

Impact of Fasting During the Month of Ramadan on the Clinical and Anthropometric Parameters of Chronic Hemodialysis Patients at the Thies Regional Hospital Center

Ameth Dieng*, Mamadou Aw Ba, Aimé Gomintan, Mame Selly Diawara, Mouhamadou Moustapha Cissé

Received: 30 August, 2025, Manuscript No. ipjcen-25-20634; **Editor assigned:** 01 September, 2025, PreQC No. P-20634; **Reviewed:** 15 September, 2025, QC No. Q-20634; **Revised:** 20 September, 2025, Manuscript No. R-20634; **Published:** 27 September, 2025, DOI: 10.36648/2472-5056/10.2.295

Department of Nephrology, Thiès Regional Hospital, Thiès, Senegal

*Corresponding author:

Ameth Dieng

✉ ameth.dieng@univ-thies.sn

Tel: 0000-0002-2212-7243

Department of Nephrology, Thiès Regional Hospital, Thiès, Senegal

Citation: Dieng A, Ba MA, Gomintan AM, Diawara MS, Cissé MM. (2025) Impact of Fasting During the Month of Ramadan on the Clinical and Anthropometric Parameters of Chronic Hemodialysis Patients at the Thies Regional Hospital Center. J Clin Exp Nephrol Vol. 10 No. 2:295

Abstract

Introduction: Although there are clear instructions regarding the exemption from fasting for those who are sick or likely to suffer from fasting, a significant number of patients decide to fast regardless of medical or religious advice. This poses a particular challenge for physicians treating patients with CKD. Few studies have evaluated the impact of fasting in patients with CKD. To our knowledge, no studies have been conducted in Senegal that evaluated fasting in chronic hemodialysis patients. The aim of our work was to evaluate the changes in clinical and anthropometric parameters of fasting patients before and after Ramadan.

Patients and method: This was a prospective, descriptive, and analytical study running from March 20 to April 24, 2023 in patients with chronic renal failure who were regularly hemodialyzed in the nephrology and dialysis department of the Thiès regional hospital. All participants signed a free and informed consent form. The data studied were age, sex, socioeconomic level, comorbidities, fasting concept, number of days fasting, weight, BMI, upper arm circumference, BP, dialysis parameters (PRU, Kt/V, incidents/accidents, etc.). Anthropometric data on body fat percentage, visceral mass level, and skeletal muscle percentage were collected using an Omron Healthcare BF511 body composition analyzer impedance meter scale. We measured these parameters one week before Ramadan and one week after Ramadan, and then we compared these data in each group of patients (fasters and nonfasters). Then we analyzed the differences in variations between the two groups of patients. A difference was statistically significant when the p value < 0.05. Data entry and analysis were performed using Epi Info version 7 software.

Results: Of 52 chronic hemodialysis patients, 12 had fasted during the month of Ramadan (23.1%) with 15 ± 7.1 days of fasting on average. The mean age of the patients was 47.0 ± 12.0 years with a male predominance of 55.8%. Hypertensive nephropathy was the main initial nephropathy in 51.9%. In the fasting group as in the nonfasting group, no statistically significant differences were found in relation to the clinical and anthropometric data before Ramadan and after Ramadan. No impact of fasting on dialysis parameters was found in the 2 groups of patients. When comparing data

variations between the fasting patient group and the non-fasting patient group, there was a statistically significant decrease in post-dialysis Diastolic Blood Pressure (DBP) in faster people compared to nonfasters ($p = 0.039$).

Conclusion: Fasting during the month of Ramadan has no negative impact on the clinical, anthropometric and dialysis parameters of chronic hemodialysis patients. A national-scale study that includes biological data must be carried out for a better assessment.

Keywords: Fasting; Chronic hemodialysis; Clinical ; Anthropometric

Introduction

The practice of fasting during the month of Ramadan consists, for Muslims, of abstaining from eating, drinking, sexual relations, smoking, or committing sins, from dawn until sunset. It is prescribed to all healthy Muslims beyond puberty [1]. Although there are clear instructions regarding the exemption from fasting for those who are sick or likely to suffer from fasting, a significant number of patients decide to fast regardless of medical or religious advice. This poses a particular challenge for physicians treating patients with Chronic Kidney Disease (CKD). Ramadan brings about changes in eating habits in Muslim countries that affect not only those who fast, but also those who do not. Few studies have evaluated the impact of fasting in patients with CKD. Fasting can lead to a chronic suboptimal energy intake that predisposes to a higher risk of malnutrition through sudden increases in fluid intake after breaking the fast [2].

Apart from this, Ramadan fasting was associated with reduced body weight but improved serum albumin and phosphate levels in a Malaysian hemodialysis population, which may indicate improved fluid control rather than nutritional depletion, although no evaluation of dietary intake was reported for the study [3]. Several studies highlight confounding factors such as variations in daily fasting time, demographic data of the patients, hydration status, and diversity in eating habits and food culture that indicate a lack of understanding of the real impact of intermittent fasting during Ramadan on the nutritional status of patients [4]. Furthermore, there is a lack of evidence to guide patients and clinicians in the management of fasting in people with CKD. However, published data on fasting patients on hemodialysis suggest that it appears relatively well tolerated and is not associated with significant morbidity or mortality, although changes in electrolytes (particularly potassium and phosphorus) require careful monitoring [5].

In Senegal, we are a predominantly Muslim population, and many chronic hemodialysis patients observed the fast of Ramadan before their illness and always expressed their desire to continue fasting with or without medical advice. In addition, the climatic conditions of the country are quite favorable, which encourages these patients to practice fasting. This is how we conducted a prospective, descriptive, and analytical study at the Thiès hemodialysis center. The objectives of this study were to evaluate the changes in clinical and anthropometric parameters of fasting

patients before and after Ramadan, then to compare them to nonfasting patients, and finally to propose recommendations in our context.

Patients and Methods

This was a single-center, cross-sectional, observational, cross-sectional prospective study comparing stable fasting and nonfasting adult hemodialysis patients for clinical and anthropometric parameters ranging from March 20 to April 24, 2023. All subjects had agreed to participate voluntarily in the study after signing a free and informed consent form. Participants were allowed to break their Ramadan fast at any time of the day for any reason. The treating physician recorded self-reported symptomatic hypoglycemic events. Hypoglycemic symptoms included tremors, dizziness, hunger, nausea, and feelings of fainting or fainting. The Ramadan period of 2023 in Senegal was from March 22 to April 21. During this period, fasting time slots were between 5:50 a.m. and 7:22 p.m., that is, approximately 14 hours with temperatures ranging from 25 °C to 32 °C during the day.

Included were adult patients who had been hemodialyzed for more than three (03) months in the department with two to three hemodialysis sessions per week of 4 hours and who agreed to participate in the study. We also excluded all patients who were unstable or had recurrent pulmonary edema, mental disability, recurrent hypoglycemia, poorly controlled diabetes mellitus, hospitalization over the last 3 months. Data were collected over two periods: one week before the month of Ramadan and one week after the month of Ramadan using a preestablished survey form. A guided interview covering marital status, medical history, causal nephropathy, and length of dialysis was submitted to the various participants. The values of the dialysis parameters were collected in their dialysis notebook mentioning the following: duration of the session, number of sessions per week, ultrafiltration in ml/kg/hour, blood flow in ml/min, KT/V, baseline weight, interdialytic weight gain (IDWG), systolic blood pressure (SBP), diastolic blood pressure (DBP), existence or absence of intradialytic hypotension or hypertension. Anthropometric parameters were assessed with an electric scale fitted with a measuring rod (Figure 1) to measure weight and height, an Omron Healthcare BF511 body composition analyzer impedance meter scale (Figure 2) for body fat percentage, the level of visceral mass, resting metabolism, percentage of skeletal muscle.



Figure 1 Personal scale with measuring rod.



Figure 2 Electrical bio-impedance meter unit BF511 omron.

The information collected was recorded using the Excel 2013 software. Qualitative variables were expressed as proportions, and quantitative variables were expressed as mean and standard deviation. Data entry and analysis were performed with Epi info software version 7. Any p-value less than 0.05 were considered statistically significant.

Result

During the study period, 64 patients were on chronic hemodialysis in the center. Twelve patients presented clinical instability, including hospitalization, incidents, or accidents related to dialysis. Thus, the study included 52 patients among whom 12 patients (23.1%) observed fasting during the months of Ramadan. The average age of the patients was 47.0 ± 12.0 years with a male predominance of 55.8%, ie a sex ratio of 1.3. The socioeconomic level was low in 88.5% of the patients and medium in 11.5%. Hypertensive nephropathy was the main causal nephropathy in 51.9% (Table 1).

Thirteen patients (25%) had comorbidities. Fasting was observed in 23.1% of the patients. The average number of fasting days was 15 ± 7.1 days. The median was 15 days. The causes of non-youngness were not documented. No complications or deaths were reported during this period. When comparing data before

and after Ramadan in fasting patients, no statistically significant differences were found in clinical and anthropometric parameters (Table 2).

In the group of nonfasting patients, there were no statistical variations in all the data studied (Table 3).

Comparing data variations between the fasting patient group and the non-fasting patient group, there was a statistically significant decrease in post-dialysis diastolic blood pressure (DBP) in fasting compared to non-fasting ($p = 0.039$) (Table 4).

Discussion

In our study, 12 of 52 chronic hemodialysis patients (23.1%) observed fasting during Ramadan month. This rate is relatively low compared to the series of Al-Khader in Saudi Arabia [6] and Al Wakeel [7] in Malaysia with, respectively, 40 and 87 patients who had fasted Ramadan. This difference would be related to the poor nutritional status of our patients and the moncentric study.

In fasting patients as in nonfasting patients, we did not observe significant variations in baseline weight, BMI, waist circumference, and upper arm circumference after Ramadan. Adanan found statistically significant variations in BMI before, at the end and after Ramadan in patients who fasted for more than 20 days [8].

Table 1. Distribution of patients according to causal nephropathy.

Causal nephropathy	Effective (n)	Percentage (%)
Hypertensive nephropathy	27	51.9
Undetermined nephropathy	10	19.2
Mixed (diabetic and hypertensive)	4	7.7
AKf post-partum	4	7.7
Glomerular nephropathy	3	5.8
Multicystic kidney disease	1	1.9
CTIN	1	1.9
ADPKD	1	1.9
Cardio-renal syndrome	1	1.9
Total	52	100.0

Table 2. Variations in anthropometric data and dialysis before and after Ramadan among fasting groups.

Parameters	Fasting group		p value
	Before	After	
Average dry weight	66.17	66.21	0.977
Average BMI	22.21	22.03	0.977
Upper arm circumference	27.46	28.08	0.543
Average waistline	78.23	78.42	0.908
Average body fat	21.25	21.78	0.844
Muscular mass	35.07	35.55	0.974
Average visceral fat	5.18	4.91	0.816
Average IDWG	2.60	3.22	0.817
IDWG ≤ 1.5	11(50.0)	11(50.0)	1.00
IDWG >1.5	1(8.3)	1(8.3)	1.00
SBP pre dialysis	160.66	159.22	0.644
SBP post dialysis	166.14	156.39	0.214
DBP pre dialysis	101.12	97.94	0.544
DBP post dialysis	100.25	93.53	0.263
SBP Difference	-5.47	-2.83	0.356
DBP difference	-0.86	-4.42	0.665
Intradialytic hypertension	3(25.0)	3(25.0)	0.100
Intradialytic hypotension	3(25.0)	4(33.3)	0.653
Average Kt/V	1.45	1.49	0.69
Kt/V ≤ 1.2	11(50.0)	11(50.0)	1.00
Kt/V >1.2	1(8.3)	1(8.3)	1.00
Average RRU	75.78	77.08	0.470
RRU ≤ 70%	10(83.3)	10(83.3)	1.000
RRU >70%	2(16.7)	2(16.7)	1.000

In the same work, the authors observed a significant reduction in the circumference of the upper arm at the end of Ramadan [8]. In different cultures, different types of food are eaten during Ramadan. Some prefer festive foods with a higher sugar, protein, and fat content, while others simply reduce their food intake, leading to differential effects on body weight [9]. It should also be noted that despite the reduction in meal frequency, food intake after breaking fast is often very large to compensate for energy losses, which would explain the preservation of weight and other parameters in our study.

Interestingly, we did not find a statistically significant change in IDWG after Ramadan. This result did not corroborate other studies. Al Khader found an IDWG during Ramadan higher than the IDWG before Ramadan with a statistically significant difference [6]. In Khazneh's work in Palestine, patients fasting

had a mean interdialytic weight gain of 0.62 kg higher than patients not fasting (95% Confidence Interval (CI) 0.26, 0.99) after adjustment for diabetes and hypertensive status and other sociodemographic variables [10]. Adanan found the opposite, with a significant reduction in IDWG at 4 weeks of Ramadan [8]. These discrepancies could be related not only to water intake, but also to the climatic factor, sodium intake, eating habits, number of dialysis sessions, etc.

To better assess the impact of fasting, we used the impedance-meter to measure the proportions of fat mass, muscle mass and visceral fat. No significant changes were observed after the Ramadan period. A study carried out in Saudi Arabia in 87 hemodialysis patients showed that fat mass decreased significantly after 4 weeks of fasting during Ramadan and then increased 4 weeks after Ramadan month [8]. The decrease in fat

Table 3. Variations in anthropometric data and dialysis before and after Ramadan in nonfasters.

Parameters	Non-fasters		p value
	Before	After	
Average dry weight	62.25	62.56	0.908
Average BMI	21.62	21.56	0.951
Upper arm circumference	26.60	27.91	0.405
Average waistline	82.08	80.19	0.540
Average body fat	23.14	22.74	0.888
Muscular mass	33.37	33.91	0.736
Average visceral fat	1421.65	1428.71	0.874
Average IDWG	2.79	2.49	0.250
IDWG ≤ 1.5	5(12.50)	7(17.5)	0.531
IDWG >1.5	35(7.50)	33(82.5)	
SBP pre dialysis	155.66	155.14	0.902
SBP post dialysis	161.12	159.00	0.613
DBP pre dialysis	96.34	96.51	0.974
DBP post dialysis	96.64	97.46	0.803
SBP Difference	5.45	3.85	0.612
DBP difference	0.25	0.95	0.809
Intradialytic hypertension	13(32.50)	6(40.0)	0.485
Intradialytic hypotension	5(12.50)	10(25.0)	0.151
Average Kt/V	1.47	1.51	0.311
Kt/V ≤ 1.2	3(7.50)	3(7.50)	1.000
Kt/V >1.2	37(92.50)	37(92.50)	
Average RRU	77.05	76.42	0.616
RRU ≤ 70%	3(7.50)	10(10.0)	0.692
RRU >70%	37(92.50)	36(90.0)	

Table 4. Comparison of data variations between fasting and nonfasting patients.

Parameters	Fasters	Non-fasters	p value
Dry weight (Kg)	+0.04	+0.31	0.246
BMI (Kg/m ²)	-0.18	-0.05	0.695
Upper arm circumference (cm)	+0.63	+1.31	0.798
Waist circumference (cm)	+0.18	-3.89	0.449
Fat mass (%)	+0.55	-0.06	0.619
Muscular mass (%)	+0.42	-0.25	0.779
Visceral Fat (%)	0.27	-0.06	0.497
IDGW (Kg)	+0.62	-0.29	0.053
SBP pre dialysis (mmHg)	-1.45	-0.53	0.849
SBP post dialysis (mmHg)	-9.75	-2.12	0.121
Pre-dialysis DBP (mmHg)	-3.17	+0.13	0.447
Post dialysis DBP (mmHg)	-6.72	+0.82	0.039*
Difference SBP post and pre dialysis (mmHg)	-8.30	-1.59	0.214
Difference DBP post and pre dialysis (mmHg)	-3.55	+0.069	0.418
Intradialytic hypertension after Ramadan (%)	3(25.0)	16(40.0)	0.344
Intradialytic hypotension after Ramadan	4(33.3)	10(25.0)	0.568
Kt/V	+0.04	+0.04	0.993
Kt/V ≤ 1.2 after Ramadan (%)	2(40.0)	3(60.0)	0.345
Kt/V >1.2 after Ramadan (%)	10(21.28)	37(78.72)	-
RRU	+1.31	-0.63	0.251
RRU ≤ 70% after Ramadan (%)	2(33.33)	4(66.67)	-
RRU >70% after Ramadan (%)	10(21.74)	36(78.26)	0.526

mass observed in this work could be explained by the breakdown of adipose tissue as the main source of energy during fasting following depletion of glycogen reserves, while preserving muscles. However, fasting for Ramadan could provide a short-term benefit in reducing body fat while preserving muscle mass in this population. As in our work, preservation of muscle mass was similarly reported in Adanan's study [8]. An increase in physical activity related to prolonged prayers after sunset (equivalent to movements related to stretching) could be an explanation.

We did not find a statistically significant difference in SBP and DBP before and after Ramadan in fasting patients as well as nonfasting patients. Bernieh in the United Arab Emirates observed a decrease in SBP and DBP after the month of Ramadan in all patients with CKD [11].

Other studies reported that Ramadan fasting is not associated with blood pressure control despite a significant reduction in IDWG [6,8]. When comparing the levels of variation in post-dialysis DBP between fasting and non-fasting patients, we found a statistically significant difference (-6.72 mmHg vs. +0.82 mmHg; $p = 0.039$). In Adnan's series, post-hemodialysis SBP and DBP increased significantly at the end of the Ramadan fast in non-diabetic patients [3]. However, fasting may not affect BP control and other factors such as sodium and fluid intake, antihypertensive medications, etc. should be taken into account.

Kt/V before and after Ramadan without statistically significant difference. This is the same observation made by Al Wakeel in a group of hemodialysis patients in Saudi Arabia [7].

Conclusion

Fasting during the month of Ramadan has no negative impact on clinical, anthropometric parameters, and dialysis dose. We recommend carrying out additional multicenter studies including biological data to better understand the effect of fasting during the month of Ramadan in patients with CKD.

Limitations of the Study

The small sample size and the single center study were limitations. We were unable to analyze changes in biological parameters due to a lack of funding.

Conflicts of Interest

None.

References

1. Lugo L, Cooperman A, O'Connell E, Stencel S. (2011) The future of the global Muslim population. Pew Research Center USA 1-209.
2. Bradbury BD, Fissell RB, Albert JM, Anthony MS, Critchlow CW, et al. (2007) Predictors of early mortality among incident US hemodialysis patients in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Clin J Am Soc Nephrol* 2: 89-99.
3. Wan Md Adnan WAH, Zaharan NL, Wong MH, Lim SK (2014). The effects of intermittent fasting during the month of Ramadan in chronic haemodialysis patients in a tropical climate country. *PLoS one* 9: e114262.
4. Bragazzi NL (2014) Ramadan fasting and chronic kidney disease: A systematic review. *J Res Med Sci* 19: 665.
5. Ahmad S, Chowdhury TA (2019) Fasting during Ramadan in people with chronic kidney disease: a review of the literature. *Ther Adv Endocrinol Metabol* 10: 2042018819889019.
6. Al-Khader AA, Al-Hasani MK, Dhar JM, Al-Sulaiman MOHAMMED (1991) Effect of diet during Ramadan on patients on chronic haemodialysis.
7. Al Wakeel JS (2014) Kidney function and metabolic profile of chronic kidney disease and hemodialysis patients during Ramadan fasting. *Iranian J Kidney Dis* 8.
8. Adanan NIH, Ali MSM, Lim JH, Zakaria NF, Lim CTS, et al. (2020). Investigating physical and nutritional changes during prolonged intermittent fasting in hemodialysis patients: a prospective cohort study. *J Ren Nutr* 30: e15-e26.
9. Leiper JB, Molla AM (2003). Effects on health of fluid restriction during fasting in Ramadan. *Eur J Clin Nutr* 57: S30-S38.
10. Khazneh E, Qaddumi J, Hamdan Z, Qudaimat F, Sbitany A, et al. (2019). The effects of Ramadan fasting on clinical and biochemical markers among hemodialysis patients: A prospective cohort study. *PLoS one* 14: e0218745.
11. Bernieh B, Al Hakim MR, Boobes Y, Zidan FMA (2010) Fasting Ramadan in chronic kidney disease patients: clinical and biochemical effects. *Saudi J Kidney Dis Transplant* 21: 898-902.