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Association of Different Risk Factors with the Occurrence of Urinary Tract Infection in Iraq

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ABSTRACT

Background: Urinary Tract Infection (UTI) can happen anywhere in the Urinary system but they are must often cause by bacteria that get into the bladder and it's more common in women.

The aim of the study: is to determine factors, which cause or are associated with the occurrence of UTI in Mosul, Iraq. Methods: A case-control study was conducted in Mosul, Iraq, for two months period December 2020 and January 2021.

Results: A total of 100 Cases of UTI and 100 controls without UTI were screened and enrolled in the study. The significant risk association between UTI and the following risk factors identified: age ⩾ 40 (OR = 6.56), Spicy food (OR =7,11), Citrus (OR=2,19), Calcium supplement (OR = 6.00), family history (OR=2.27), retaining urine (OR = 9.21), constipation (OR=2.75), Poor personal hygiene (OR=4.55).

Conclusion: The main associations of UTI in Iraq were foods (Spicy and citrus), age (old age group), Calcium supplement, family history, Constipation, poor personal hygiene, and retaining urine.

Keywords: Urinary tract infection (UTI), risk factors, calcium supplement, Mosul city.

INTRODUCTION

UTI are estimated to account for over 7 million office visits per year [1, 2]. UTI are among the most common bacterial infections in out Patient clinical settings globally [3]. Over the likelihood of developing UTI is approximately 30 times higher in women than men due to their anatomical peculiarities [4].Up to 40% of women will develop UTI at least once during their lives[1]. Classification of UTI traditionally, UTI are classified based on clinical symptoms and laboratory data. Practically, UTI has been divided into uncomplicated and complicated UTI [2, 5]. Approximately 15% of all Community Prescribed antibiotics in the US are dispended for UTI [6, 7].

There are intrinsic and extrinsic risk factors that are the leading cause of UTI[8]. These risk factors include: Age group, UTI is increased in older adults [9, 10], decrease water intake [4], diabetes [11, 12], birth control: Intrauterine device (IUD) and condom [13, 14]), occupation sitting [15], Constipation [16], family history [17], using catheter [18], retaining urine (hold it in) [19], poor personal hygiene [20], Pregnancy [21], calcium supplement [22], diet like spicy food, citrus, acidic fruits, coffee, cola [23,24].This study aims to determine factors that cause or associate with the occurrence of UTI.

MATERIAL AND METHODS

To achieve the aim of this study, a total of 200 women were enrolled in a case-control study design to compare 100 married women with UTI (cases) with 100 women without UTI (controls) selected according to the method of unpaired sampling from Tammuz Health Center in Mosul, Iraq during two months' period December 2020 and January 2021.

A case-control study design was used. Cases were married women with UTI, controls were married women visit the health center for another disease rather than UTI. Cases diagnosed as UTI patients depending on symptoms of patients. The sample of control was selected according to the method of unpaired sampling [25]. So, for each case of UTI, a control was selected and interviewed.

The questionnaire form includes information about the patient age, pregnancy, food consumption like (spicy food, citrus, acidic fruits, coffee, cola), drinking of water (number of glasses), Calcium supplement, diabetes, birth control (IUD,

condom), family history of UTI, using Catheter, retaining Urine (hold it in), constipation, sitting occupation, personal hygiene.

Data collection was conducted during two months period. All patients have been personally interviewed by the researcher and the main source of data was obtained by filling in the questionnaire form directly from Cases and controls.

Odds Ratios (OR) and 95% Confidence Intervals (CI) for the OR were calculated. The P-value calculated using the x2 test, a P-value > 0.05 was not significant (NS).

RESULTS

The study sample was grouped into four age strata; this is shown in table (1).

Table 1: Association of age with UIT

Age groups	Cases N= 100 N	%	Controls N= 100 N	%	OR	95% CI	P value
≤ 19	8	44.44	10	55.56	0.78	0.74 - 0.82	NS
20 – 29	22	41.51	31	58.49	1.98	1.92 – 2.04	NS
30 – 39	11	21.15	41	78.85	0.18	0.12 – 0.24	0.001
≥ 40	59	76.62	18	23.38	6.56	6.49 – 6.63	0.001
All ages	100		100				

for the age group (20-29) there is an association of the development of UTI but this association is not significant (OR =1.98), while in age group (30 - 89) had highly significant protection against UTI (OR= 0.18, P-value = 0.001).

In older age,⩾ 4o were almost seven times susceptible to developed UTI and this association is highly significant (OR=6.56, P value=0.ool)

Table 2: Association of foods with UTI

Food	Cases N= 100 N	%	Controls N= 100 N	%	OR	95% CI	P value
spicy	80	68.97	36	31.03	7.11	7.04 - 7.18	0.001
artificial sweeteners	13	48.15	14	51.85	0.92	0.90 – 0.94	NS
citrus	53	60.92	34	39.08	1.74	1.71 – 1.77	0.04
acidic fruits	94	51.09	90	48.91	6.56	6.49 – 6.63	NS
Coffee	45	53.57	39	46.43	1.28	1.21 – 1.35	NS
cola	59	57.84	43	42.10	1.9	1.83 – 1.97	NS

Spicy foods carried a very highly significant risk for the occurrence of UII (OR = 7.11, p-value = 0.001), also citrus has an association with UTI.

And this association is significant (OR=2.19, P value=0.04), acidic fruits, cola, and coffee were associated with the occurrence of UTI but this association is not significant (OR=1.74,1.9, 1.28 respectively).

Table 3: Association of pregnancy with UTI

Age group	Cases N= 100 N	%	Controls N= 100 N	%	OR	95% CI	P value
1st trimester	7	58.33	5	41.67	1.43	1.398 – 1.462	NS
2nd trimester	13	65.00	7	35.00	1.98	1. 94 – 2.02	NS
3rd trimester	10	52.63	9	47.37	1.12	1.08 – 1.16	NS
Total	100		100		-	-	-

(Table 3) revealed that there was an association of Pregnancy (all trimesters of pregnancy) with the UTI although this association was not significant.

Table 4: Association of other risk factors with UTI

Variables	Cases N	N= 100 %	Controls N	N= 100 %	OR	95% CI	P value
Drinking of water 6-8glass	31	30.79	71	69.21	0.18	0. 11 – 0.25	0.001
Calcium supplement	20	83.33	4	16.67	6.00	5.95 – 6.05	0.001
Birth control IUD	4	33.33	8	66.67	0.48	0.45 – 0.51	NS
Diabetes	10	66.67	5	33.33	2.11	2.07 – 2.15	NS
Condom	2	66.67	1	33.33	2.02	2.00 – 2.04	NS
Family history	65	59.09	45	40.91	2.27	2.20 – 2.34	0.05
Using catheter	7	35.00	13	65.00	0.50	0.46 – 0.54	NS
Retaining urine	71	77.71	61	22.83	9.21	9.14 – 9.28	0.001
Constipation	36	67.92	17	32.08	2.75	2.69 – 2.81	0.001
Occupation sitting	3	42.86	4	57.14	0.74	0.71 – 0.77	NS
Personal hygiene Good	29	30.85	65	69.15	0.22	0.15 – 0.29	0.002
Poor	71	66.98	35	33.02	4.55	4.48 – 4.62	0.005

In (Table 4) drinking of water 6-8 glasses in a day, it was highly Protective against the occurrence of UTI (OR=0.18, P-value = 0.001), calcium supplement had almost six times association to develop UTI (OR=6.00) and this association was a highly significant (P-value = 0.001).

There was an association between diabetes and UTI but this association was not significant (OR= 2.11), birth control using a condom was two times had an association with the development of UTI (OR= 2.02) but this association was not significant, family history of UTI occurred in about two times in cases more than in controls and carried a significant difference between the two groups (OR= 2.27, P value= 0.05), retaining urine (hold it in) occurred in about nine times in cases more than in controls and carried a highly significant difference between the two groups (OR= 9.21, P-value = 0.001), constipation was nearly three times more Prone to develop UTI and carried a highly significant risk difference (OR = 2.75, p-value = 0.001) good personal hygiene present to be highly significant protection against the occurrence of UTI.

DISCUSSION

To achieve the objectives of the present study, a case-control study design was carried out with the advantages being carefully balanced against the disadvantages. Among the well-known advantages of a case-control study was that the cases were easily available, it was relatively quick and inexpensive. The number of subjects needed to test the hypothesis of the association was small compared to other studies, and it was able to study more than one possible etiologic factor and explore interactions among the factors [29, 26, 27, 28].

One disadvantage of this method was that the controls represent a sample of health center Patients which might be different from People in the Community [25].

In this study a significant risk association between the older age group ⩾ 40 and UTI and this in agreement with other studies [9, 10,29]. While the age 30-39 in this study appeared to be significantly protective against the occurrence of UTI in contrast with other studies [31]. The age 20-29 in this study was associated with UTI and this in agreement with other studies [30].

A significant association was observed between spicy food and UTI, this in agreement with another study [24], there was no association between artificial sweeteners and UTI while other studies have reported an association of UTI with this factor [24]. the citrus was significantly associated with UTI also there was an association between acidic fruits, coffee, cola, and UII, these results were in agreement with other studies [32].

This study showed the association of Pregnancy with UTI, similar results have been reported elsewhere [33, 34, 35] and UTIs considered as the second most common ailment of pregnancy after anemia [35].The study also revealed a significant risk association between the amount of drinking of water >6 - 8 glasses in a day and UTI. This, too, following other studies [36, 37].

A significant association was observed between UTI and calcium supplement, similar results elsewhere also associated calcium supplement with UTI [22, 38, 39].

Diabetes was also found to be associated with UTI, other studies have also found that diabetes is considered as a risk factor for UTI, and women with diabetes have asymptomatic bacteriuria and UTIs more frequently than in women without diabetes [12,40].

The present study showed that there is no association between the IUD and UTI. Contradicting results have been observed in other studies between IUD and UTI and the use of IUD should be considered especially in women with recurrent UTI [13,41].

The study also investigated the possible association of UTI with using the condom as birth control, only two cases were observed and one among controls were used this birth control this in agreement with other studies [14, 42] although other studies have revealed controversial result for an association between Condom and UTI were found that the use of condom decrease the risk of a second UTI [43].

In this study, a significant risk association was found between UIT and women with a family history of UTI. Other studies have also found that women with a family history of UTI at risk of UTI [17, 44]. In this study no association between the use of catheters and UTI in contrast with other studies [18, 45].

The study also revealed significant risk associations between the retaining urine (hold it in) and UTI. Similar results have been reported [19, 46].

Constipation has also been a significant risk factor for the occurrence of UTI in this study. Other studies have similar findings[47, 48].

This study showed that no association between the occupation sitting and UTI while other studies have revealed controversial results [49]. In this study, there was a significant risk association between poor personal hygiene and UTI while good personal hygiene is considered as a significant protection against the occurrence of UTI. The other studies have revealed the same results [20, 50].

CONCLUSION

As previously mentioned, the prevalence of UTI in women places it among the most common ailments encountered in medical Practices and efforts should be focused not only on Proper antibiotic treatment but also on preventing recurrence as a way to help limit the widespread use of antibiotics.

All these risk factors, which are associated with UTI are modifiable. They should be taken into consideration for more trials to educate women about behavioral modification.

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