

# Effect of Diet During Ramadan on Patients on Chronic Haemodialysis

Abdullah A. Al-Khader, Mohammed K. Al-Hasani, Jag M. Dhar, Mohammed Al-Sulaiman

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تختلف العادات القوتية خلال شهر رمضان عن بقية السنة. هنالك ميل نحو زيادة استهلاك الطعام - خاصة الأطعمة الغنية بالبوتاسيوم - والسوائل عقب الافطار عند غروب الشمس. درسنا أثر هذا التغير القوتي عند مرضى الديال لدينا، وقد فحصنا التغيرات في زيادة الوزن وضغط الدم والكهارل في المدة بين الديالي في أربعين مريضاً قبل وأثناء شهر رمضان، وقد وجدنا زيادة معتدلة في الوزن ومستوى البوتاسيوم بين الديالي أثناء شهر رمضان لكن بدون تبدلات معتدلة في ضغط الدم وصوديوم المصورة والكرياتينين واليوريا والفسفات.

Dietary habits differ during Ramadan from the rest of the year. There is a tendency for increased consumption of food — particularly potassium-containing foods — and fluids following the breaking of the fast at sunset. We studied the effect of such dietary change in our dialysis population. We looked into changes in interdialytic weight gain, blood pressure and electrolytes in 40 patients before and during Ramadan. We found a significant increase in interdialytic weight gain and potassium level during Ramadan but no significant changes in blood pressure, plasma sodium, creatinine, urea or phosphate.

Ramadan is a special month for Moslems. Beside the obligatory fasting from dawn to sunset, for those able to do so, and the many important religious duties and obligations that accompany fasting, there are a number of social changes, particularly related to sleep and waking patterns, and changes in food and fluid intake after breaking the fast, both in terms of quantity and type consumed. Many of the traditional drinks and foods consumed in Ramadan have a high content of potassium. This study attempts to discover if these changes in habits during Ramadan have implications for our dialysis patients regarding interdialytic weight gains and blood pressure as well as electrolyte changes.

Department of Nephrology, Armed Forces Hospital, PO Box 7897, Riyadh 11159, Saudi Arabia  
 ABDULLAH AHMED AL-KHADER MD(Lond) BSc(Lond)  
 FRCP(Lond) FRCP(Edin), Senior Consultant and Head  
 MOHAMMED KHEIR AL-HASANI MRCP(UK), Consultant  
 JAG MOHAN DHAR MD MRCP(UK), Senior Registrar  
 MOHAMMED AL-SULAIMAN MRCP(UK), Consultant

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## Patients and Methods

Forty patients were studied with a mean age 35.5 years, range 15-72 years. All these patients had been on dialysis for over 6 months (6 months to 6 years). All were either dialysed two or three times a week and all were fasting on the days off dialysis but not on dialysis days. They continued on their normal medication unchanged throughout the study. No attempt was made to assess dietary intake during Ramadan. The dialysis details and procedures were kept the same throughout the study period.

The patients acted as their own controls and the following parameters were measured weekly during Ramadan and for a whole month immediately prior to Ramadan: weights before and after dialysis, blood pressure before and after dialysis and serum potassium, Na, urea, creatinine, calcium, phosphate and bicarbonate before dialysis. These were measured using an Auto-analyser. Statistical tests were performed using the Wilcoxon Tante Finn test.

## Results

### Weight changes

The mean interdialytic weight gain during the month prior to Ramadan was  $2.2 \text{ kg} \pm 0.3$  and during the month of Ramadan was  $2.84 \text{ kg} \pm 0.35$ , the difference being significant at  $p < 0.01$ . No patient, however, presented as an emergency with pulmonary oedema.

*Blood pressure changes*

Despite the difference in the interdialytic weight changes, there was no significant difference in the mean blood pressure before Ramadan and during Ramadan, the mean arterial blood pressures being 100.7 and 101 mmHg respectively.

*Electrolyte changes*

There was no significant difference regarding plasma sodium, plasma creatinine, plasma urea, plasma phosphate or plasma bicarbonate concentrations.

The plasma potassium concentration, however, showed a highly significant difference between the two groups, being  $5.05 \pm 0.4$  mmol/l in the month before Ramadan and  $5.76 \pm 0.45$  mmol/l during Ramadan ( $p < 0.05$ ). More significantly, whereas only four of the patients had plasma potassium concentrations in the period before Ramadan of over 6.5 mmol/l, 14 had plasma levels of 6.5 mmol/l or more during Ramadan. However, no clinically adverse effects of hyperkalaemia were noted.

**Conclusions**

There have been a number of papers describing changes in blood constituents during Ramadan.<sup>1-4</sup> Changes in lipoprotein were described by Hazmi *et al.*,<sup>1</sup> Shoukry<sup>2</sup> and Gumma *et al.*<sup>3</sup> Plasma electrolyte changes were described by Hazmi *et al.*<sup>1</sup> and Mustafa *et al.*<sup>4</sup> However, all of these dealt with changes that occur in normal individuals and not in patients. This paper, on the other hand, describes changes in blood biochemistry in patients—namely those with end stage renal disease who are on dialysis.

There is a general tendency to take a lot of fluids after breaking the fast in Ramadan and throughout the evening until dawn. This would explain the significant rise in interdialytic weight in our patients. Some individuals drink over 3 litres of water, juices, coffee, soup etc. between sunset and sunrise.

It is traditional to break the fast with dates, apricot juice and coffee, all of which contain a lot of potassium.

It is not unusual to consume during breaking the fast, 8 to 10 dates, a glass of juice and a few cups of coffee and laban. This would provide over 80 mmol of potassium. Further potassium-containing foods will be consumed throughout the evening. This would explain the significant rise in potassium we noted in our patients.

It is unlikely that fasting ketosis contributed to the rise in potassium in our patients as there was no significant change in plasma bicarbonate level before and during Ramadan. Moreover, the blood sampling took place before dialysis, on the days the patients were not fasting and 10–16 h after breaking the fast during Ramadan.

It is of interest that Hazmi *et al.*<sup>1</sup> found a significant rise in the plasma potassium level in his own controls. However, this appeared only by the fourth week of Ramadan and was only of a mild and clinically insignificant nature.

In view of the changes in weight and potassium observed in our patients, it would be advisable for dialysis units to be aware of these and give added advice to patients regarding their diet, or to apply appropriate measures to protect against hyperkalaemia and fluid overload through dialysis or other therapeutic agents. More frequent estimates of plasma potassium are also mandatory during Ramadan.

**References**

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