Frequency of Renal Colic during the Month of Ramadan

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Objective: To evaluate the effect of fasting during the month of Ramadan, which requires abstinence from fluid and food intake from sunrise to sunset (approximately 13–16 hours) daily for a whole month, on the frequency of emergency room visits for renal colic.

Design: A Retrospective Observational Study.

Setting: Bahrain Defence Force Hospital, Bahrain.

Method: A retrospective study was performed to evaluate the frequency of emergency room visits with diagnosis of renal colic one month prior to Ramadan, during Ramadan, and the month following Ramadan from April 2018 to July 2018 and April 2019 to July 2019.

Result: A total of 809 consecutive patients diagnosed with renal colic from April 2018 to July 2018 and April 2019 to July 2019 were included in the study. The total number of visits during the pre-Ramadan period was 200 (24.7%), 309 (38.2%) during Ramadan, and 300 (37.1%) post-Ramadan.

Conclusion: The frequency of visits to the ER with renal colic is noticeably higher during Ramadan and the following month, which may be attributable to fasting.

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Renal colic due to urinary stones is a common reason for emergency room (ER) visits and accounts for approximately 0.6% of emergency room visits[1].

Stones in the urinary tract system are due to the aggregation of crystals with non-crystalline protein components, most commonly due to the formation of calcium oxalate or calcium phosphate[2]. One of the important risk factors for stone formation is reduced oral fluid intake (low urinary volume); increasing fluid intake could reduce stone formation[3].

Ramadan is the ninth month in the lunar calendar and is a time when healthy Muslims all around the world are obligated to abstain from drinking and eating from sunrise to sunset daily for 29–30 days, which is approximately 13–16 hours per day in our region.

The effects of daily intermittent fasting during Ramadan on the number of incidences of renal colic have not been studied thoroughly in the literature; very few studies were published, and even those have variable and inconclusive outcomes.

The aim of this study is to evaluate the effect of intermittent fasting during Ramadan on the number of ER visits for renal colic.

METHOD

A retrospective cohort study was performed; the electronic records of the emergency room visits of patients diagnosed with renal colic were reviewed. All patients with renal colic one month before Ramadan, during Ramadan, and one month after Ramadan from April 2018 to July 2018 and April 2019 to July 2019 were included in the study.

The data were combined and divided into three parts: pre-Ramadan, during Ramadan, and post-Ramadan.

The diagnosis of renal colic was made based on physicians' clinical judgment according to history, classical clinical features, physical examination and radiologic studies.

The inclusion criteria included patients who were admitted to our ER with renal colic for whom any exclusion criteria were absent. The exclusion criteria included non-Muslim patients and patients for whom the diagnosis of renal colic was uncertain.

Data analysis was performed using Statistical Package for Social Science (SPSS) version 23.0. A descriptive analysis was performed. Data were expressed as frequencies and percentages, and continuous data were expressed as means (SD).

RESULT

A total of 809 patients with renal colic from April 2018 to July 2018 and April 2019 to July 2019 were included in the analysis. The total number of visits during the pre-Ramadan period was 200 (24.7%), 309 (38.2%) during Ramadan and 300 (37.1%) post-Ramadan.

Five hundred seventy-two (70.7%) patients were males, and 237 (29.3%) were females. The patients' ages ranged from 14 years to 75 years, with a mean age of 40 years (SD=13.14), see tables 1-2 and figures 1-2.

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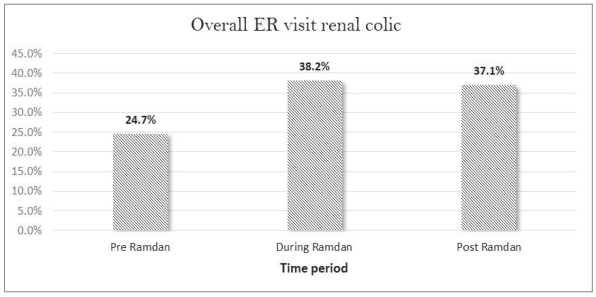

Figure 1: Number of ER visits

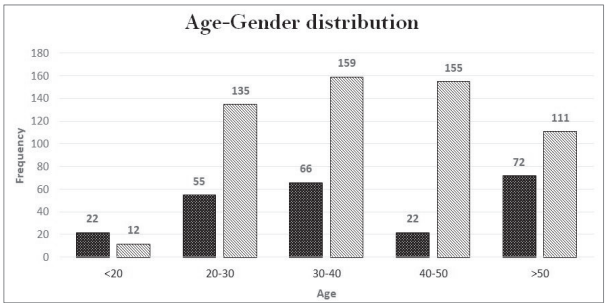

Figure 2: Overall Age–Gender Distribution

Table 1: Personal Characteristics

Variable	Frequency	Percentage
Gender		
Female	237	29.3%
Male	572	70.7%
Age (years)		
< 20	34	4.2%
20–30	190	23.5%
30–40	225	27.8%
40–50	177	21.9%
> 50	183	22.6%
ER visits due to renal colic		
Pre-Ramadan	200	24.7%
During Ramadan	309	38.2%
Post-Ramadan	300	37.1%

Table 2: Age and Gender Distributions in Different Time Periods

	Pre-Ramadan (n=200)	During Ramadan (n=309)	Post-Ramadan (n=300)	Total (n=809)
Gender				
Female	53 (26.50%)	93 (30.10%)	91 (30.30%)	237 (29.3%)
Male	147 (73.50%)	216 (69.90%)	209 (69.70%)	572 (70.7%)
Age (years)				
< 20	12 (6.0%)	13 (4.2%)	9 (3.0%)	34 (4.2%)
20–30	39 (19.5%)	86 (27.8%)	65 (21.7%)	190 (23.5%)
30–40	55 (27.5%)	76 (24.6%)	94 (31.3%)	225 (27.8%)
40–50	49 (24.5%)	63 (20.4%)	65 (21.7%)	177 (21.9%)
> 50	45 (22.5%)	71 (23.0%)	67 (22.3%)	183 (22.6%)
Total				**809 (100%)**

DISCUSSION

Dehydration and low urine volume are well-established risk factors for the formation of renal stones. Many epidemiologic and experimental studies suggest that patients with a prior history of renal stones should have a urine volume of >2L for 24 hours to reduce the risk of forming new stones[4-6]. It may be difficult for the fasting Muslim to maintain this urine volume, which raises the question of whether fasting in the month of Ramadan could increase the formation of renal stones.

Muslims start drinking fluids and eating after sunset in larger amounts over a shorter period in comparison with non-Ramadan months, which raises a second question: Does such a habit play a role in the propulsion of renal stones to the pelviureteric junction/ureter and cause an obstruction and the consequent attack of renal colic?

Few studies have looked into this subject with variable and conflicting outcomes. Al-Hadramy et al investigated the seasonal variations in the frequencies of renal colic in the western region of Saudi Arabia for three consecutive years and reported that the highest rates of renal colic admission were found in June, July, and August. However, as rates of admission for renal colic during Ramadan were similar to rates in other months, he concluded that the highest frequencies of renal colic were in warmer months[7]. Basiri et al investigated the effect of Ramadan on the number of renal colic visits in Iran, and they found that there was no significant difference between the frequencies of patients with renal colic in Ramadan and non-Ramadan months, in which air temperatures were similar[8]. Miladipour et al found no evidence of increased risk of stone formation during Ramadan fasting while investigating the changes in urinary excretion of calcium, oxalate, citrate, uric acid, magnesium, phosphate, potassium, sodium, and creatinine in 37 patients with previous histories of stones and 20 patients with no previous stone history[9].

Abdulreza et al found that the highest frequencies were during the first two weeks of Ramadan (n=195), which were significantly higher than the number of visits two weeks before the month of Ramadan (n=157) and the number of visits two weeks after Ramadan (n=119). However, the number of admissions during the second half of Ramadan (n=139) was not significantly higher than the other periods[10].

The results of our study showed that the number of visits for renal colic during the month of Ramadan (n=309) and the month following (n=300) was significantly higher than the number of visits for renal colic in the month before Ramadan (n=200).

The study has two main limitations. First, we did not compare the relation between frequencies of renal colic and temperature differences during the study period, which could have an impact on the number of visits for renal colic. The second limitation is that many patients were diagnosed by the clinical judgment of the physician, and not all of the patients' diagnoses were confirmed by non-contrast-enhanced computed tomography of the kidney, ureter, and bladder, which is the gold standard modality for the diagnosis of urolithiasis.

CONCLUSION

The frequency of visits to the ER for renal colic is noticeably higher during Ramadan and the following month, which

may be attributable to fasting. However, further studies are needed to investigate the effects of fasting during the month of Ramadan and to relate them to climate changes.

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