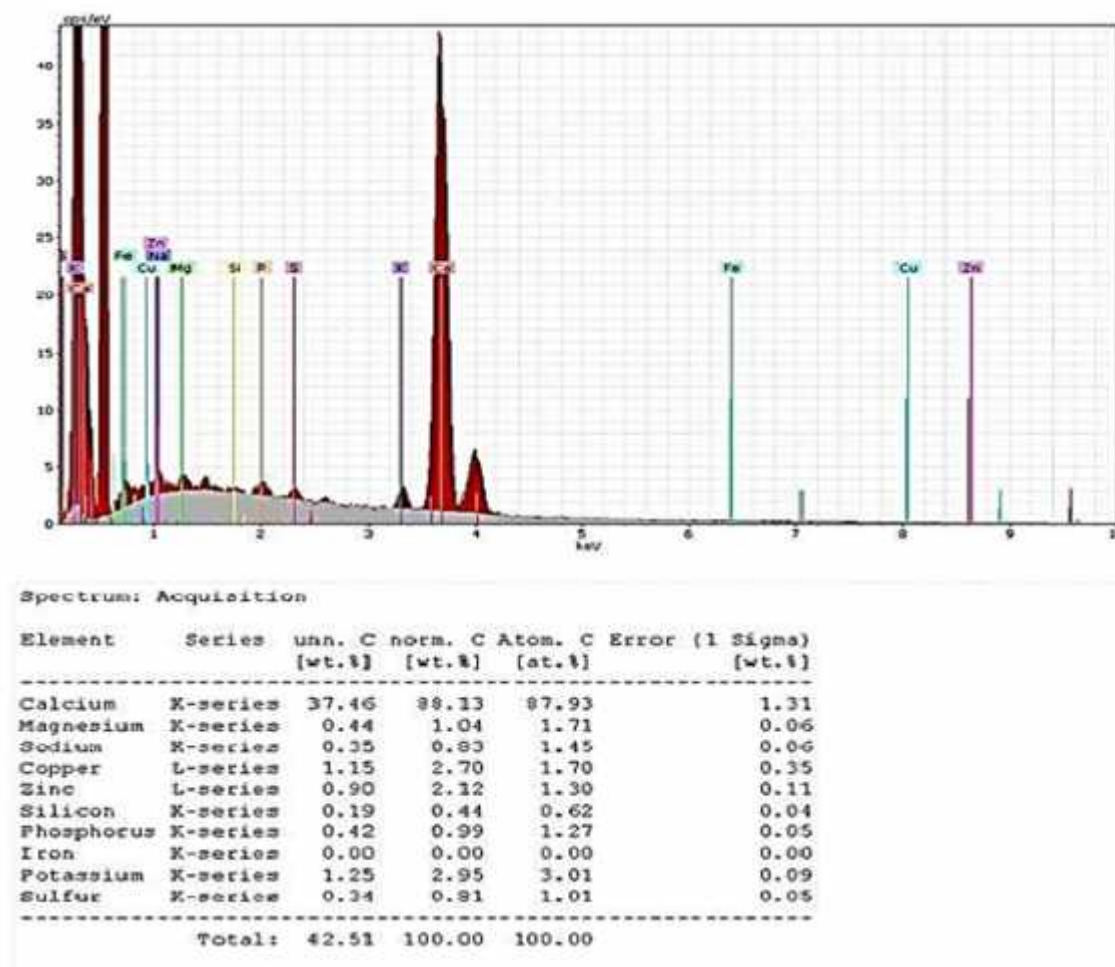


Figure (4) Mineral substances by filter electron microscope to urinary stone samples contain a mixture of elements.

4. Conclusions:

The conclusions of results indicates that stones in kidney having different shape and structures in minerals of calcium phosphate, calcium oxalate monohydrate, calcium oxalate dihydrate, calcium phosphate hydroxide and uric acid, respectively; were identified by SEM-EDX and XRD techniques which indicates the strong relation between chemical properties of water especially the calcium

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