

Epidemiological, Clinical, Therapeutic, and Evolutionary Aspects of Chronic End-Stage Renal Failure in the Nephrology Department of the University Hospital of Brazzaville in 2023

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Abstract

Objective: Chronic end-stage renal failure is a major public health problem in developing countries and is poorly documented. The objective of this study was to describe the epidemiological, diagnostic, therapeutic, and evolutionary aspects of patients admitted for end-stage renal failure to the Department of Nephrology at the University Hospital of Brazzaville. **Patients and Methods:** This was a descriptive cross-sectional study collecting prospective data that took place over 10 months. We included 128 patients who were exhaustively identified. Sociodemographic, clinical, therapeutic and developmental data were collected using a standardized and pretested pre-established survey form. The EPI info software enabled the analysis and processing of the data. **Results:** We reported a male predominance with a sex ratio of 2.5. The median age was 50 years. The first cause found was diabetes (55%) followed by hypertension (46%). The majority of patients had a dialysis emergency and half could not be dialyzed for financial reasons. **Conclusion:** Our results highlighted that certain epidemiological parameters of end-stage renal failure are constantly changing, such as frequency, while others remain static, including the main etiologies, gender, and age. However, mortality continues to increase and deserves more attention.

Keywords

ESRD, Epidemiology, Nephrology, University Hospital of Brazzaville

1. Introduction

Chronic kidney failure (CKD) is defined as a set of abnormalities in kidney structure or function present for more than three months [1]. It is called a terminal when the glomerular filtration rate is less than 15 ml/min/1.73m² [1]. End-stage chronic kidney disease (ESRD) is a real scourge in the world. The incidence of end-stage kidney disease is anticipated to significantly increase in the coming decades, primarily due to the aging population and a growing prevalence of diabetes and hypertension. This demographic shift is expected to be more pronounced in developing countries rather than developed ones, posing economic challenges for many nations in delivering renal replacement therapy to a growing population of individuals with end-stage kidney disease. In 2015, it was estimated that around 2.6 million people worldwide had ESRD and that more than 2.2 million patients may have died due to a lack of access to replacement therapy [2]. In 2021 in Brazzaville, end-stage chronic renal failure represented 72.5% of cases of chronic renal failure, with an overall annual cost of dialysis treatment estimated at 7,569,600 CFA Francs average per person or 12581.685 USD [3] [4].

Many patients arrive at the hospital straight away at this terminal stage of the disease. This could be partly explained by late consultation, the low socio-economic level of the population and the insufficient number of nephrologists. The high cost of treatments, ineffective health policies, and insufficient technical support in public hospital structures could contribute to the morbidity and mortality of the disease.

To better understand the main areas of management of ESRD in the Republic of Congo, we set ourselves the objective of describing the epidemiological, diagnostic, therapeutic, and evolutionary profile of end-stage chronic renal failure in Brazzaville.

2. Patients and Method

This was a descriptive cross-sectional study carried out in the Nephrology department of the Brazzaville University Hospital (Republic of Congo) from January 1, 2023 to October 30, 2023, *i.e.*, a duration of 10 months.

The diagnosis of ESRD was made according to the Kidney Disease Improving Global Outcomes (KDIGO) criteria [1]. The glomerular filtration rate (GFR) was calculated according to the MDRD (Modification of diet in renal disease) formula, which allowed us to stage the disease according to the KDIGO [1].

In view of the preceding elements, we included in the study adults of both sexes with or without a history of kidney disease whose diagnosis of ESRD was made during the study period.

We excluded all patients with a GFR greater than 15 ml/min/1.73m² at least three months after inclusion in the study.

The parameters studied were age, sex, professional status, socioeconomic level, the probable cause of ESRD, comorbidities, circumstances of the discovery of

the disease, GFR, therapeutic attitude, and evolution.

We used Epi info 7.1 software to create the database and statistical analyses.

3. Results

During the study period, 286 CKD patients were hospitalized, and 128 presented with CKD, representing a frequency of 44.75%. The study population consisted of 91 (71.1%) men and 37 (28.9%) women, *i.e.* a sex ratio of 2.5.

The median age was 50 years with extremes of 21 and 81 years. Patients under 60 years old were the most represented.

Table 1 shows the distribution of patients by age group.

Unemployed patients were the most represented. The socio-economic level was low in 70.3%, medium in 26.6% and high in 3.1%.

Figure 1 shows the distribution of patients according to professional status.

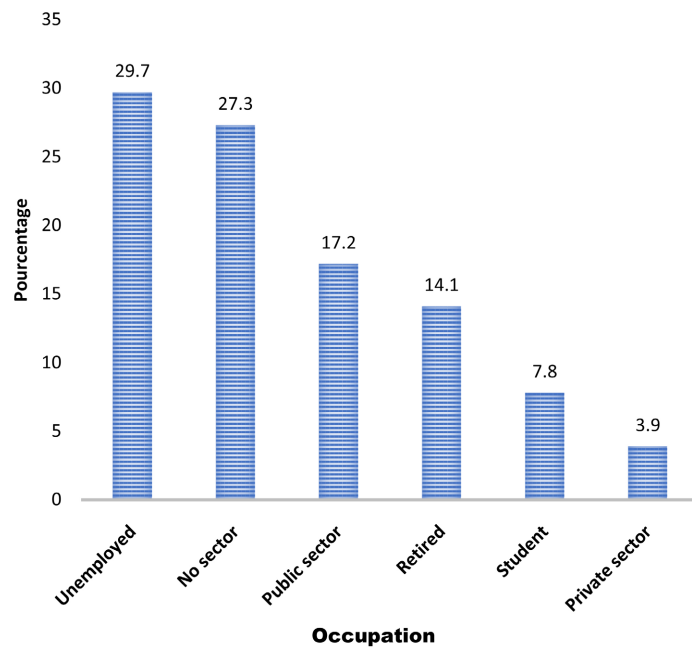


Figure 1. Distribution of patients according to professional status.

Table 1. Distribution of patients by age groups (in years).

| Variables | Effective | Percentage (%) |
|-------------------|------------|----------------|
| Age groups | | |
| <30 | 13 | 10.2 |
| 30 - 39 | 14 | 10.9 |
| 40 - 49 | 30 | 23.4 |
| 50 - 59 | 28 | 21.9 |
| ≥60 | 43 | 33.6 |
| Total | 128 | 100 |

The uremic syndrome was the most frequent discovery circumstance in 68% followed by pulmonary edema (34.4%), edematous syndrome (23.4%), and anemia (1.6%). **Figure 2** presents the distribution of patients according to the circumstances of the discovery of CKD.

Diabetes and high blood pressure were respectively the leading causes of end-stage chronic renal failure.

Figure 3 illustrates the different etiologies of ESRD during our study.

Conditions found in our study population with ESRD were hypertension, diabetes HIV, benign prostatic hypertrophy, prostate cancer, and heart disease. **Table 2** summarizes all the comorbidities found in the study population.

The distribution of patients according to GFR is presented in **Figure 4**. Overall, 37% of participants had GFR lower than 5 mL/min, 34% had GFR 10 - 14 mL/min, 29% had GFR 5 - 9 mL/min.

All patients had an indication for dialysis, among whom 78% had a dialysis emergency. Some patients had several indications for dialysis at the same time. Sixty-five patients (50.8%) in total were able to be dialyzed compared to 63 (49.2%) who could not for financial reasons. The distribution of patients according to dialysis emergency is shown in the **Table 3** below.

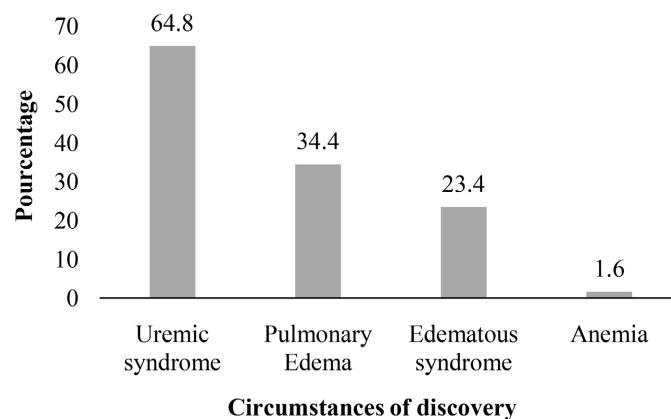


Figure 2. Distribution of patients according to overdraft circumstances.

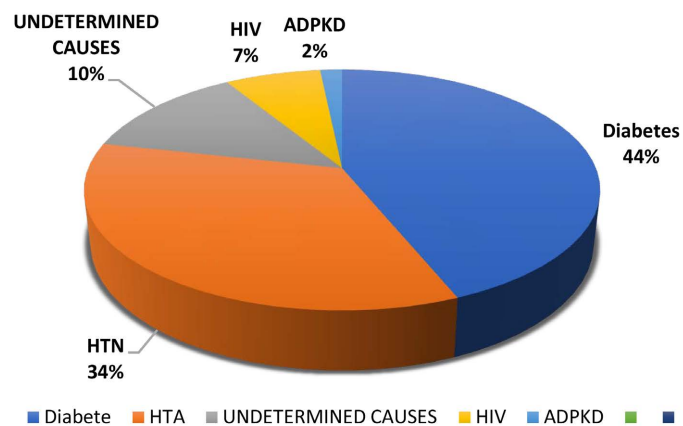


Figure 3. Distribution of patients according to etiologies.

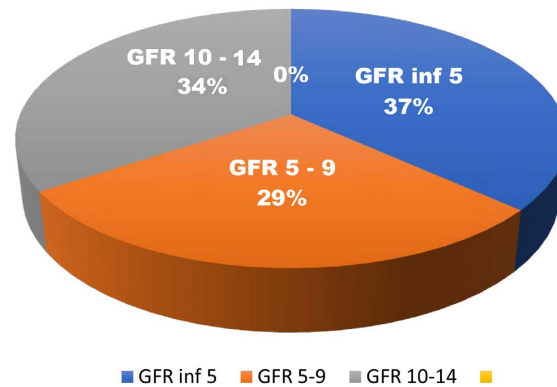


Figure 4. Distribution of patients according to GFR.

Table 2. Distribution of patients according to comorbidities.

| Variables | Effective | Percentage (%) |
|-------------------------------------|------------|----------------|
| Comorbidities | | |
| HTN | 70 | 54.7 |
| Diabetes | 55 | 43 |
| HIV | 9 | 7 |
| Benign prostatic hypertrophy | 5 | 3.9 |
| Prostate cancer | 4 | 3.1 |
| Heart disease | 2 | 1.6 |
| Chronic smoking | 2 | 1.6 |
| Total | 128 | 100 |

Table 3. Distribution of patients according to comorbidities.

| Variables | Effective | Percentage (%) |
|-----------------------------|-----------|----------------|
| Dialysis emergencies | | |
| Uremic syndrome | 83 | 64.8 |
| Threatening hyperkalemia | 30 | 23.4 |
| Severe metabolic acidosis | 39 | 30.46 |
| Acute pulmonary edema | 44 | 34.4 |

During our work, 83 patients died, giving a specific mortality rate of 64.8%.

4. Discussion

The enthusiasm surrounding chronic end-stage renal failure is not trivial. Its epidemiology is constantly in flux, varying from one country to another or from one period to another. The nephrology and dialysis department of the University Hospital of Brazzaville was chosen as the location of the study because it is the only department specialized in the management of kidney diseases in the entire city of Brazzaville.

The frequency of ESRD in our study is far from that reported by EYENI *et al.* in 2021, thus explaining the periodic epidemiological variabilities of the pathology, even within the same region [3].

The male predominance of the disease is a frequent phenomenon, it is comparable to that of Eyeni and Mahoungou in 2021 who found a sex ratio of 1.6 and 2.13 respectively [3] [5]. Male predominance is an epidemiological constant found in other African studies [6] [7] [8] [9].

The median age in our study was 50 years. Patients under 60 years old were the most represented, with a proportion of 66.4%. Bourhaima *et al.* in Treichville noted an average age of 44 year [10]. Kaba *et al.* in 2015 reported a median age of 44 years in Conakry [11]. Yawovi Mawufemo *et al.* in 2020 in Lomé found a median age of 49 year [12].

It is therefore a pathology of young adults, reflecting the population of Africa which is predominantly young. Contrary to African data, in developed countries CKD is a pathology of the elderly. In 2017 in France, the average age of patients treated for ESRD was 70.5 years [13]. This can be explained by the fact that in the West disease prevention policies are effective, thus delaying the arrival at the terminal stage.

The leading cause of ESRD in our study was diabetes (55%) followed by hypertension (46%). These results are similar to those of Eyeni *et al.* in 2021 in Congo [3]. Diabetes is a scourge in the Republic of Congo, its constantly increasing prevalence would explain the fact that it is the leading cause of ESRD in our context. These results are similar to those of Middle Eastern countries [14].

ESRD was mainly discovered in a dialytic emergency context which could be explained by the diagnostic delay in our countries. The uremic syndrome (64.8%) followed by OAP (34.4%) were the main emergencies. These results are similar to those reported by MAHOUNGOU *et al.* with uremic syndrome and PAO as the two main dialysis emergency [5]. Our results are also superimposable to those found by DIAWARA *et al.* in Senegal in 2020 and KONAN *et al.* in Ivory Coast in 2021 in whom poorly tolerated uremia was also the main indication for hemodialysis [15] [16].

Only 50.8% of patients had benefited from replacement treatment by hemodialysis for financial reasons. In Brazzaville, there are no hemodialysis units in the public sector. All the centers listed in this city are all private, with an average cost of the hemodialysis session estimated at 165,800 CFA Francs (270 US Dollars) [17]. The only public center in Congo is located in the town of Oyo, nearly 400 km from Brazzaville.

Eighty-three patients died, giving a case fatality rate of 64.8%. Our results are among the highest in Africa, some African series have results far from ours [9] [11] [13] [18] [19] [20] [21]. The exorbitant cost of care, the low socio-economic level of the population and ineffective health policies could explain this mortality.

The monocentric nature of our work was a limitation for our work because it did not allow us to extrapolate our data to a national scale.

5. Conclusion

The problems that undermine the management of ESRD in the Republic of Congo remain the same. The frequency of this pathology remains variable, young adults are the most affected with a male predominance. Patients with a low socio-economic level were the most represented. Diabetes and hypertension are the main causes. The majority of patients needed emergency dialysis. Inaccessibility to hemodialysis was encountered in almost half of the study population, which contributed to high mortality.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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