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THE ROLE OF DIETARY REGIME AND DRUG THERAPY IN PREVENTION OF RECURRENT UROLITHIASIS

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Summary

Recurrent urolithiasis after surgery is considered as one of the global problems in surgery. Our aim is to see the benefit of high water intake, different diet regimes and drug treatment in the prevention of this problem. A prospective study of 3 years duration (1993-1995) was carried out in Sulaimania Teaching Hospital, surgical ward, including 100 patients having urolithiasis. Only triphosphate stones (56%) and calcium oxalate stones (44%) were found in our patients. Twenty percent had recurrent stones before, 32% had associated predisposing features, mainly UTI. Only 5% developed recurrence despite all measures of prevention, probably due to ignorance of the preventive measures beside working in hot whether and associated UTI. In conclusion, high water intake, diet and drug therapy can be an effective method for prevention of recurrent urolitiasis.

Introduction

Recurrent urolithiasis after surgery considered as one of the global problems, which constitute the vital part of the management. Recurrence is as high as 50% within a year in some series[1] studies have shown that single stone formers have the same incidence and severity of metabolic derangements as patients with recurrent stone disease[1].

The need for repeated stone removal may be dramatically reduced by prophylactic diet and medical program.

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The main types of stones were as follows:

Calcium oxalate stone (80-85%) of all urinary stones.

Triple phosphate stone 10% or less, usually it is secondary to urinary tract infection.

Uric acid stone (5-10%).

Cystic stone (1%).

Different diets and drugs are adapted to every type of stone. In general, increase in fluid intake to maintain urine production in the range of 2500-3000ml/day is essential [1,3,5,6,7].

Our aim is to see the benefit of different diet regimes and drug treatment prevention of recurrent urolithiasis.

Patients and Methods

This is a prospective study conducted from December 1993 till December 1996 in Sulaimania Teaching Hospital, Department of Surgery. One hundred patients were included in our study of different age, sex, occupation and residency with different types of urinary tract stones.

Analysis of the stones were done and also full investigations including general urine analysis, urine calcium level, total serum protein, serum uric acid, ultrasonography of the abdomen, KUB and IVU.

The diet regimens and the proposed medical treatment which was adopted for each stone type is shown in Table I. In general, increase fluid to maintain urine output in the range of 2800-3000ml/day.

Type of stones	Fluid intake	Food restrictions	Drugs
1.Ca. oxalate	↑	Not to take diary products, unless with oxalate containing foods like: spinach, tomato, lemon, etc and vise versa	Thiazid VB6 monthly
2.Tripho sphate	↑	-	Antibiotics Acidification of the urine
3.Cystin	↑	-	D-pencillamin Soluble alkaline K+ Citrate orally
4.Uric acid	↑	Avoid red meat, tea and coffee	Alkalization of the urine allupurinol

Table I. Different diets and drugs in prevention of recurrence of the stone.

The water content of calcium in different areas of Sulaimania City and governorate is recorded.

Patients were followed up with a range of (1-4) years for stone recurrence and identification of risk factors causing recurrence.

Results

Our patients were of different age groups as shown in (Figure 1).

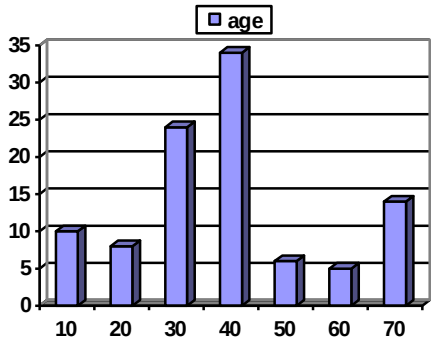
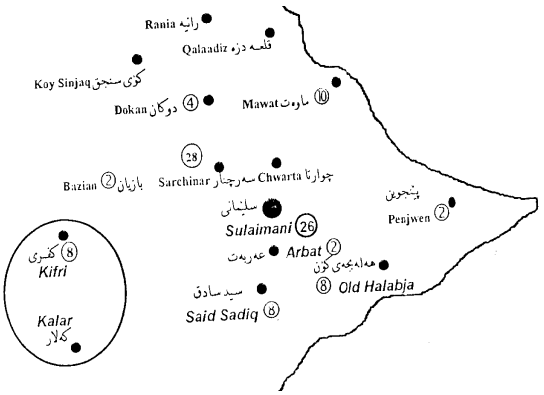


Figure 1. Different age groups of the patients with urolithiasis

They came from different areas within the governorate of Sulaimania (see the map). The patients were divided into two main groups according to the type of stone after analysis;

Triphosphate stone (56%)
Calcium oxalate stone (44%)



Uric acid and cystic stones were not found, see Table II. One fifth of our patients (20%) had history of recurrent urolithiasis before starting the study.

Thirty two patients (32%) has associated predisposing factors, the commonest one was urinary tract infection (16%), followed by hypercalcemia (8%) as shown in Table III.

Type of stones	%
Triphosphate	56
Calcium oxalate	44
Uric acid	0
Cystine	0

Table II. Percentage of the different types of stones.

Associated conditions	%
UTI	16
Hypercalcaemia	08
Stricture	04
BPH	02
Horseshoe kidneys	02

Table III. Predisposing factors for urine stasis.

Family history of urolithiasis is present in 32% of cases. Thirty two patients (32%) had passed stones, between (3-8)mm in diameter, most of them were of triphosphate type as shown in Table IV.

Only 5 patients (5%) developed recurrence despite all measures of prevention. Details of patients with recurrence regarding age, site and type of stone, period of recurrence, calcium content of drinking water and the proposed cause of recurrence as shown in Table V.

No. of patients passing stones	No. of patients with calcium oxalate stone	%	No. of patients with triphosphate stone	%
32	14	43%	18	57%

Table IV. Number and percentage of passing of different stones.

Sex	Age in years	Occupation	Site of stones	Types of stones	Period of recurrence	Calcium of drinking water	Cause of recurrence
Female	36	Housewife	Renal pelvis	Calcium oxalate	2 years	46.6 PPM 2.32 meq/L	Omitting diet and drug recurrent UTI
Female	25	Housewife	Renal pelvis	Calcium oxalate	Several months	46.6PPM 2.32meq/L	Omitting diet and drug recurrent UTI
Male	26	Retired officer	Renal pelvis	Calcium oxalate	7 months	50 PPM 2.5meq/L	Hard physical exercise in hot weather
Male	28	Farmer	Renal pelvis	Calcium oxalate	1 year	76PPM 3.8meq/L	Working in hot, dry weather
Female	6	Housewife	Renal pelvis	Triphosphate	1 year	50 PPM 2.5meq/L	Severe uncontrollable UTI

Table V. Details of patients with recurrence.

Discussion

For successful preventive measures of urinary calculi, specific risk factor and stone composition must be identified in every patient[2].

Increase fluid intake, specific diet and drug regimen are helpful in the prevention[1,3,5,6,7], with resultant reemission rate of greater than 30% and over all reduction in individual stone formation rate of greater than 90% can be obtained[1].

Five patients (5%) developed recurrence, their details shown in Table V, which is lower than the incidence in other studies in which recurrence rate ranging between (40-50%) without drug regimen in 5 years[8].

All the recurrences occurred early postoperatively, and all of them except one were of calcium oxalate type.

The main causes of recurrence were ignorance of high water intake, diet restriction, stopping drug therapy and neglection of urinary tract infection, although one patient was strict to diet and drug regimen but he was working hardly in hot, dry weather (Table III). Our study showed that the calcium content of the drinking water is not related to the recurrence of the stones, the highest calcium content was found in Kitri (148 PPM, 9.39 meq/L) and Said Sadiq (100PPM, 5meq/L) but no patient with recurrence reported from these places. All the patients had recurrences came from areas where calcium content of drinking water is much lower (Table VI).

Area	Amount of calcium in water		Meq/L	No. of patients
	PPM	Part per million		
Sulemani City				
Water project of:				
Aziz aga		76	3.80	06
Hagi bag		67	3.35	00
Girdi jow		50	2.50	14
New dokan		46.6	2.32	04
Serchinar		44.5	2.22	28
Sulemani governorate				
Kefri		1.87	9.39	08
Saidsadiq		100	5	08
Penjwen		89	4.45	02
Arbat		73.6	3.65	02
Old halabja		68	3.40	08
Mawat		66	3.3	10
Rania		65.6	3.25	10
Bazian		57	2.85	02
Dokan		46	1.80	4

From Sulaimania water project archive

Table VI. The amount of calcium in different water project in the area.

In our region triphosphate stone is the commonest type 65% in contrast to South Iraq where it forms only (10-20%)[3]. Male: female ratio is about 1:0.5 while it is 1:2.8 in South Iraq[3].

Triphosphate stones were most frequently passed stones 57% versus 47% for calcium oxalate stones, as the triphosphate stone is the commoner type and because of its smooth surface. In contrast to a study conducted by Jay Gillenwater where more than half of the stones which passed spontaneously were of calcium oxalate[9].

This study showed that urolithiasis is still one of the major health problems all over the world. The diet and drug therapy and increase water intake can be an effective method for prevention of recurrence.

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