

Prevalence, Clinique Aspect and Evolution of Uremic Pericarditis in Chronic Hemodialysis Patients at the Donka National Hemodialysis Center

Soriba Bangoura*, Moussa Traore, Mohamed Lamine Tegui Camara, Aly Traore, Fatoumata Kaba, Amadou Yaya Diallo, Kadiatou Mamadou Bobo Barry, Ibrahima Cherif, Mamadouba Camara, Abou Tolno, Mohamed Lamine Kaba, Alpha Oumar Bah

Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University, Conakry, Guinea

Email: *docteurbangus@gmail.com

How to cite this paper: Bangoura, S., Traore, M., Camara, M.L.T., Traore, A., Kaba, F., Diallo, A.Y., Barry, K.M.B., Cherif, I., Camara, M., Tolno, A., Kaba, M.L. and Bah, A.O. (2024) Prevalence, Clinique Aspect and Evolution of Uremic Pericarditis in Chronic Hemodialysis Patients at the Donka National Hemodialysis Center. *Open Journal of Nephrology*, **14**, 529-537.

<https://doi.org/10.4236/ojneph.2024.144047>

Received: October 6, 2024

Accepted: November 24, 2024

Published: November 27, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Uremic pericarditis is a major complication of renal disease, occurring in patients with chronic renal failure, prior to dialysis or during dialysis treatment. Our aim was to determine the prevalence and clinique aspect of uremic pericarditis in our center. **Material and Methods:** This was a dynamic descriptive study covering the period from August 1 to March 30, 2022. Recruitment was exhaustive of all chronic hemodialysis patients over three months of age, and only those presenting with uremic pericarditis after our means of investigation were included in the study. The sample size was obtained after counting and showed a total of 47 patients with uremic pericarditis. Data were entered and analyzed in SPSS v21. **Results:** The prevalence of uremic pericarditis in this study was 17.54%; the mean age of patients was 34.42 ± 12.38 years; vascular nephropathy accounted for 57.45% of cases; clinical signs were dominated by pericardial friction (91.50%) and liquid pericarditis (89.36%); more than half of patients (93.62%) received two hemodialysis sessions per week. Late discovery of CKD was 74.47%. The mortality rate in this study was 34.04%. There was no statistically significant association between late onset of CKD and uremic pericarditis (p -value = 0.59). **Conclusion:** Late diagnosis of CKD is often accompanied by serious complications, including uremic pericarditis, which is responsible for early morbidity and mortality in new hemodialysis patients.

Keywords

Pericarditis, Hemodialysis, Donka

1. Introduction

Pericarditis refers to inflammatory conditions of the pericardium of multiple etiologies [1]. Uremic pericarditis is essentially a complication of end-stage chronic renal failure, prior to or within eight weeks of initiation of extrarenal renal replacement therapy [1]. It is the consequence of several factors, including poor vascular access and insufficient dialysis dose [2]. Its actual incidence is difficult to assess; diagnosis is based on clinical and ultrasound findings.

The prevalence of uremic pericarditis remains high in low-income countries due to delayed diagnosis and management of CKD. Uremic pericarditis is a relatively frequent but serious complication of CKD. Uremic pericarditis must be rapidly diagnosed and immediately managed to ensure a favorable outcome [3] [4].

In Cameroon, its prevalence was 62% in patients with severe chronic renal failure [5].

Its hospital prevalence was 31.6% in Burkina Faso and 29.70% in Mali in 2005 [6] [7].

In France, pericarditis in end-stage renal failure patients accounts for 5% of all dialysis patients [8].

The aim of this study was to determine the prognosis of uremic pericarditis in chronic hemodialysis patients at our center.

2. Material and Method

This was a descriptive, cross-sectional study covering the period from August 1 to March 30, 2022. It was carried out in the Nephrology and Hemodialysis Department of the Donka National Hospital; recruitment was exhaustive of all hemodialysis patients, and those presenting with uremic pericarditis after our means of investigation were included in the study.

The study variables were epidemiological, clinical and evolutionary. The main sources of data were patients' medical records and information collected on the survey form.

The descriptive study was carried out by calculating frequencies and proportions for qualitative variables, and means and standard deviations for quantitative values.

The analytical study was carried out using cross-tabulations, and comparisons were made using the χ^2 test or the FISHER test when the calculated number of subjects was small. The difference was considered statistically significant when $P < 0.05$.

Uremic pericarditis was considered in the presence of impaired renal function with creatinine clearance below 15 ml/min calculated by the original MDRD; the presence of pericarditis friction on cardiac auscultation and/or cardiac echodoppler demonstrating pericarditis with the absence of fibrin deposition.

The criteria for chronic renal failure were based on the clinical arguments defined in the literature: a history of renal impairment lasting at least three months, marked by elevated creatinine, persistent proteinuria, hematuria or leukocyturia in the

absence of any urinary tract infection; the existence of a congenital morphological anomaly.

Hypocalcemia is associated with a drop in vitamin D3.

Small kidneys on ultrasound, except in diabetics and patients with HIV. Poor preservation of cortico-medullary or cortico-sinusal differentiation.

Only hemodialysis patients aged over three months were included in this study.

Patients undergoing hemodialysis for AKI or for less than 3 months, those with a history of pericarditis of any etiology prior to diagnosis of end-stage renal disease, and those diagnosed with extra-pulmonary tuberculosis or a severe infectious condition were not included in this study.

3. Results

In this study, out of a total of 268 chronic hemodialysis patients, the frequency of uremic pericarditis was 17.54% (**Figure 1**).

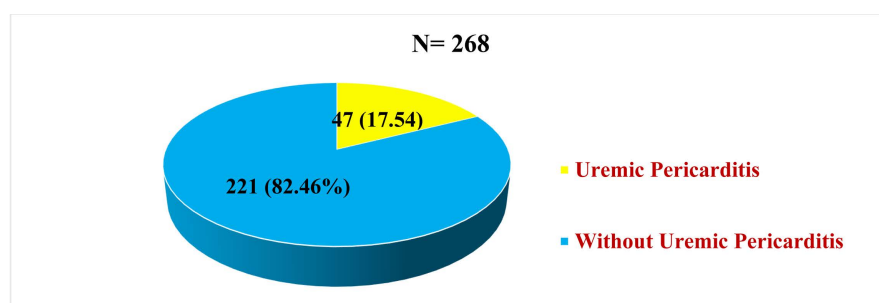


Figure 1. Frequency of uremic pericarditis in hemodialysis patients at Donka.

The mean age of patients was 34.42 ± 12.38 years, with extremes ranging from 12 to 72 years (**Table 1**).

Table 1. Age distribution of chronic hemodialysis patients with uremic pericarditis.

Age ranges	Workforce	Percentage (%)
10 - 19	6	12.77
20 - 29	8	17.02
30 - 39	13	27.66
40 - 49	8	17.02
50 - 59	5	10.64
>60	7	14.89
Total	47	100

Mean age: 34.42 ± 12.38 years, Extreme: from 12 to 76 years.

Males predominated, with a sex ratio of 1.61 (**Figure 2**).

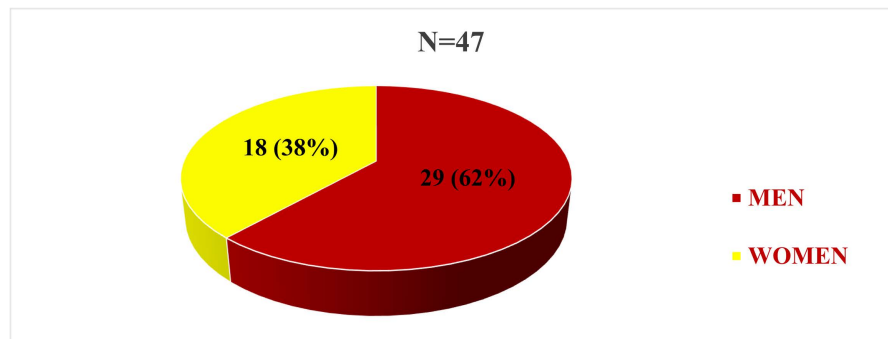


Figure 2. Distribution of chronic hemodialysis patients with uremic pericarditis by sex, Sex-ratio= 1.61.

Vascular nephropathy accounted for more than half, i.e., 57.45% (**Table 2**).

Table 2. Distribution of chronic hemodialysis patients with uremic pericarditis by type of nephropathy.

Types of Nephropathy	Workforce	Percentages (%)
Vascular nephropathy	27	57.45
Glomerular nephropathy	8	17.02
Diabetic nephropathy	6	12.77
Mixed nephropathies	4	8.51
Chronic Tubulointerstitial Nephropathy	2	4.25
Total	47	100

*FO demonstrating lesions of hypertensive and diabetic retinopathy.

Clinical signs were dominated by pericarditis friction, chest pain and dyspnoea, respectively 91.50%, 87.23% and 78.72% (**Table 3**).

Table 3. Distribution of chronic hemodialysis patients with uremic pericarditis according to clinical signs observed.

Clinical Signs	Workforce	Percentage (%)	
Functional signs	Chest pain	41	87.23
	Dyspnea	37	78.72
	Cough	22	46.81
Physical signs	Friction Pericarditis	43	91.50
	IMO	33	70.21
	Turgid jugular veins	14	29.79
	Ascites	14	29.79
	Systolic Breath	12	25.53
	Pleuresis	10	21.28

Cardiac echodoppler findings were dominated by medium-abundance pericarditis (57.45%) (**Table 4**).

Table 4. Distribution of chronic hemodialysis patients with uremic pericarditis according to cardiac echodoppler appearance.

Cardiac Ultrasound	Workforce	Percentage (%)
Low abundance liquid pericarditis	5	10.64
Medium-abundance liquid pericarditis	27	57.45
Grande Abondance liquid pericarditis without signs of tamponade	8	17.02
Liquid pericarditis of great abundance with signs of tamponade	2	4.25
Pericarditis sicca (thickening, calcification)	5	10.64
Total	47	100

More than half of chronic hemodialysis patients (93.62%) received two hemodialysis sessions per week (Text 1).

Late discovery of CKD was found in 74.47% of cases (Text 2).

The mortality rate in this study was 34.04% (Text 3).

Text 1: Distribution of chronic hemodialysis patients with uremic pericarditis by number of hemodialysis sessions

More than half of patients received two hemodialysis sessions per week, 44 cases, i.e. a prevalence of 93.62%. Only 3 patients received 3 hemodialysis sessions per week, i.e. 6.38%.

Text 2: Distribution of chronic hemodialysis patients presenting with uremic pericarditis according to circumstances of discovery

Late discovery of chronic end-stage renal disease with complications requiring emergency hemodialysis was found in 35 patients (74.47%); known CKD patients with irregular follow-up accounted for 12 cases (prevalence 25.53%).

Text 3: Distribution of chronic hemodialysis patients with uremic pericarditis according to evolution after treatment with drainage and hemodialysis:

The outcome was favorable for 31 patients, i.e. a frequency of 65.96%, mortality was 16 cases, i.e. 34.04%.

4. Discussion

Few studies have been carried out on uremic pericarditis; the frequency remains high in most countries where the means of extra-renal purification remain less developed and insufficient. This series found a frequency of 17.54% in a total of 268 patients. Aloui *et al.* in Tunisia found a frequency of 7.9% in 2015 [9]; EZ-ZIANI *et al.* in Morocco reported a frequency of 6% [10]; Masson *et al.* in France found 9.25% of uremic pericarditis [11], Bako in Mali reported a frequency of

16.18% [6].

The under-50s remain the most affected, with a frequency of 56.95% and an average age of 34.42 ± 12.38 years, ranging from 12 to 76 years; the 30-39 age group was the most affected, at 27.66%. Aloui *et al.* in Tunisia found a mean age of 38.3 years [9]; LAZREG *et al.* in Morocco found a mean age of 42 ± 13 years, with extremes from 16 to 77 years [4]; YANDRAPALLI *et al.* found a mean age of 55 years [12].

Unlike European countries, where the population is ageing, the African population remains young, which could explain why this age group has reached such a high level.

The sex ratio was 1.61 in this study, with males predominating; this result is comparable to that of Aloui *et al.* in Tunisia, who found a sex ratio of 3.5 in favor of males [10]. These data are contrary to that found by BENERJEE *et al.* in London, where the female sex was predominant - the M/F sex ratio was 0.67 [13].

Men are more exposed to cardiovascular risk factors than women before the age of 65 [14].

Vascular Nephropathy was found in 57.45%, followed by Glomerular Nephropathy 17.77%; LAZREG *et al.* in Rabat and Amor in Tunisia reported that initial Nephropathy was dominated by Glomerular and Interstitial Nephropathy [4] [15].

Clinical signs were dominated by pericardial friction, chest pain and dyspnea in over half the patients observed; the predominance of these signs in pericarditis has been reported in several studies [4] [16]-[18].

Liquid pericardium was the most common finding on cardiac Doppler ultrasonography, with 57.45% of fluid effusion of moderate size and 21.27% of great size, including 4.25% with signs of tamponade.

LAZREG *et al.* had found in a total of 9 patients with uremic pericarditis on cardiac echodoppler 5 cases of pericarditis of great abundance, including 3 cases with signs of tamponade and 2 cases of moderate abundance [4].

Nearly all patients (93.62%) received two hemodialysis sessions a week. As the Donka National Hemodialysis Center is currently the only public center in the country with a population of over 10 million, two dialysis sessions a week remained the only alternative for managing the influx of end-stage chronic renal failure patients, whose numbers are increasing every year.

Late discovery of chronic end-stage renal disease with complications requiring emergency hemodialysis was found in 35 patients (74.47%); known CKD patients with irregular follow-up accounted for 12 cases (25.53%). Hemodialysis treatment required the agreement of the patient and his family, accommodation in the capital or a short distance from it, and the ability to pay for medical examinations and prescriptions, due to the lack of health insurance for these patients. Certain constraints constituted real obstacles to the care of these uremic patients.

Progression was favorable in 65.96%; mortality was 34.04%. LAZREG *et al.* in Morocco found a favorable outcome in 77.78% and a mortality rate of 22.22% [4].

To reduce the frequency, morbidity and mortality associated with uremic pericarditis, it is important to improve the quality of dialysis for patients: increase the number of dialysis sessions, reduce the influx of patients by creating other dialysis units in the various communes of the capital and in the country's different administrative regions. Early detection of kidney disease by training general practitioners, and early dialysis treatment for patients with end-stage chronic kidney disease.

Study limitations: This study was limited by a lack of in-depth investigative resources for etiological research, and an insufficient sample size for proper analysis.

5. Conclusion

Studies on uremic pericarditis are still poorly described in the literature; its frequency remains high in countries where purification techniques are less developed and insufficient. Uremic pericarditis is a complication that occurs in patients suffering from chronic renal failure at a very advanced stage, and its morbidity remains high. It is clearly declining in developed countries or in patients diagnosed early with better follow-up. Reducing the frequency and morbidity of this uremic complication remains an objective and a challenge for hemodialysis centers; improving the quality of dialysis remains a better option for achieving this goal.

Declaration of Informed Consent

All authors appearing in this article share and accept equally the publication of this article in your journal.

Conflicts of Interest

The authors declare that there were no conflicts of interest in the preparation of this article.

References

- [1] Boullit, C. (2022) Uremic Pericarditis: Clinical Presentation, Risk Factors and Prognosis. *Nephrology & Therapeutics*, **18**, 232-233.
- [2] Hajji, M., Kheder, R., Smaoui, W., Jebali, H., Beji, S., Krid, M., *et al.* (2015) Péricardite urémique en hémodialyse: Prévalence et facteurs prédictifs. *Néphrologie & Thérapeutique*, **11**, 291-292. <https://doi.org/10.1016/j.nephro.2015.07.078>
- [3] Boullit, C. (2022) La péricardite urémique: Présentation clinique, facteurs de risque et pronostic. *Néphrologie & Thérapeutique*, **18**, 432-433. <https://doi.org/10.1016/j.nephro.2022.07.089>
- [4] Lazreg, Y., Alaoui, F., Hamdi, F., Alaoui, S., Boutaleb, R., El Hebil, M., *et al.* (2016) Prévalence de la péricardite urémique. *Néphrologie & Thérapeutique*, **12**, 315. <https://doi.org/10.1016/j.nephro.2016.07.069>
- [5] Youmbissi, T.J., Kingues, S., Djoumessi, S., Guemthene, M., Tchemy, C. and Mpay, L. (1996) Ultra-Sound Evaluation of 27 Patients with Chronic Renal Failure. *Cardiologie Tropicale*, **87**, 22.

- [6] Bako, B. (2006) Apport de l'échographie dans le diagnostic de la péricardite urémique. Ph.D. Thesis, University of Bamako (FMPOS).
- [7] Lengani, A., Gerard, C., Maurice, L. and Paul, Z. (1997) Epidemiology of Severe Chronic Renal Failure in Burkina. *Cahiers de Santé*, **7**, 379-383.
- [8] Dussol, B. (2005) Chronic Renal Failure. *La Revue du Praticien*, **55**, 1823-1839.
- [9] Aloui, A., Chargui, S., Ladhari, N., Younsi, F. and Ben Abdallah, T. (2016) Pericarditis during End-Stage Renal Disease. *Nephrology & Therapeutics*, **12**, 288-332.
- [10] Ezziani, M., Najdi, A., Mikou, S., Elhassani, A., Akriche, M.A., Hanin, H., et al. (2014) Anomalies échocardiographiques chez l'hémodialysé chronique: prévalence et facteurs de risque. *Pan African Medical Journal*, **18**, Article No. 216.
<https://doi.org/10.11604/pamj.2014.18.216.4438>
- [11] Masson, J., Maes, M. and Zilberman, C. (1981) Les péricardites des insuffisants rénaux chroniques traités par hémodialyse périodique. *La Revue de Médecine Interne*, **2**, 447-453. [https://doi.org/10.1016/s0248-8663\(81\)80054-9](https://doi.org/10.1016/s0248-8663(81)80054-9)
- [12] Yandrapalli, S., Andries, G., Anugu, V.R., Solangi, Z., Tariq, S., Mondal, P., et al. (2017) Prevalence and In-Hospital Outcomes of Uremic and Dialysis Pericarditis: A United States National Study. *Journal of the American College of Cardiology*, **69**, 1743. [https://doi.org/10.1016/s0735-1097\(17\)35132-x](https://doi.org/10.1016/s0735-1097(17)35132-x)
- [13] Banerjee, A. and Davenport, A. (2006) Changing Patterns of Pericardial Disease in Patients with End-Stage Renal Disease. *Hemodialysis International*, **10**, 249-255. <https://doi.org/10.1111/j.1542-4758.2006.00104.x>
- [14] Société Française de Cardiologie: Chapter 2-Item 222: Cardiovascular Risk Factors and Prevention. <https://www.sfcadio.fr>
- [15] Amor, S., Zellama, D., Safa, N., Abdellaoui, I., Bellasfer, L., Guedri, Y., et al. (2015) Description des anomalies échocardiographiques retrouvées chez des patients en hémodialyse chronique. *Néphrologie & Thérapeutique*, **11**, 291. <https://doi.org/10.1016/j.nephro.2015.07.077>
- [16] Morin, J.E., Hollomby, D., Gonda, A., Long, R. and Dobell, A.R.C. (1976) Management of Uremic Pericarditis: A Report of 11 Patients with Cardiac Tamponade and a Review of the Literature. *The Annals of Thoracic Surgery*, **22**, 588-592. [https://doi.org/10.1016/s0003-4975\(10\)64478-5](https://doi.org/10.1016/s0003-4975(10)64478-5)
- [17] Alpert, M.A. and Ravenscraft, M.D. (2003) Pericardial Involvement in End-Stage Renal Disease. *The American Journal of the Medical Sciences*, **325**, 228-236. <https://doi.org/10.1097/0000441-200304000-00009>
- [18] Rehman, K.A., Betancor, J., Xu, B., Kumar, A., Rivas, C.G., Sato, K., et al. (2017) Uremic Pericarditis, Pericardial Effusion, and Constrictive Pericarditis in End-Stage Renal Disease: Insights and Pathophysiology. *Clinical Cardiology*, **40**, 839-846. <https://doi.org/10.1002/clc.22770>

Abbreviation

ARF	Acute Renal Failure
CKD	Chronic Renal Failure
CKD	Chronic End-stage Renal Failure
FO	Fond d'œil
MDRD	Modification of Diet in Renal Disease
OMI	Oedema of the Lower Limbs
IDAW	Interdialytic Weight Gain
HIV	Human Immunodeficiency Virus