Effectiveness of Dietary Habits on Urolithiatic Patients at Urinary Units in Baghdad Teaching Hospitals

تأثير العادات التغذوية على مرضى حصى المسالك البولية في الوحدات البولية في مستشفيات بغداد التعليمية

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المستخلص:

الهدف: هدفت الدراسة لإيجاد تأثير العادات التغذوية في تكوين حصى المسالك البولية لمرضى الوحدات البولية في مستشفيات بغداد التعليمية
المنهجية: دراسة وصفية كمّية أجريت لمعرفة مدى تأثير العادات التغذوية على (١٠٠) مريض بحصى المسالك البولية في الوحدات البولية لمستشفيات بغداد التعليمية. بدأت من مايس ٢٠١١ إلى أيلول ٢٠١٢.
جمعت البيانات أبان إستعمال قائمة بنيت على تدقيق صيغة الإستفتاء، التي شملت جزئين: - الجزء الأول: يتعلّق بمتغيّرات المريض الديموغرافية ، الجزء الثاني: يبين تأثير العادات التغذوية. العدد الكليّ لفقرات الإستفتاء كان (٦٩) فقرة. قرّرت صلاحية صيغة الإستفتاء بلجنة تتألف من (٢٣) خبيراً. وحُددت الثقة خلال دراسة أولية. تمت إجراءات التحليل الإحصائية الوصفية (التردد و النسبة المئوية) لتحليل البيانات في هذه الدراسة.
النتائج: بينت الدراسة أن تكوين حصى المسالك البولية تتأثر بالسلوكيات (العادات) التغذوية التالية: { تتحفز بقلي الطعام وتناول المشروبات الغازية الحاوية على حامض الفسفوريك (الكوكا والبيبسي كولا) والشاي واللحم الأحمر والبيض والكريم المجمد (الأيس كريم) والطماطم والبطاطه والفلفل والتهاب المجاري البولية والسمنة والمناخ الحار وقلة الوعي، بينما تُكبح بتناول الماء والقهوة والكاكاو والعنب والمشمش (الطازج والعصيروالحلوى) والسوائل الغازية (السفن أب والميراندا) والأعشاب والحليب ومنتجاتهُ(الجبن والزبد) واللحم الأبيض (الدجاج والسمك) والفيتامينات }. يستنتج من هذا أن هناك تأثيراً واضحاً "للعادات الغذائية" على تكوين حصى المسالك البولية.
التوصيات: اوصت الدراسة بضرورة اعداد و تصميم برنامج خاص بصورة كتيبات أو قصاصات يدوي للمرضى تتضمّن (نوع الحصى البولية التي أصابته، وفقا لذلك يجب أن ينصح بتعليم لمعرفة العادات الغذائية يمتنع عن بعضها ويكثر في تناول الآخرى لتجنّب تكرارتكون الحصى، شرب السوائل خصوصا الماء ٣-٤ لتر يوميا، عدم تأخر التدرر، وأضافة الحليب إلى الشاي لتقليل احتمالية تشكيل الحصى بسبب محتوى الشاي من الاوكزاليت).

Abstract:

Objectives: The study aims at finding the effectiveness of dietary habits on urolithiatic patients at Urinary Units in Baghdad Teaching Hospitals.
Methodology: A quantitative descriptive study was conducted to identify the effectiveness of dietary habits on (100) of urolithiatic patients in Urinary Units at Baghdad Teaching Hospitals starting from May 2011 to Sep. 2012.Data were collected through the use of constructed check list of the questionnaire format, which consists of two parts: - The first part: is related to the patient's demographic variables ; the second part: is constructed to serve the purpose of the study (effectiveness of the dietary habits). The total number of items of the questionnaire is (69) items. Validity of the questionnaire format was determined through a panel of (23) experts and the reliability is determined through a pilot study. Descriptive statistical analysis procedures (the frequency, and the percentage) is used for the data analysis of this study.
Results: The data of this study shows that the urinary tract system (UTS) stone formation (SF) is: {Activated (increased) by fried foods, soft drinks (Pepsi cola and Coca cola), tea, red meat, eggs, ice cream, tomato, potato, pepper, urinary tract infection (UTI), obesity, hot areas, low education; and, Inhibited (decreased) by water, coffee, cacao, natural raisin and apricot (fresh, syrup, dry), Artificial beverage (Seven up, Miranda), herbs, milk, cheese and butter, white meat (chicken, fish), vitamins}. So, it would be concluded that there is a clear effect of ''dietary habit'' on urinary stone formation.
Recommendations: The study recommended that the patients should be given booklets or manual guides including the following (Type of his/her urinary stone. Accordingly should be advised to: Reduction of his/her dietary habit by preventing certain materials and increasing others to avoid stone recurrence; Advised to drink liquids especially water 3-4 l/day, Never delay urine voiding, and add the Milk to tea to decrease tea's promotion to stone formation because the tea is high content of oxalate).
Keywords: Effectiveness, Dietary Habits, Urolithiasis, Patient

Introduction:

In ancient centuries urolithiasis was often a disastrous disease, with a catastrophic outcome all too often Leading to the patient's death. [1]

Examinations of the Egyptian mummies have revealed kidney and bladder stone disease. For example, in 1901, the English archaeologist E. Smith found a 5,000-year-old bladder stone at the funeral site of El-Amrah, Egypt. [2]

Urolithiasis is a significant source of morbidity, affecting all geographical, cultural, and racial groups. The lifetime risk is about 10-15% in the developed world, but can be as high as 20-25% in the Middle East. The increased risk of dehydration in hot climates, coupled with a diet that is 50% lower in calcium and 250% higher in oxalates compared to Western diets; accounts for the higher net risk in the Middle East. Although one might expect more calcium oxalate stones, uric acid stones are actually more common in the Middle East than calcium-containing stones. [3]

Urolithiasis is a universal problem that has become increasingly prevalent in the United States and has a high rate of recurrence. Imaging of urolithiasis has evolved over the years due to technologic advances and a better understanding of the disease process. Metabolic abnormalities are identified in over 90% of stone formers and the institution of preventative dietary and medical measures has resulted in substantial reduction in stone recurrence rates. We review the contemporary approach to metabolic evaluation of urolithiasis. [4]

Epidemiologic observations leave no doubt that diet plays a major, if not the most important role in the pathogenesis of urolithiasis. Much evidence has been put forward that the consumption of animal protein is closely related to the prevalence of stone disease in a given population. Animal protein intake has a great influence on the whole stone forming risk and the chemical composition of urinary calculi. [5, 6]

Diet plays an important role in the pathogenesis of Urolithiasis. Because the metabolism of many dietary factors, such as calcium, may change with age, and the relation between diet and Urolithiasis may be different in older adults. Uncertainty also remains about the association between many dietary factors, such as vitamin C, magnesium, and animal protein, and the risk of urinary system stone formation. [7]

The role of nursing care for Urolithiatic patients, according to the knowledge of the researcher could be:-

1. Diet should be modified to conform to individual symptoms and tolerances.
2. The patient should be encouraged to eat the prescribed diet to maintain an optimum balance of nutrients and to promote healing.
3. Nursing personnel should note and document what the patient eats. If the patient is unable to tolerate the prescribed diet, the physician may order an alternate form of nutrition therapy.

Methodology:

A quantitative descriptive study was conducted to identify the effectiveness of dietary habits on urolithiatic patients in urinary units at Baghdad Teaching Hospitals which consumed May to September, 2011.

Purposive (Non-Probability) sample of (100) patients (males and females) with Urolithiasis diagnosis who were admitted to the hospitals listed above at the Clinic Consultation of Urology who agreed to this study questionnaire.

A Questionnaire format has been constructed through extensive review of available literatures, related studies and consultation with the specialists in and outside the collage. The questionnaire format consists of three parts:-

The first part: is related to the patient's demographic variables and diseases sign's; the second part: is constructed to serve the purpose of the study (Effectiveness of the Dietary Habits). The total number of the items of the questionnaire is (69) items.

Part 1: A data sheet of sociodemographic characteristics of patients, it consists of (11) items which include: age, gender, marital status, level of education, occupation, work hours, family level, economic income, length and weight (BMI), work place and residential place.

Part 2: Nutritional Habits: This part consists of structural items concerning patient's dietary habits; it consists of (58) items. In relation to fluids include (14) items, diet include are divided to sub domain (40) items, vitamins include (3) items and herbs include (2 for Yes, 1 for No) items. Ingestion of materials was rated as: (monthly = low range; weekly=moderate; daily =much). The researcher obtained this list format from the Institute of the Nutrition's Researcher / Baghdad and these include the nutritional materials which were found in Iraq.

Validity of the instrument was determined through the use of a panel of (23) experts who are related to the study to investigate the content of the questionnaire to clarity and adequacy in order to achieve the objectives of the present study.

A pilot study was conducted on a purposive sample of (10) patients at two Teaching Hospitals, from May to June, 2011.

The data have been collected through the use of a questionnaire and by means of an obtained data from (100) study patients using a constructive questionnaire format that was answered (self-administrative). And Interview technique to the patients with Urolithiasis who visited the in patient in the selected Teaching Hospitals. The interview took a time of about (25) minutes for each patient when he/she is in the Urinary Surgical Ward .The data have been analyzed through the application of statistical procedures and using the package of SPSS version nineteen .

The following statistical procedures were used in this study:-

Descriptive statistical data analysis approach concentrated on the calculation of the relative frequencies and percentage that represent demographic characteristics of Urolithiatic patient's age, gender, marital status, educational level, economic income, occupation and body mass index.

Results:-

Table 1. Demographic Characteristics of Study Patients

list	Demographic Characteristics	Patients%	
1	Gender	Male	69
2	Age (years)	40-49	24
3	Marital status	Married	85
4	Educational level	Primary school graduate	25
5	Occupation	Private business	41
6	Work Hours	8 hrs/day	47
7	Family residence	Alone	54
8	Income	Sufficient	45
9	Body Mass Index	Over normal weight	64
1	Weather at work	Hot	48
1	Address	City	73

%=percent

This table (1) shows that the majority of the sample (69%) were male, most of them (24%) were at age (40-49). And the majority of the sample (85%) were married. Most of the study sample (25%) were primary school graduates, and most of the study sample were employed most of them (41%) were Private Business. work hours of (47%) was at (8) hrs. /day, the percentage of sample (54%) is single family and the income average is (45%) sufficient, (48%) of the study sample exposed to hot environment. The majority of the study sample (73%) lives in Baghdad city. Most of the study sample had overweight, obese and extremely obese .BMI (33%, 30%, 1% respectively) collectively constituting 64% of the patients.

Table 2. Types of Drinks Preferably Consumed by Study Patients

list	Drinks Preferable	Consumption	Patients %
1	Water	Low	99
2 & 3	Coffee and Cacao	Low	91 & 94
4	Tea	High	88
5	Natural Raisin Beverage	Low	62
6	Natural orange Beverage	Low	56
7	Natural apricot Beverage	Low	84
8	Artificial Beverage	Low	57
9	Seven up Beverage	Low	57
10	Miranda Beverage	Low	83
11&12	Pepsi Cola and Pepsi Diet	High	61 & 94
13&14	Beer and Barley Islamic	Low	96 & 82

%=percent

Table (2) indicates that the highest percentage of patients is ''much'' on items (3, 11, and 12) and ''low'' in the remaining items.

Table 3. Types of -*i*- Protein Food Sources Preferably Consumed by Study Patients

list	Protein Food	Consumption	Patients%
1	Red meat	High	50
2	White meat (chicken)	Moderate	56
3	Fish	Moderate	64
4	Eggs	High	73
5	legumes & Pea Products	High	66

%=percent

Table (3) indicates that the percentage of patients is ''much'' on items (1, 4, 5) and ''moderate'' on the items (2, 3).

Table 4. Types of -*ii*- Dairy Products Preferably Consumed by Study Patients

list	Dairy Product's	Consumption	Patients%
1	Yoghurt	Low	68
2	Cheese	Moderate	36
3	Butter	Low	91
4	Cream and Ice Cream	High	36

%=percent

This table (4) indicates that the percentage of patients is ''much'' on item (4), ''moderate'' on the item (2) and ''low'' on the item (1,3).

Table 5. Types of -*iii*- Green Vegetables Preferably Consumed by Study Patients

list	Green Vegetables	Consumption	Patients%
1	Lettuce	High	51
2	Spinach	Low	71
3&4	Swiss chard and Beet	Low	67 & 1
5	Green Onion	High	49
6	Green Vegetables	High	54
7	Tomato	High	83
8	Potato	High	66
9	Pepper	High	44
10	Cauliflower	Low	65
11	Shalgam	High	47
12	Hundir (red)	Low	56
13	Carrot	Low	41

%=percent

Table (5) indicates that the highest percentage of patients is ''much'' on items (1,5,6,7,8,9,11), none at a ''moderate'' levels and ''low'' on the items (2,3,4,10,12,13).

Table 6. Types of -*iv*- Many Different Groups of Foods Preferably Consumed by Study Patients

list	Different Groups of Foods	Consumption	Patients%
1	Nuts (salted)	High	55
2	Salts	High	66
3	Chocolate	Low	56
4	Food with Sesame	Low	81
5	Wheat Bran	Low	95
6	Bread (without bran)	High	99
7	Rice	High	84

%=percent

Table (6) indicates that the highest percentage of patients is ''mach'' on items (1,2,6,7), none at a ''moderate'' level and ''low'' on the items (3,4,5).

Table 7. Types of -*v*- Fruits Preferably Consumed by Study Patients

list	Fruits Preferably	Consumption	Patients%
1	Natural raisin	Low	55
2	Natural Apricot	Low	39
3	Natural Orange	High	62
4	Jammed Apricot	Low	51
5	Dried Apricot	Low	89
6	Dried Raisin	Low	80
7	Dates	Low	48
8	Dried figs	Low	67

%=percent

Table (7) indicates that the highest percentage of patients is high on item (3), none at a ''moderate'' level and ''low'' on the items (1, 2, 4, 5, 6, 7, and 8).

Table 8. Way of Cooking Foods Preferably Consumed in House Kitchen by Study Patients

list	Way of Cooking Foods	Consumption	Patients%
1	Boiled	Low	7
2	Fried	Much	70
3	Roast	Moderate	23

%=percent

Table (8) indicates that the highest percentage of patients is ''much'' on item (2), ''moderate'' on the items (3) and ''low'' on the item (1).

Table 9. Types of vitamins ''Usually'' Taken by Study Patients

list	Vitamins	Consumption	Patients%
1	Vitamin B6	5	5.0
2	Vitamin C	18	18.0
3	Vitamin D3	4	4.0
4	All vitamins Consumed	10	10.0
5	None of them	62	62.0

%=percent

Table (9) indicates that a ''high'' percentage of patients usually do not use any types of vitamins, ''moderate'' percentage use item (5) and ''low'' usage of individual vitamins items (1,2,3,4).

Table 10. Herbs Taken by Study Patients

list	Herbs	Consumption	Patients%
1	Yes	55	55.0
2	No	45	45.0

%=percent

Table (10) indicates that a considerable percentage (55.0%) of patients usually use herbs.

Discussion:

The presentation is provided with supportive and available evidence in literature and related studies.

Table (1) indicated that the majority of the study subjects were males (69%). This result agrees with similar studies obtained in some developing countries that male – to - female ratio ranges from 1.15:1 in Iran,[8] ; 1.6:1 in Thailand,[9] ; 2.5:1 in Iraq,[10]; to 5:1 in Saudi Arabia,[11]. The finding agrees with [12] who mentioned that the Urolithiasis is common in males. In relation to age the findings showed that the high percent of Urolithiasis patients were at age (40- 49) years. These finding supported by Al-Rubayi and by Al-Kaabee; who mentioned that Urolithiasis are more common in persons with ages (40 and above) years [25, 24]. Concerning marital status, the findings indicated that the majority (85%) of the study 2 sample were married. These findings agreed with the common idea ''the most inflammations leading to infection ''the close partner (husband) the best transmitter for diseases and primarily uro-genetical tract organs is a good route and area for bacterial growth (Dark and moist area), and personal bad hygiene. Related to the level of education, the findings indicated that a good percent (25%) of the study sample were primary school graduates. This reflect that ''the better education the better life''. Regarding hot environment, the findings showed that a good percent (48%) of the study sample were exposed to hot environment. This reflects that hot environment is a risk factor for stone formation. These findings supported by Brawer who stated that projected increasing global temperatures will lead to an increased incidence of urinary stones in coming years [13]. and This finding agrees with Al-Kaabee which stated that hot environment causes more sweating and excessive loss of fluids which increase the probability of dehydration and lead to stone formation [24]. Regarding to occupational status the findings indicated that (62%) of the study sample were governmental employ. Such people are busy to use water circulation. Such obligatory delay from urination would mostly lead to stone formation. This finding agreed and similar to the results of Al-Kaabee who stated that the large frequency of study sample is employed [24]. A 47% of the study sample work (8) hrs. /day, and (45%) of sample study work (16) hrs./day which would have little water drinking and delay voiding. A good percent of the patient (46%) live together as expended the families. Such crowded places decrease the possibility of free access to water circulation. The study refers to sufficient economic income of the sample (45%). This result indicates that this sample lead to an increase weight changing which would lead to stone formation. The Residential area of the present study indicated that (27%) live in country-sides areas. The study can explain this view that there are difficulties in the country-side to reach and follow-up the practitioner instructions, to prevent urolithiasis. The body mass index (BMI) related to findings of this study showed that (33%) + (30%) collectively (63%) of the patients are over weight and obese which both promote urolithiasis. These findings agree with Taylor who said that obesity and weight gain are associated with an increased risk of Urolithiasis [14]. Maalouf believed that obesity is associated with insulin resistance and hyper-insulinemia that may contribute to the development of calcium stones by increasing urinary calcium excretion [28]. Siener showed that higher weight is also associated with a lower urine pH, and a defect in the ability to excrete uric acid that lead to stone formation [15]. The findings concern to family history which shows that (49%) of the study sample had family history of Urolithiasis, The picture could be seen from a window that the effectiveness of the life habits is similar in each family. Al-Kaabee supported this result, he found that people with family history of urinary tract stone at higher risk than those without relatives having stone formation [24]. Siener and Spivacow who do not agree; they said although numerous studies have identified that there is numerous risk factors for urolithiasis, the exact mono cause of stone formation is often unknown [16,17].

Table (2) of the present study shows that the patients after being with Urolithiasis and some with Urolithiasis recurrent, are

urged to follow the practitioner instruction to prevent stone recurrence, drinking a high amount of water for example. Kathleen and Sylvia; who agreed the study, referred to intake of 250 ml of fluid at each meal, between meals, at bedtime, and when arising to void during night. Half of these daily (2.5–3) liters should be taken as water or liquid to compensate fluid loss from the body [26]. The human body contains large amount of fluids (nearly 3/4 of body weight) so should know how collocate the fluid intake and out put and replace the deficiency through the entire 24 hour period, to obtain a healthy life.

Also (91%) of the study sample drink coffee. Lingeman who agree this result said that coffee is associated with reduce risk of stone formation [18]. So that the intake of coffee would reduce the stone formation in our people sample which is a considerable finding. And that (88%) of the study sample is considered as high tea drinker. Taylor agreed this study; Borghi also agreed, they said; that tea has an effect to produce Urolithiasis and its recurrence [14, 19]. Kessler observed that there is a high oxalate content in the tea; while when it is taken with milk it does not seem to increase stone formation [27]. Meanwhile (94%) of the study sample are low cacao drinkers. Taylor agreed this study who said, in a large cohort studies that the consumption of cacao is associated with reduced risk of stone formation [14]. Never the less (62%) of the study sample are low natural raisin beverage drinkers. Heilberg agreed this study result, who said; that low grape juice drinking (only 300 ml per day) increased the risk of stone formation [34]. Which indicates that increase drinking of this fruit reduces the risk of stone formation?

In this research (56%) of the study sample are low natural orange beverage drinkers. The orange drinking did not remove the risk of stone formation (SF). Vartanian agree with this study, who said that orange juice increases citrate levels, it does not lower calcium and it raises oxalate levels, i.e., is not recommended [32]. And that (84%) of the study sample are low natural apricot beverage drinkers. This result refers to similarity to the habits of people in the country towards expensive materials. Since (61%, 94%) of the study sample drinking a large quantity of Pepsi Cola and Pepsi Diet respectively. Vartanian agreed this result, who said; that soft drinks which contain phosphoric acid increase the risk for SF, Popkin also agreed with this results who similarity found; that phosphoric acid, which is used to give the dark colas a tangy taste leads to many problems [32, 33]. Determining that study sample are low drinkers of beer and barley (3%, 4%). Our believing in Islamic religion which prohibit such drinks, aids to decrease usage of such drinks by all; though Islamic barley is about 10-15% more acceptable.

Table (3) indicated that (50%, 73% and 66%) of the study sample eating a large quantity of red meat, eggs and plant protein. Johri agree with this result, who said; that urinary citrate excretion is commonly found in those with a high dietary intake of animal protein, whereas vegetarians tend to have higher levels of citrate excretion. So is high intake of protein is dangerous for SF [20].

The finding in Table (4) indicated that (36%) of the study sample utilize large quantities of Ice Cream, though the percent is not high. On the other hand, 68% and 91% of patients consumed ''low'' quantities of milk and butter respectively. Johri and CRDR agreed this study result, who said: high intakes of dietary calcium do not appear to cause UTS stones and may actually protect against their development [20, 21]. This is perhaps related to the role of calcium in binding ingested oxalate in the gastrointestinal tract to exit it out of the human body. Therefore milk and its products prevent SF.

The result in Table (5) shows that many types of vegetables are taken by sample study at variable quantities. Oxalate is known to be a prime constituent of vegetables; which cause exogenous (secondary) hyper oxaluria. Holmes, Assimos and Siener agreed this result who said that much of the oxalate in food may not be readily absorbed. The dietary contribution of urinary oxalate may be a high risk in SF [22, 16]. Hesse mentioned that primary hyperoxaluria is a feature of an autosomal-recessive genetic defect of a hepatic enzyme that results in over production of oxalate and a urinary oxalate concentration [23].

In the present study (55%, 66%) of the study sample consumed ''high'' amount of salted nuts and used salty foods respectively. Spivacow agreed with this study who mentioned that: the risk for Urolithiasis is significantly higher in hypertensive human due to increase salts in daily eating [17]. This amount of sodium in the urine and hyper-calciuria are directly correlated because sodium and calcium are reabsorbed at common sites in the renal tubules, (Table 6).

Table (7) indicated that (62%) of the study sample uses natural orange. Vartanian agreed with this study result, who said that natural orange eating increases citrate levels, it does not lower calcium and it raises oxalate levels [32]. There fore it is not recommended at high quantity.

While Table (8) reviewed that (70%) of the study sample prefer fried food as away of cooking. this concluding that changes in fried fat or oil and different fried food would enhance SF.

Collectively (Table 9) only (38%) of the study sample taken vitamin supplementary, while (62%) do not take any vitamin. These results agreed with Massey and Kaelin them said that vitamin B6 reduces urinary oxalate in some calcium oxalate stone formers [30, 31]. The (18%) percentage of sample used vitamin C supplementary daily. This result agree with those of Johri who said: the excess dietary intake of vitamin C might increase the risk of calcium oxalate stone formation [20]. And coincide with Vartanian about eating orange which increases citrate level which lowers calcium and raises oxalate [32]. The percentage (17%) of sample utilizes all types of vitamin supplementary daily. Vitamins are usually balance the hepatic metabolism, which wouldn't disturb and produce abnormal amo-unts of radicals and salts.

A (55%) of the study sample take all types of herbal supplementary daily (such as: cob of corn); which explained that the patients obeyed physician instructions or public promotions to use herbs to reduce stone size and accelerate stone passage with urine. Terris said: herbal supplementary reduces the risk of UTS stones (table 10) [29].

Recommendations:

1. The patients should be given booklets or manual guides including type of his / her urinary stone accordingly should be advised to reduce dietary habit by preventing certain materials and increase others to avoid stone recurrence. Advised to drink liquids especially water 3-4 l/day. Never delay urine voiding. Milk should be added to tea to decrease tea's promotion to stone formation. Increase education about Stone Formation causes.
2. Use media to educate people to prevent Stone Formation.

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