Monthly Variations of Urinary Stone Colic in Iran and its relationship to the Fasting Month of Ramadan

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Abstract

Objective: To compare the prevalence of Renal Colic (RC) in Ramadan (the month of fasting for Moslems) with other months of the lunar year.

Materials and Methods: Records of 574 subjects, who were admitted in the two medical centers of Varamin (a city in a hot region of Iran), were reviewed in order to estimate the time trend of RC.

Results: This study included 398 males (69.3%) and 176 females (30.7%). Twenty-seven males (62.8%) and 16 females (37.2%) were admitted in Ramadan; and 371 males (69.9%) and 160 females (30.1%) in other months ($p<0.4$) of the year. RCs were more common in June (68 patients, 11.8%), July (65 patients, 11.3%) and November (60 patients, 10.5%). Forty-three subjects (7.5%) admitted in Ramadan; the frequency was not significantly different from mean admission of the year (48.3 ± 17 patients). There was also no significant difference between frequency of admissions in Ramadan and mean admission during cold half of the year (36.8 ± 18.34 patients, $p = 0.3$). Mean admission (64.4 ± 3.3 patients) in warm seasons were significantly higher than Ramadan ($p < 0.001$).

Conclusion: Lack of difference in the two groups indicates that higher temperature rather than fasting as a cause for RCs (JPMA 54:6;2004).

Introduction

The highest incidence of renal stone diseases has been reported during the months of July, August and September, when presumably dehydration due to perspiration is common and the urine contains high concentration of lithogenic substances.[1] The type of food and amount of water consumed are important considerations in the production of urinary stone.[2] The incidence of stone disease is expected to increase in patients with persistently low urinary volumes, especially in warmer seasons.[3] Several factors could explain the effect of warm sunny weather on kidney stone formation. Some previous researches have demonstrated that both urinary calcium excretion and renal stone episodes are increased during the warmer weather.[4] Urinary electrolytes have circadian and circannual variation.[5] Trend of renal colic as "stone wave" has been explained in terms of changing social conditions and the consequent changes in eating habits.[6] Serum 25 (OH) D3 level, urinary calcium and oxalate excretion are higher during May to October than November to April in all except the long - stay hospital patients.[6] The effects of fasting on these variations have not been determined in previous studies. Some investigators found that the frequency of kidney colics in the summer was higher than winter which might be due to a relative D hypervitaminosis, a greater intake of oxalate or a relative dehydration.[7] Although the limitation of water consumption & decreasing of urinary volume are likely during fasting, the effect of fasting on urinary stone formation is controversial.[8]

This study was done in Varamin ,a city with religious people in the border of a desert in Iran, to compare the prevalence of RC between Ramadan and other months of the year.

Subjects and Methods

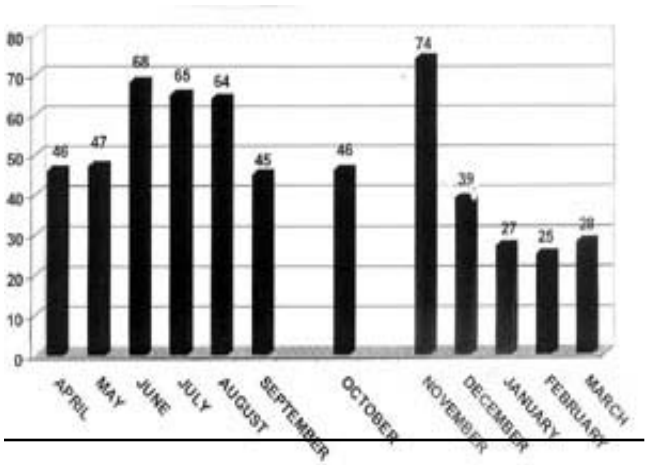
In this observational study all records of emergency room at "Mofatteh" and "15 Khordad" hospitals, the only two hospitals of Varamin, were studied from March 2000 to March 2001. Patients with urinary colic during this period were recorded on monthly basis with correction for 30 days a month of lunar calendar. Data were recorded before, during and after the fasting month of Ramadan (the month that all Moslems are obliged to abstain from food and drink for about 12 hours a day, from sunrise to sunset).

A retrospective questionnaire and a checklist, as our data collection methods, were filled in for each record. The validity of data was checked for all variables. The incidence of urinary stone colic in Ramadan and hot seasons was compared with other months of the year. The outcome was defined as an acute attack of renal colic; neither drugs nor chemicals were evaluated in this study. No intervention was assessed in our investigation. Frequencies in Ramadan and other months of the year were compared using unpaired T-test.

Results

This study included 574 subjects with stone colic, 398 males (69.3%) and 176 females (30.7%). The mean age of subjects was 36.4 ± 14 years.

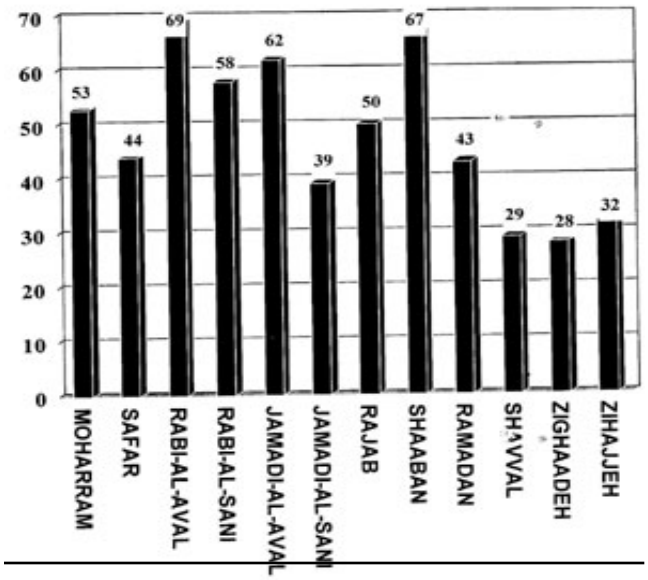
There was a steady increase in urinary stone colic in the hot seasons with a maximum rate in the months of June,



July, August and November (Figure 1). The frequencies of patients with stone colic in these months were 68 (11.8%), 65 (11.3%), 64 (11.1%) and 74 (12.9%), respectively.The lowest number was in February (25, 4.4%). January (27, 4.7%) and March (28, 4.9%) also had low frequencies.

In lunar calendar (Arabic months) a maximum rate was observed in months of Rabi-ol-aval (between April and May; 69 paients, 12%), Shaaban (between September and October; 67 patients, 11.7%) and Jamadi-ol-aval (between June and July; 62 patients, 10.8%). According to this calendar the lowest number of patients were admitted in Zighadeh (between November and December; 28 patients, 4.8%) and Shavval (between November and December; 29 patients, 5%) (Figure 2). Our admissions included 27 males (62.8%) and 16 females (37.2%) in Ramadan-between October and November-and 371 males (62.8%) and 160 females (30.1%) in other months (p=0.3).

Forty-three subjects (7.5%) were admitted in Ramadan, this number was not significantly different from



the mean admission of the other months of the lunar year (43.3 ± 17 patients, p=0.14).Mean admission in warm seasons (64.4 ± 3.3 patients) was significantly higher than Ramadan (p= 0.001). There was also no significant difference between mean admission in Ramadan and second half of the year (36.8 ±18 patients, p=0.32). Figure 2 shows the monthly variations of renal colic in Varamin City.

Discussion

The effect of intrinsic factors including age, sex and heredity as well as extrinsic factors like geographic situation, climatic and seasonal factors, water intake, diet and occupation, on renal colic and kidney stone disease have been determined.[1]

The incidence of stone disease is expected to increase in warmer seasons, presumably because of perspiration and low urinary volume[3], increased urinary calcium excretion[4] and circannual variation.[5] Change in social condition and alteration in eating habits also have an influence. The effect of fasting month of Ramadan, the holy month when all Moslems are obliged to abstain from food and drink for about 12 hours a day, is under debate. Co-incidence of this month in warmer season may alter the real effect of fasting on renal colic. In this study we tried to measure the incidence of renal colic in Ramadan compared with other months of the year.

Observed frequency of renal colic in Ramadan was not significantly higher than the expected frequency. According to the study of Al-Hadramy[8] no significant increase in urinary stone colic was observed in relationship to the fasting month of Ramadan; therefore the effect of Ramadan fasting on the occurrence of urinary stone colic is under question. Our results showed an increase in urinary stone colic in the hot seasons with a maximum rate in the months of June, July, August and also November. Our findings and report of Al-Hadramy suggest that there is a a stone season in our region corresponding to the hot summer months.

Lesser number of patients in March, January and February were not unexpected. Our study showed that admission rate of renal colic in Ramadan is not significantly different from the rate of admission in the rest of the year; however, it is lower than the warm seasons. These findings explain the effect of climatic changes on the occurrence of urinary stone colic regardless of the effect of Ramadan fasting.

Study of Baker et al. demonstrated significant seasonal variation in urinary stone incidence. He also showed that men are at a higher risk of forming stones than women, with the exception of infections stones.[9] The incidence of infectious stones were not determined in our

study, but male to female ratio in Ramadan and remaining months of the year, was similar.

Torres Ramirez et al.[7] studied the influence of the season, age, sex and composition of the drinking water on the incidence of renal colic in patients of different villages in Granada. They found that in the summer the frequency of kidney colic was double than winter. They suggested this phenomenon may be due to a relative D hypervitaminosis, a greater intake of oxalate or a relative dehydration. As the study of Ramirez shows, higher incidence of renal colic in warmer seasons might be influenced by numerous factors. Of course, relative dehydration in Ramadan was not investigated in our study, but as a risk factor, low fluid intake in Ramadan does not seam to alter the trend of renal colic in cold weather.

The epidemiology of urolithiasis differs in diverse geographical areas throughout the year. Fasting in Ramadan per se, does not seem a risk factor for lithiasis. Other effects of fasting on renal function including renal excretion of calcium, oxalate and other chemical compounds should be investigated in further studies.

Acknowledgements

This study was supported by a grant from Urology, Nephrology Research Center, Shahid Beheshti University of Medical Sciences of Islamic Republic of Iran. We thank our colleagues for their help in conducting this study.

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