

THE STUDY OF CALCIUM OXALATE FROM URINE

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Abstract

The analysis of the biochemical and cellular parameters from the urine and urinary sediments tests is proven to be necessary in order to offer information about the good functioning of the kidneys and of finding the possible affections. The analyses were accomplished at a number of 150 subjects from which 85 are represented by the masculine sex, and 65 by the feminine sex.

The chemical and cellular parameters from the urinary sediment tested are represented by: Calcium oxalates. The abundance of the Calcium oxalate in the urinary sediment at the subjects of feminine and masculine sex indicate the existence of urinary calculi. The most frequent affections determined on the basis of the biochemical analyses and of the urinary sediment seem to be the hepatic affections, the urinary infections and the urinary calculi.

Keywords: crystals, Calcium oxalate, alkaline, microcalculi

INTRODUCTION

The presence of the crystals in the urine is dependent on the alimentation and the urinary pH. The majority of the crystals have a limited clinical value, significant is only when they are present in "the mass". They don't indicate and don't lead necessarily to gravel.

The oxalate is the final product of metabolism of Glico oxalate and glyceride. The human body doesn't have enzymes capable to degrade the oxalate; as a consequence it has to be eliminated by the kidney. On the tubular level the oxalate is combined with the Calcium determining the forming of calculi of Calcium oxalate and the increased concentrations of oxalate can be toxic for the kidney cells.

Hyperoxaluria can be:

- primary, having at the basis the genetic enzymatic deficits;
- secondary to some gastric intestinal affections that determine malabsorption or an increased alimentary ingestion of products rich in oxalate or vitamin C.

The methods of determination are different so: a useful method for determining the relative saturation of the urine with Calcium oxalate is that which uses the titration of the Calcium oxalate and measures the modification of the concentration that induces the increase of oxalate. The

kidney calculi seem to be the result of a crystallization of the urine if it is supra saturated with 5 minerals.

The paper contains the results of the analysis of the urine tests and urinary sediment at the tested subjects and are represented by the concentration of Calcium oxalate.

MATERIAL AND METHODS

In order to accomplish the proposed objective was used a prospective study.

In this regard was created a group of 150 patients that come from the wards of the County Clinical Emergency Hospital Oradea.

48 hours before the harvest, the treatment with the Vitamin C or the alimentary supplement of vitamin C from eggs, critics, broccoli, tomatoes, bell peppers, potatoes. An increased ingestion of vitamin C (> 2g/day) can determine the results falsely increased of the urinary excretion of oxalate.

Isharvestedthe urine from 24 hours: at 7 o'clock in the morning the patient urines and doesn't keep this urine; then he collects in a clean vessel of 2-3 liters all the urine emissions until 7 o'clock in the morning the next day, including; homogenizes (by agitation) the harvested urine; measures the entire quantity; retains approximately 20 ml, in a disposable plastic cup for urine; the test is kept at 2- 8°C during the collecting and afterwards, until it is tested efectively³.

The harvesting recipient isrepresented by a vessel of 2 – 3 liters and a disposable plastic cup for urine, on which is noted the total quantity of urine from 24 hours³.

Optimum volume of testis of 10 mL³.

Causes of rejection of test– recipient of urinemaintained at the room temperature³.

Stability of the test– refrigerated urine at 2-8 °C is stable for 7 days³.

Method – chromatography of liquids coupled with spectrometry of table (LC-MS/MS)³.

Reference values– < 44 mg/24h³.

RESULTS

From the analysis of the evolution among the two sexes, the masculine and feminine sex, is registered an increased report at the masculine sex of 57% of the Calcium oxalate and at the feminine sex a percentage of 43%.

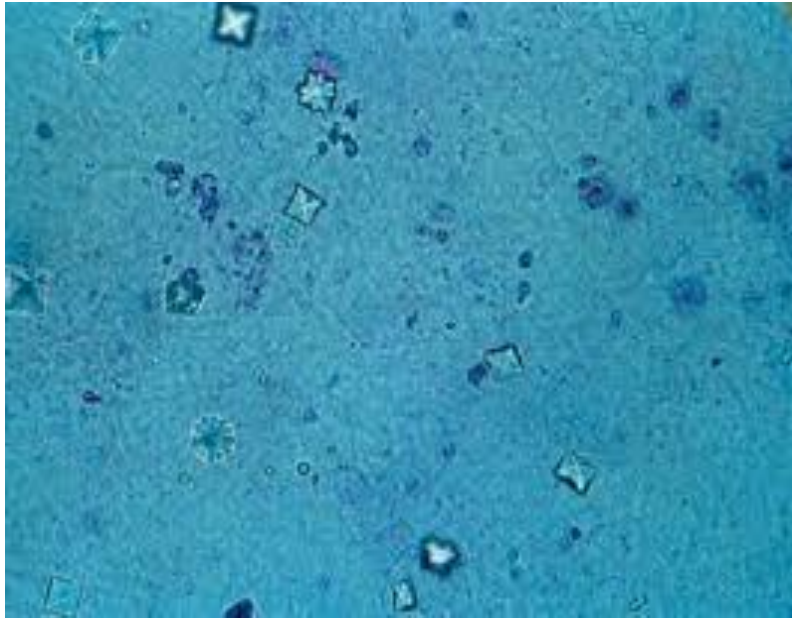


Fig.1. Urinary Calcium oxalate(www.wordpress.com)

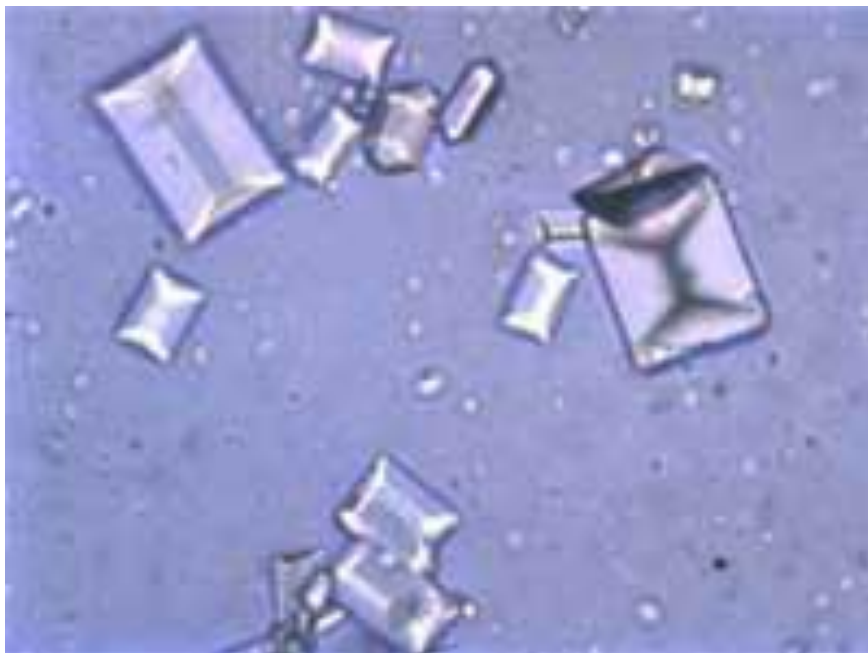


Fig.2. Urinary Calcium oxalate(www.petsmile.ro)

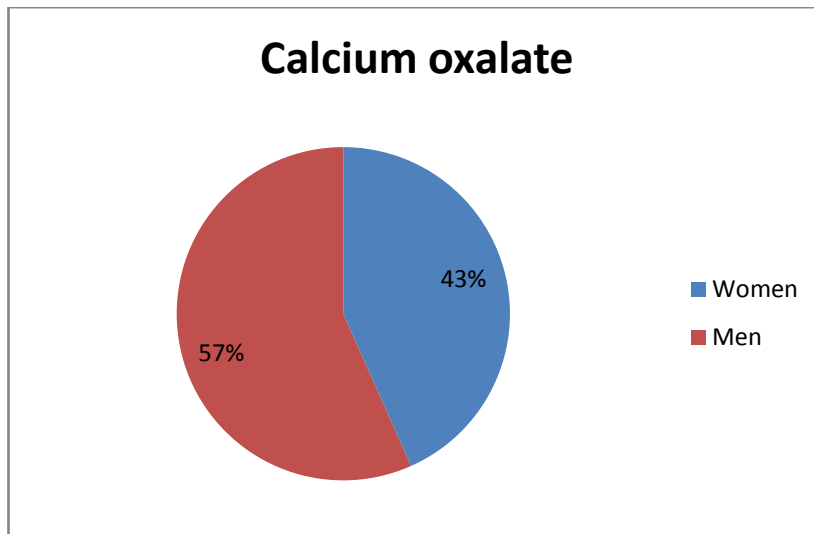


Fig. 3. Parameters from the urinary sediment at subjects of masculine and feminine sex

DISCUSSIONS

A high level of urinary oxalate increases the risk of forming of kidney calculi and suggests:

- affections that determine secondary hyperoxaluria by malabsorption;
- primary hyperoxaluria, by deficit of the enzyme alanine glyoxalatetransferases or glyceride dehydrogenasis;
- idiopathic hyperoxaluria;
- alimentary excess of oxalate or vitamin C.

The results obtained and processed underlined an increase of the concentration of crystals of Calcium oxalate at the masculine sex of 57%.

CONCLUSIONS

The abundance of the crystals of Calcium Oxalate in the urinary sediment at the subjects of feminine and masculine sex indicate the existence of urinary calculi. The most frequent affections determined on the basis of the urinary sediment seem to be the urinary infections and urinary calculi.

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