Journal of Zankoy Sulaimani
Part-A- (Pure and Applied Sciences)
http://jzs.univsul.edu.iq

Patient's Awareness Regarding Prevention of Recurrent Urinary Tract Stones in Surgical Teaching Hospital in Sulaimani City, Iraq

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Article info

Original: 29 January 2021
Revised: 26 February 2021
Accepted: 2 March 2021
Published online: 20 June 2021

Key Words:
Awareness,
Recurrent urinary tract stones,
Socio-demographic characteristics,

Abstract

Urinary tract stone is the most common recurrent disorder of the urinary tract that encompasses all the process of stone formation in the urinary system (kidney, ureter, bladder, and urethra). Patient's awareness could prevent the disease and its consequences. The aim of this study is to assess the patient's awareness regarding prevention of recurrent urinary tract stones.

A quantitative, descriptive study was carried out in Surgical Teaching Hospital in Sulaimani City, from June to September 2020. A total number of, 50 patients who had urinary stones were recruited into the study, and required data were collected through direct interviews. The questionnaire was used to collect data on the patients' Sociodemographic and awareness of the urinary tract stones. Questions about awareness of urinary stones were related to fluid and beverage intake, past medical history and risk factors, movement and physical activity, and dietary intake. The collected data were analyzed through Statistical Package for the Social Sciences (version 22.0).

The results of the present study showed that most of the patients' aged30 to 60 years, were males (58%), and had primary level of education (38%). Patient's awareness regarding "fluid and beverage intake, past medical history and risk factor, physical activity and dietary intake" was considerably at a moderate level. There was no significant relationship between the patients' socio-demographics and their awareness of the urinary tract stones

It was concluded that the patients were not sufficiently aware of urinary tract stone prevention. Patient's socio-demographic variables did not determine the patients' awareness of stone prevention.

Introduction

Urinary stone is a common disease with an increasing incidence and prevalence worldwide [1]. Kidney stones occur in 5% of people during their lifelong period, affecting about 3-5% of the total population [2]. Urinary tract stone is the process in which stones form in the kidney, bladder, and/or urethra (urinary tract), leading to hematuria, pain in the abdomen, flank or groin, and nausea and vomiting [3].

Urinary stones are one of the most common urological diseases which are highly affected by socio-demographic characteristics, such as age and gender. Incidence of renal stones are up to 10% in 30 to 60 years of age, and the prevalence of urinary stones in the Arabian Gulf countries is around 20% for men at the age of 60 years [4]. The probability of developing urinary stone disease is about 10 to 15 percent in urban areas, this percentage increases up to 20 to 25 percent in the eastern countries [5]. Furthermore, about 50% patients with urinary stones have been more likely to experience recurrent urinary stone formation [6]. The rate of stone formation recurrence is about 70% after a period of 20 years, and 50% after 5 years [7]. Gender also affects the rate of recurrence, such that the rate is about 70-80% in men and 47-60% in women [8].

Urinary stones associated with repeated medical symptoms, and they are a potential cause of structural harm for the renal and the urinary system [9]. The stones that mostly form in the pelvis and in the kidney are

of small size due to low urine volume or high excretion of stone components such as calcium, oxalate, cysteine, xanthine, and phosphate [10].

Urinary stones are one of the most common consequences of contemporary lifestyle, and many factors are involved in their formation [11]. The development and composition of stones are significantly influenced by diet, lifestyle, and comorbidities [12]. Factors predisposing to kidney stones include a recent reduction in fluid intake, increased exercise with dehydration, medications that cause hyperuricemia (high uric acid), and a history of gout. Treatment includes the relief of pain through medicine and antibiotics, hydration, and concurrent urinary infection [13]. Urinary stone is an increasing disease due to the changes in nutritional behavior and the general lifestyle. Furthermore, patients mostly need medical treatment and invasive urological procedures which have numerous adverse effects [14]. Moreover, both inherent and environmental factors assist the formation of urinary stones [15]. Urinary stones can only appear when the urine supersaturated with the stone-forming substances than can be dissolved in urine [16]. Stones are more widespread in individuals whose intake is rich animal protein diet or who do not drink sufficient fluid or have high calcium diet. The greater risk of urinary stone formation includes dryness in a high-temperature environment joined with diet 50% less in calcium and 25% elevated in oxalates in comparison with Western diets, computations for the elevation possible risk in the East [17]. Further accurate information concerning stone formation risk factors may prevent urinary stones among vulnerable groups [18]. Individuals with urinary stone disease should be instructed to adjust the number of lifestyle events which will assist to inhibit or interrupt the urolithiasis repetition [19].

Objectives of the Study

The present study aimed to assess the level of patients' awareness regarding prevention of recurrent urinary tract stones and to identify the relationship between their awareness and some of their variables including age, gender, and level of education.

Methodology

A descriptive quantitative study was carried out in Teaching hospital from June to September 2020. Study sample was non-probability (purposive sample). A total of 50 urolithiasis patients who were admitted in Extra Corporal Shock Wave Lithotripsy (ESWL) department were recruited in to this study. Exclusion criteria were patients who were not admitted to the hospital and those who were younger than 18years.

Instruments and measurement

Data collected was performed using semi-constructed questionnaire which consisted of two parts; the first part had 11 items aimed to gather sociodemographic data, and the second part was related to patient's awareness of urolithiasis stones. The questionnaire was completed using direct interview technique.

The scale was consisted of 4 subscales and 37 questions; 14 items on awareness of fluid and beverage intake, 7 on past history and risk factors, 44 on movement and physical activities, and 12 on dietary intake. The scoring of the scale was based on a 3-point Likert scale (Yes, No, I don't know). We modified the scale to true and false answers, such that for each question, true answer was scored 1, and false and I don't know were scored 0. Thus, for each patient, a score between 0 and 37 was computed. Patient's awareness was scored based on the number of true answers. High score in this scale indicated more awareness of renal stones. For data analysis, mean score was computed. The reliability of the scale was tested using Cranach's alpha which was 88%.

Data analysis

The collected data were analyzed using Statistical Package of Social Sciences (SPSS) version 22.0 through descriptive and inferential statistical analyses. Normal distribution of the data was tested using the standard errors. Statistical significance was considered at P value < 0.05. ANOVA test was used to find the relationship between sociodemographic characteristics and awareness of renal stones.

Results

Table (1). Distribution of study sample according to Sociodemographic data.

Sociodemographic characteristics	Frequency	Percentage
Age		
Less than 30 years	9	18.0
30-60 years	35	70.0
More than 60 years	6	12.0
Gender		
Female	21	42.0
Male	29	58.0
Marital status		
Married	44	88.0
Single	6	12.0
Level of education		
Illiterate	14	28.0
Primary and secondary	23	46.0
Graduate	13	26.0
Occupation status		
Unemployed	32	64.0
Employed	18	36.0
Resident area		
Urban	25	50.0
Suburban	21	42.0
Rural	4	8.0
Economic status		
Sufficient	13	26.0
Barely sufficient	30	60.0
Insufficient	7	14.0
Total	50	100.0

Table 1 demonstrates that most of the study sample (70%) were 30-60 years old, 58% of them were male, 88% were married, 38% were primary graduated, 64% were unemployed, 50% lived in urban areas, and 60% had a barely sufficient economic status.

Table (2). Distribution of study sample according to medical background of the participant.

Medical variables	Frequency	Percentage
Recurrent urolithiasis		
First time	18	36.0
Second time	9	18.0
Third time	23	46.0
Family history		
Yes	29	58.0
No	21	42.0
BMI		
Underweight	7	14.0
Normal	19	38.0
Overweight	22	44.0
Obese	2	4.0

Table 2 shows that the highest percentage of recurrent urinary stone was 46% for the third time, 36% of them had recurrent urinary stone for the first time, and 18% of them for the second time. Moreover, 58% of

the study sample had a family history with urinary stone, while 42% of them did not have a family history with urinary stone. The highest percentages of sample study were overweight 44%, 38% were normal, 14% were underweight, and 4% were obese.

Table (3). Association between Sociodemographic and total level of awareness.

Sociodemographic variables	Mean	SD	F	p.value
Age				
Less than 30 years	52.3	9.7	1.24	0.31
30-60 years	57.3	15.7		
More than 60 years	47.3	21.7		
Gender				
Female	21.47	7.52	1.20	0.27
Male	19.65	4.15		
Marital status				
Married	20.70	6.10	0.87	0.35
Single	18.33	1.96		
Level of education				
Illiterate	21.57	8.57	0.39	0.67
Primary and secondary	19.82	4.36		
Graduate	20.23	4.58		
Occupation status				
Unemployed	19.78	6.19	1.07	0.30
Employed	21.55	5.01		
Resident area				
Urban	19.80	6.32	0.73	0.48
Suburban	21.52	5.55		
Rural	18.50	3.00		
Economic status				
Sufficient	21.7	6.45	0.47	0.62
Barely sufficient	20.00	5.83		
Insufficient	19.71	4.71		

Table 3 shows that there is no significant statistical difference between total level of awareness and all items of Sociodemographic data including age, gender, marital status, level of education, occupation, residential area, and economic status $p>0.05$.

Table (4). Association between medical background and total level of awareness.

Variables	mean	SD	F	p. value
Recurrent urolithiasis				
First time	18.50	6.37	1.90	0.16
Second time	22.77	4.91		
Third time	21.00	5.41		
Family history				
Yes	20.68	5.72	0.14	0.70
No	20.04	6.05		
BMI				
Underweight	17.28	6.87	0.98	0.40
Normal	20.77	5.63		
Overweight	20.78	5.70		
Obese	24.00	4.24		

Table 4 shows that there was no significant association between medical background, such as recurrent urolithiasis and BMI and the overall awareness of kidney stone (p-value= 0.1).

Table (5). The frequency of true answer regarding to the items of awareness regarding kidney stone.

Items		**True answer**	**Percentage**
No	Awareness regarding fluid and beverage intake		
1	Drink plenty of fluid in hot weather and intense sweating and doing great work or while doing exercise.	44	88.0
2	The use of ventilation and replace lost fluids if the business for a long time in hot areas such as kitchen and oven.	42	84.0
3	Drinking a large amount of fluid in case of fever and severe diarrhea.	33	66.0
4	Drink water before going to sleep or when the advancement of the night and when you wake up in the morning by one or two cups.	43	86.0
5	Taking adequate amounts of fluids during and between meals.	42	84.0
6	Decrease drinking soft drinks such as Pepsi or Coca-Cola.	43	86.0
7	Decrease stimulants drinking such as tea, coffee and cocoa.	31	62.0
8	Increase juices intake like orange juice, lemon juice citrus	34	68.0
9	Cranberry juice intake which prevents bacteria causing urinary tract infection	29	58.0
10	Avoid drinking alcohol.	41	82.0
11	Don't drink water from unhealthy resources such as rivers, wells, and ponds.	38	76.0
12	Check the amount of urine output which must not be less than (2.5) liter/24 hours.	34	68.0
13	Start urination as soon as feeling that and do not lock up the urine for a long time in the bladder, it helps to build-up and accumulation of mineral salts in all parts of the urinary system	46	92.0
14	24 hours urine collection after removing stones to detect the urine volume, PH, calcium, oxalate, uric acid.	5	10.0
No	Do you know that following condition may cause urinary tract stone (past history and risk factors)		
1	Hyperparathyroidism	3	6.0
2	Gout	13	26.0
3	Recurrent urinary tract infections	30	60.0
4	Chronic dehydration	28	56.0
5	Prolonged catheterization	13	26.0
6	Hypertension	11	22.0
7	Diabetes	7	14.0
No	Do you know that following condition may cause urinary tract stone movement and physical activities?		
1	Prolonged immobility in the bed in case of fractures and heart diseases	24	48.0
2	Sleeping on one side without changing position	19	38.0
3	Prolonged sitting without movement	27	54.0
4	Lack of exercises	32	64.0
No	Awareness regarding dietary intake		

1	Reducing the intake of animal protein-rich foods such as red meat (beef, sheep meat)	41	82.0
2	Decrease white meat intake such as chicken and fish	28	56.0
3	Eat limited amounts of foods rich in vegetable protein (beans, Homs, lentils).	37	74.0
4	Intake little amounts of milk and dairy products	25	50.0
5	Avoid eating food rich in calcium (yogurt, dried figs, salmon, okra, chickpeas, milk, and dairy products).	28	56.0
6	Decrease eating oxalate rich diet such as (Sudan beans, wheat. almonds, hazelnuts, soy, spinach, chocolate, potatoes, and chick peas).	16	32.0
7	Avoid eating refined sugars that stimulate the secretion of insulin. This in turn leads to put large amounts of calcium in the urine.	18	36.0
8	Increased intake of foods rich with vitamin (A) Kalmhamsh peach and pumpkin Aldzro.	11	22.0
9	Avoid increased intake of fresh fruit and vegetables or juices (when the case is genetic stones) because it raises the acidity of urine and thus help to form cystine stones.	20	40.0
10	Reduce the intake of table salt. Increased sodium intake increases the risk of formation of gravel by increasing the levels of calcium and reducing the level of citrate in the urine.	44	88.0
11	Avoid excessive intake of calcium and vitamin "D" tablets, especially after the age of menopause	14	28.0
12	Avoid eating fatty substances or cooked in fat	27	54.0

Table 5 shows that the awareness regarding fluid and beverage intake was considerably good among the patients, the percentage of true answer of the awareness items among the patients was from 58% to 92%, in inception to the items 14 which is related to preparation of urine to detect PH and kind of stone. Awareness regarding health condition, medical background causes to renal stone was less among the patients except for recurrent urinary tract infection (60%) and chronic dehydration (56%). Awareness regarding movement and physical activities was considerably moderate. The percentage of awareness regarding dietary intake was highly different, the rate of true answer lies between (22%) and (88%) among the patients.

Discussion

The aim of the current study was to know the patient's awareness regarding renal stones and find out the sociodemographic determinants. The results of this study demonstrated that the urolithiasis patients' awareness regarding kidney stone was at a moderate level. Concerning the sociodemographic characteristics, the current study found that most of the patients were 30 to 60 years old, which is mostly related to the high prevalence of urolithiasis in the aging population [20]. More than two-thirds of the urolithiasis patients in this study were males. Similar findings were observed in another study [21].

The current study demonstrated that almost half of the patients had primary and secondary education level. The patients' level of education was found to play an important role as the main risk factor for the increased prevalence of recurrent urinary stones and preventive measures for stone formation. However, the current study did find a significant relationship between the level of education and awareness of urolithiasis. In this regard, a study in Egypt found that the majority of the urolithiasis patients were educated and worked in groups [22]. Similarly, a similar result was found for around half of the study sample who resided rural areas; however, high population of Sulaimani province reside the city. Another study demonstrated that the majority of the urolithiasis patients lived in rural areas [23].

The frequency of recurrent urinary tract stones also varies in different studies. In the current study, about 46% of the sample had a three-time recurrence. Another study indicated that recurrent rate was 50% within 5–10 years and 75% within 20 years [24]. The present study illustrated that nearly half of the patients had a history of recurrent urinary stone for 3 times, which is mainly related to recurrent urinary tract infection. A study in Baghdad proved the relationship between urinary tract infection and recurrent stones in the urinary bladder [25]. Furthermore, a study showed association between bacterial infection and urinary stone disease [26]. Regarding body mass index, the results of this study revealed that 44% of the samples were at a critical bound of overweight status. Individuals with central adiposity or high waist-to-hip ratios have a high risk of urolithiasis [27].

Awareness regarding urinary stones among the patients was found to play a crucial role in the occurrence of urolithiasis. Health education program played a significant role in decreasing the prevalence of urinary stone among extracorporeal shock waves lithotripsy patients [28]. However, comorbidities such as hypertension, cardiovascular diseases, and stroke have also a relatively strong association with kidney stones [29]. As mentioned above, the patients in this study had an almost moderate level of awareness regarding kidney stones. Meanwhile the patients' awareness of fluid and beverage intake was considerably good, while the patients' awareness regarding renal stones and medical condition causing renal stone was low; however, most of the patients stated that recurrent urinary tract infection and chronic dehydration were the main causes for renal stones. Similarly, the patients' awareness of dietary intake was quite varying.

As shown by the results of previous studies, high fluid intake leads to prevention of urinary stones and recurrent urinary stones [30][31][32]. Similarly, another study in Saudi Arabia mentioned that knowledge about and attitudes towards the recommendation of high fluid intake could decrease the recurrence of urinary stones [33] [34]. Other addressed risk factors for urinary stones include type 2 diabetic mellitus and decreased pH in urine, long dryness, and great physical effort [35][36]. Some people still have poor awareness regarding the relationship between urinary stone and movement and physical activities [37].

Conclusion

The study concludes that urinary stones were more common in males than females, and most patients did not have a sufficient awareness regarding urinary stone prevention. The patients' sociodemographic variables did not determine the patients' awareness regarding urinary stone prevention.

Recommendations

The study recommends that a continuous educational program should be planned and offered on a regular basis for patients with urinary stones within the urology departments and outpatient clinics.

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