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A study on renal stones incidence with regard to age, gender and chemical composition of stones in Western Iraq

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Abstract--This study was done to calculate the incidence of urinary stones in relation to age, gender and chemical composition of urinary stone. Moreover, the study was conducted in the period from the 1st of December 2020 to 1st of December 2021. Hundred patients were included in the study from both sexes, their ages ranged from 24 to 57year whom diagnosed with renal stone. All samples analyzed qualitatively by standard methods. The study showed that renal stones were more in males (80%) than females (20%) with male to female ratio of 4:1 with higher occurrence at the age of 50-57years. The commonest type was the calcium salts (oxalate and non-oxalate). Finally, the researcher concludes that the urinary stones are a common disease in west of Iraq with higher incidence in men than women. The commonest age of occurrence is 50-57 years and the commonest type is calcium oxalate.

Keywords---urinary stones, chemical composition, Calcium oxalate, urate.

Introduction

Urinary stones are one of the commonest diseases of the urinary system and can have a serious effect on health a life of whole world.(1,2,3) Urinary stones incidence increased in the last years with about 10% or more of the Americans having this disease.(4) Stones can occur in the kidney, ureter and bladder and result in destruction to the kidneys, obstruction to urine flow, and disturbance in kidney function leading to renal failure finally.(5n)Recurrent and new cases incidence is increasing. So that we need a new modality of treatment and prevention which can lead to reduction in the economic burden and can reduce morbidity from that disease. (2)

Many factors that have important role in prevalence and constitution of these stones in various parts of the world including the hereditary factors, place of living and the socioeconomic aspect. In the past Many researchers found a high prevalence and certain types of these stones in developing countries. (6n) They can happen because of urine saturation of the substances that cause stone formation. (3,7) Hormonal factors, diet habits, low water intake which lead to concentration of urine, infections, age, gender, decrease mobility, kidney or bladder obstruction and increase excretion of substances that enter stone composition also led to urinary stones. (7)The relation between urinary tract infection and the urinary stones is well proved and commonly seen.(8)

Previously kidney stones were more in men than women (about three times). New tests suggest a decreasing incidence in men. Obesity in women lead to increased risk of urinary stones. (9) In most of countries the most common type is the calcium type which range from 52-91% (10) In the recent years and in developed world, urinary stones are a strong risk factor for chronic renal disorder (11).

New studies suggested the urinary stones prevalence has been increasing in the previous years in developed and developing countries and this is may be due to lifestyle changes like diet habit, decreased physical activities and global warming (12). New research found that gender and age have strong effects on stone chemical composition with young age females have high incidence of hydro apatite type stones while old females have more uric acid stones (13)

Materials and Methods

A study was done in the period from the 1st of December 2020 to 1st of December 2021. A hundred adults from both sexes between (24-57) years with renal (kidney, ureteral, and bladder stones) were chosen. Informed consent was obtained from all participants. A questionnaire was recorded to each person to collect demographic data and information on congenital anomalies, previous urinary stone, family history of renal stones and dietary habits. Gender, age, and the stone composition of each patient were recorded.

Inclusion criteria:

1. Have urinary stone.
2. Didn't have history of chronic diseases such as diabetes mellitus, congenital anomalies and a family history of renal stones.
3. The age between 24 to 57 years.

Results

Table 1
Distribution of Urinary Stone According to Gender and Age

Males	Females	Age
8	2	24-30
14	4	32-36
25	6	39-44

33	8	50-57
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Table 2
The Chemical composition of Urinary Stone

Type of the stone	Number of the stones	Percentage
Calcium oxalate	44	
Calcium phosphate	26	
Calcium oxalate phosphate	20	
Phosphate	7	
Urate	3	

Discussion

The current study found that the high occurrence of renal stones in patients aged from 50 to 57 years. Another study performed by Afaj and Sultan (2005), showed the highest percentage of the cases was in the 15–50 age group (6). This is may be due to difference in population and regions of the two studies.

A review showed a decrease prevalence of urinary stones in elderly, this may be due to variations in methods sampling or because people having stone may die in a young age. The second opinion could be due to relation between urinary stones and risky medical conditions like hypertension, cardiovascular diseases, diabetes mellitus and obesity. (14) Zainab Ali kadhun, Muslim kandel Found a high incidence in age from 30 to 50 year (7). High water administration gives a cheap way to corrects dehydration and it decreases urinary stones recurrence but information on water mineral composition on stone formation is few. The hardness and alkalinity of water is dependent on magnesium and calcium concentrations and have been negatively and positively related to urinary stones. (9).

The current study results showed that that male develop more renal stones than female, The incidence of stones was more in males (80%)than females (20%) with male to female ratio of 4:1.This could be due to differences in the anatomy urinary system of males and females because the urethra is more long in male than female lead to accumulation and stagnation of urine in the bladder for longer time(5).

This result is similar to other studies which indicate that renal stones occur more in males, Afaj and Sultan, in this study the ratio of male to female was 4:1. (6) Fakhria Jaber Muhbes, showed that male patients more affected by renal stone(68%) and female (32%) but this study performed in another city in Iraq.(5)D.S. Qaader et al. found Male to female ratio was 2.5:1.(2) In another study by Zainab Ali kadhun, Muslim kandel, showed that the prevalence of stones was more in males (65.91%) than females (34.09%) and the male to female ratio of 1.93:1.(7)

In this study, the chemical analysis of the stones showed that calcium oxalate stones were the mostly found type. In a study performed by D.S. Qaader et al. , Stones were mostly mixed type and calcium oxalate was the common type.(3) Weaam Awad Kadhim(2015), found that uric acid stones has the highest rate of incidence (52.9%) in both sexes (70.31 % of males and 29.69 % of females) but this study performed in the west of Iraq but in another city.(2) In a study performed by Kavanagh he noticed that the renal stones mostly consist of calcium oxalate that may be due to high urine content of oxalate.(14) Zainab Ali kadhum, Muslim kandel, found that all the renal stones were of mixed type. The stones composed mostly of calcium salts, uric acid and ammonium 42 (95.46%). (7)

The relation between calcium intake from food is well known with low intake of calcium result in high risk of urinary stones, and decreased risk if calcium taken moderately (9) Food composed from low protein, normal calcium and low sodium results in reduction of urinary stone recurrence (15) In elderly peoples, the metabolism of dietary minerals like calcium may be changed, so the relation between urinary stones and food could be different. (16)

Conclusion

The incidence of the renal stones in west of Iraq is high and still increasing. They occur in old age more than young and males more liable than the females. Changing diet type, high water intake and life style may lead to decrease incidence.

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