

Types of Kidneys Stones Isolate from Iraqi Patients in Najaf Governorate

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Abstract

Kidney stones are mineral deposits in the renal calyces and pelvis that are found free or attached to the renal papillae. They contain crystalline and organic components and are formed when the urine becomes supersaturated with respect to a mineral. Calcium oxalate is the main constituent of most stones, many of which form on a foundation of calcium phosphate called Randall's plaques, which are present on the renal papillary surface. Obesity, diabetes, hypertension and metabolic syndrome are considered risk factors for stone formation, which, in turn, can lead to hypertension, chronic kidney disease and end-stage renal disease. This study was conducted on 260 patients with Kidney stones (188 males and 72 females) Samples were collected during a period from 1/10/2021 to 1/3/2022. The results showed that we noticed that whewellite stones are the most numerous, numbering 140, uric acid, 56, weddellite 25, carbonate apatite 26, while cystine and struvite range in numbers from 6 to 7.

Keywords: Kidney stones, FT-IR, whewellite.

1. Introduction

Kidney stone disease covers many conditions causing kidney, ureteric or bladder stones. These include metabolic and inherited disorders, anatomical defects of the upper or lower urinary tract, and chronic urinary infection. However, most cases of renal stones are idiopathic and present with loin or abdominal pain, and macro- or microscopic hematuria, leading to the eventual passage of a stone and resolution, or the need for further investigation and intervention. Renal stones often recur, and the underlying causes need to be investigated, particularly as stones can be related to lifestyle and they are often associated with diseases such as hypertension or diabetes. Although clinical management may seem simple, and largely surgical, the increasing prevalence of renal stone disease in Western society is becoming a significant economic and health burden [10]. Currently, there is no satisfactory drug to cure and/or prevent kidney stone recurrences. Thus, further understanding of the pathophysiology of kidney stone formation is a research area to manage urolithiasis using new drugs. Therefore, this review has intended to provide a compiled up-to-date information on kidney stone etiology, pathogenesis, and prevention approaches. [1]

2. Methods

This study was carried out on 260 patients of kidney stones. they were 188 males and 72 females. Their age ranged between 20 to 70 years. This study was conducted in the kidney center / Al-Sader hospital in AL-Najaf city/ Iraq during the period from 1st October 2021 -1st March 2022. the patients age group ranging between 10-60 years they were diagnosed clinically and were not on any topical or

systemic treatment in the past 3 months. Patients with autoimmune disease, pregnant or lactating women, immunosuppression)were excluded from study. All patients were subjected to complete general and clinical examination to detect any exploded factors and dermatological examination to evaluate the type and disease severity. Healthy control group included 50 individuals with age –and –sex matching to patients were also collected.

Detection the type of kidney stone

The detection of kidney stones diagnosed by (FTIR) device. Fourier transform infrared spectrometer (FT-IR) is a technology used to obtain an infrared spectrum for the absorption or emission of a solid, liquid, or gaseous substance. The Fourier spectrometer simultaneously collects high-resolution spectral data over a wide spectral range. This provides a significant advantage over a scattering spectrometer, which measures intensities over a narrow range of wavelengths simultaneously. Most of the infrared spectrometers used are double beams, that is, they are double beam spectrometers, because the low infrared energy, the instability of the light source and the unit of measurement, and the necessity to enlarge the resulting weak electrical signals make the two-beam design necessary for these devices. In these devices, the source rays are separated into two equal beams by means of a rotating mirror and a light interrupter, where the source rays alternately oscillate between the sample cell and the reference cell. Finally, the sample beam passes alternately to the ray analysis unit.

3. Results and Discussion

The results show that the large number of patients

among (40-50 y) were 63 while lowest number of patients among (20 – 30 y) were 34. The types of kidney stones were: Whewellite 140, U.A kidney stones 25, Carbonate apatite 26, Cystine 7 and Struvite 6. The FTIR examination for kidney stone show that Most of the kidney stone was mixed. And the major compound in stones is whewellite which is similar to the results of Khan ,he found that calcium oxalate monohydrate was the most common crystal 2. Also other researchers found that The major component detected was CaOx monohydrate (COM, 52.5%). 3 Found that the stones consisted mainly of calcium with the presence of phosphate due to hydroxyapatite. That is the main renal stone component according to the literature, with 80% of kidney stones containing calcium 4. Also other researchers founded that major peaks of kidney stone was carbon (C), calcium (Ca), oxygen (O), and phosphorus(P) 5. Men were more likely to report a history of stone disease than women that result similar with other research. 6 The changing epidemiology of kidney stone disease was not limited to one specific demographic cohort; increasing prevalence of stones was noted in all age, gender, and racial/ ethnic groups, even on a population-adjusted basis. Among men, the overall prevalence of stone disease increased from 6.3% in 1988–1994 to a population-adjusted 10.3% in 2007–2010 in USA. This increase is likely related to dietary and lifestyle factors. Given the temporary disability imposed by a symptomatic stone event. The recurrence rate in patients with calcium oxalate (CaOx) stone disease is well recognized and the importance of methods with the aim of arresting or at least decreasing. 7 8 During the past years, we have got increased insights in the nature of CaOx stone formation and it is suggested that the improved understanding of this process can be used for a more dynamic risk evaluation and treatment regimen directed to specific risk periods that can be identified in the individual patients. 9

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