# *Original Research Article*

**Epidemiological, clinical and evolutionary profiles of patients admitted in a dialytic emergency situation at the University Hospital of Brazzaville**


**Abstract**

**Introduction:** Emergency dialyses often require some timely extrarenal purification procedures. In addition, the vital and functional prognosis could be jeopardized.

Objective of this study was to study the epidemiological, etiological and prognostic aspects of emergency dialysis at the University Hospital of Brazzaville.

**Patients and methods:** We conducted a cross-sectional, descriptive and analytical study, with prospective data collection, over a period of one year (from September 01, 2019 to August 30, 2020), carried out at the University Hospital of Brazzaville. Patients of any age with acute or chronic renal failure requiring emergency dialysis for the first time were included.

**Results:** The incidence of emergency dialyses was 31.33%. The average age was 48 ± 17 years. Men were the most represented in this study with 64 cases (68%) and the female sex 30 cases (32%) for a sex ratio was 2.13. Acute renal failure (ARF) was the predominant type of renal failure in 61 patients (64.89%) with the most common etiology being acute tubular necrosis in 16 patients (17.1%). Chronic renal failure (CRF) was found in 33 patients (35.11%). The most common indications for emergency hemodialysis were major uremic syndrome in 48 patients (51.07%) followed by acute pulmonary edema in 21 patients (22.34%). An extrarenal purification therapy was done in emergency in 46 patients admitted in the department of nephrology, i.e. 48.94%. The procedure of choice was intermittent hemodialysis with a synthetic membrane. The mean duration of the first hemodialysis session was 3 hours ± 49 minutes and an average ultrafiltration of 1106 ± 759 ml in 28 patients. The other patients had dialysis without ultrafiltration. The vascular access was exclusively a femoral catheter. An anticoagulant was used in 37 patients each dialyses, ie 80.34%. Eight patients (17.39%) had died on post dialysis. On the other hand, for ARF, renal function recovery was complete in 39.13% of cases, partial in 17.39%. 17.39% of CRF patients had a favorable course and 8.7% a course to CRF. The univariate analysis showed diabetes, hypertension, underlying nephropathy, heart disease, and type of renal failure are risk factors for unfavorable development and mortality.

**Conclusion:** In the Republic of Congo, patients are generally admitted in late stages of renal failure which, moreover, aggravates the already difficulty of access to an eventual extrarenal purification therapy and increases cases of emergency dialyses with a significant morbidity and mortality.



**Keywords:** Emergency dialysis, Renal failure, Brazzaville

## I- Introduction

Emergency dialysisare very common in nephrology [1]. They are responsible for high morbidity and poor prognosis in patient with renal failure in a more or less short period requiring rapid and adequate management [2]. They must be diagnosed and treated as quickly as possible because they can be life-threatening [1]. The initiation of dialysis in emergency presentations is an indication of how severe the disease is and how complex its management is.

The prevalence of emergency dialysis varies widely in the literature. Some hospital studies in France reported frequencies of 30.30% in 2012 [3] and 40.68% in 2019 at the regional hemodialysis center of Thiès, Senegal [4].

There are indications for which it is essential to start dialysis without delay, when a patient has a sudden drop in GFR or when he/she develops clinically significant electrolyte disturbances or uremic complications [5]. These so-called "absolute" indications have been described by Gibney N et al and are generally well accepted by all teams [6]; These are: threatening hyperkalaemia, acute pulmonary edema refractory to diuretics, deep metabolic acidosis, anuria lasting more than 24 hours and uremic complications (pericardial tamponade, digestive bleeding, neurological disorders). In an emergency, the preferred type of extrarenal treatment is hemodialysis [7].

Severe renal failure is a real public health problem in countries with limited resources because of its prevalence and the complications it causes. In Congo, several problems are encountered in the optimal management of patients with renal insufficiency. These include mainly: the very limited number of nephrologists, the delay in referral of patients to nephrologists, the limited technical platform, the lack of a kidney disease prevention policy and the high cost of a dialysis session in a private sector.

These patients are then exposed to complications which, in the absence of urgent treatment, can turn out to be dramatic. Dialysis therefore becomes an opportunity for survival for these patients. Unfortunately, no public hospital in Brazzaville has a dialysis unit, thus compromising their functional and/or vital prognosis.

In order to better understand on the one hand, the major problems encountered in the care of patients with renal failure and on the other hand to contribute to improving the quality of care by identifying patients at risk, the adoption of preventive measures, and the optimization of the therapeutic protocols of these patients, we carried out this study, the general objective of which is to study the epidemiological, etiological and prognostic aspects of emergency dialysis at the University Hospital of Brazzaville.

## II- Patients and Method

This was a cross-sectional and descriptive and analytical study on a consecutive series of patients hospitalized from September 01, 2019 to August 30, 2020 in the Nephrology department of the University Hospital of Brazzaville. This department is the only one dedicated exclusively to specialized nephrology care in the entire capital city, however it does not have a hemodialysis unit. The city of Brazzaville has 2 private medical centers with hemodialysis units. The average cost of a dialysis session is 95,000 CFA Franc, or the equivalent of 140 Euro.

All patients with acute or chronic renal failure, presenting a emergency dialysis on admission, were included.

ARF was defined as deterioration of renal function (serum creatinine> 240 µmol / L) during acute disease in a patient with good somatic status. The higher serum creatinine values were used to determine the severity of acute renal failure (ARF) and to assess the immediate functional prognosis.

In the absence of histological certainty, the chronic renal failure (CRF) was chosen on a bundle of arguments:

The dialytic emergencies were:

- Acute pulmonary edema: defined by the occurrence of dyspnea with orthopnea associated with crackling rales in the 2 pulmonary fields, in rising tide. Chest x-ray shows peri-hilar butterfly-wing opacities.

- Threatening hyperkalaemia is defined by the presence of a serum potassium greater than 7 mmol/L with an electrical sign of gravity on the electrocardiogram.

- Severe metabolic acidosis is defined by a blood bicarbonate level below 10 mmol/L.

- Poorly tolerated uremia is defined by the presence of blood urea greater than 3 g/L with clinical signs

For all patients, epidemiological data, clinics, paraclinical data, type of renal failure (RF), indications for dialysis, etiologies were collected using a survey sheet.

For patients that received hemodialysis, the hemodialysis parameters, accidents, incidents during the first session and progress were noted.

Favorable outcome was defined as return to baseline renal function and or resumption of urine output. Partial recovery was marked by the persistence of residual renal failure but no longer necessitating the use of hemodialysis.

The data were entered and analyzed by the EPI info software version 3.3.2. The differences were significant when $p < 0.05$.

**III- Results**

Of the 300 patients with renal failure admitted to the nephrology and dialysis department of the University Hospital of Brazzaville, 94 presented with an emergency dialysis, ie a frequency of 31.33%. The mean age of the patients was 48 ± 17 years (18 to 81 years). Men were the most represented in this study with 64 cases (68%) and the female sex 30 cases (32%) for a sex ratio was 2.13. The socioeconomic level was average in 57.45% of cases, low in 35.11% and high in 7.45%.

Hypertension was found in 40 patients, or 42.55%; renal disease was known before the first dialysis session in 33 patients, ie 35.51%. Diabetes was present in 29 patients, or 30.85%, and heart disease in 17 patients, or 18.09%. The surgical history was found in 5 patients, ie 5.32%.

On admission, patients presented with impaired consciousness in 30 cases (32%) and anuria in 29 cases (31%).

During the physical examination, 45 patients or 47.87% had a normal Glasgow score, 37 patients or 39.36 a Glasgow score between 9 and 14, 12 patients or 12.77 a score below 8. The pallor was noted in 80.86%. Edemas of the lower limbs were noted in 46.81%. The bladder was noted in 8.5% of cases. Anuria was noted in 28.72% of patients, oliguria in 15.96%, retention of urine output in 55.32%.

The median serum urea level was 48 mmol / L (17 to 88). The median serum creatinine level was 1575 µmol / L (792 to 3458). The serum potassium was normal in 68 patients or 72.34%, 21 patients or 22.34% had hyperkalaemia and 5 patients or 5.32% had hypokalaemia. Natremia was normal in 33 patients, ie 35.11%, decreased in 61 patients, or 64.89%. The average sodium level was 132 mmol / l with extremes ranging from 99 mmol / l to 144 mmol / l. The median serum calcium level was 2.2 mmol / L with extremes ranging from 1.6 mmol / L to 3.5 mmol / L. The median serum phosphorus level was 1.6 mmol / L with extremes ranging from 0.84 mmol / L to 2.7 mmol / L. The median hemoglobin level was 8.8 mmol / L with extremes of 3.5 dg / L and 15 dg / L. Eighty-three patients or 88.30% were anemic. On the renal and vesico-prostatic ultrasound, two patients, or 42.67%, had poor cortico-medullary differentiation.

Sixty-one patients or 64.89% presented with AFR and 33 patients or 35.11% with CRF. Chronic glomerulonephritis was present in 15 patients with chronic renal failure, ie 16%, followed by diabetic nephropathy in 9 patients, ie 9.6% (Table I).

Forty patients or 57.4% had organic renal failure. Acute tubulointerstitial nephritis (ATIN) was found in 16 patients, ie 17.1%, followed by HIV nephropathy in 10 patients, ie 11% (Table II). Obstructive ARF was found in 7.5% of patients and functional ARF in 13.8%.

Major uremic syndrome was the main indication for dialysis in 51.07% of patients, followed by refractory acute pulmonary edema (APE) 22.34%, anuria in 21.28%, metabolic acidosis in 8.51%, severe hyperkalaemia in 7.45 % of cases.

Hemodialysis parameters

Forty-six patients or 49% were on emergency dialysis and put on intermittent hemodialysis (IHD). The most commonly used approach was exclusively femoral. The average duration of the first hemodialysis session was 3 hours ± 49 minutes with a minimum of 1 hour 50 minutes and a maximum of 4 hours. The mean ultrafiltration was 1106 ± 759 ml. Hemodialysis sessions without ultrafiltration were observed in 18 of our patients. The mean dialysate temperature was 36.11 ± 0.40 ° C with a minimum of 35 ° C and a maximum of 37 ° C. The anticoagulant was used in 37 patients or 80.43%. In 21 patients, 45.64%, it was unfractionated heparin (UFH) and 16 patients, 34.78% low molecular weight heparin (LMWH). The anticoagulant was not used in 9 patients or 19.57%. The median conductivity was 138 micro-siemens / centimeter. The extremes were 134 and 148 micro-siemens / centimeter. Perdialytic incidents and accidents were as follows: arterial hypotension (26.5%), cramps (22.34%), hypoglycemia (12.78%), vomiting (10.6%), allergy (8.48%), imbalance syndrome (7.43%), psychomotor agitation (6.36%), catheter thrombophlebitis (4.24%), hemorrhage (4.24%), circuit coagulation (3.18%).

The course after 1 month of patients with ARF was marked by a total recovery of normal renal function in 18 patients, or 39.13%, and partial recovery in 8 patients, or 17.39%. Four patients (8.7%) with CRF progressed to terminal CRF after one month. The progression to death was noted in 3 patients with ARI and 5 patients with CRF, for a total of 8 patients (17.39%).

**Analytical study**

We found a significant association between unfavorable outcome and diabetes (p = 0.020), as well as between underlying nephropathy (p = 0.003), and heart disease (p = 0.014). We also found a significant association between the unfavorable outcome and the type of renal failure (p = 0.003) as reported in Table III.

The study of the link did not show a significant association between unfavorable course and age, nor between unfavorable course and sex (Table IV).

**IV- DISCUSSION**

Three hundred patients with renal faillure (acute and chronic) were admitted to the nephrology and dialysis department of the University Hospital of Brazzaville during the study period, among which 94 patients required urgent dialysis care, i.e. a hospital prevalence of 31.33 %. This frequency was higher than that of previous studies carried out by KOROMA in Côte d'Ivoire and SANE in Senegal, which found 12.2% and 23% respectively [8,9]. A higher frequency of 61% was found in a Moroccan study [10]. This high frequency in our service compared to previous studies could be explained by:

-the fact that the University Hospital of Brazzaville is the only public hospital in Brazzaville with a nephrology service and all complicated patients are referred there;

-prolonged intake of nephrotoxic drugs which impair renal function;

-the large prescription of NSAIDs by other medical specialties exposing patients to acute renal attacks;

-the multiplicity of risk factors for the onset of kidney disease;

-the low level of prevention of kidney disease.

The mean age of our patients was 48 ± 17 years with extremes of 18 years and 81 years. Our results are similar to those of DIAWARA et al [4] who found a mean age of 46.39 ± 17 years. In France in 2006, the study by Vinsonneau et al found a higher average age of 65 years [11]. The average age of patients admitted to an emergency dialysis situation varies widely in the literature [12]. In Western series, it is between 60 and 80 years against 35 to 45 years in developing countries [13]. This disparity could be explained by the aging of the population and the improvement in the level of medical care in developed countries.

Age is a major risk factor for mortality. It promotes the onset of kidney failure and increases the risk of death [14]. While in some old studies involving a limited number of patients, this prognostic role could not be found [15, 16], the series that included a large number of patients have demonstrated by univariate or multivariate analysis that the risk of death increases. with age [4, 16, 17]. While for De Mendonça et al. this risk does not appear until after 64 years [18], it has been observed that the

mortality rate increases by almost 50% per age group of 20 years (OR: 1.55; 95% CI: 1, 32–1.81, age: 45 vs. 65 years) [19]. The results of our study showed no significant association between age, unfavorable course, and risk of death. This could be explained by the small size of our study.

We noted a male predominance with a sex ratio of 2.13. Our results are comparable to those found in the literature [4,11,12]. This gender inequality could be explained by the frequency of kidney disease in men and their faster progression to CRF [20]. But also by the organization of our society where men are more exposed to risk factors for the onset of kidney disease.

Mehta et al found excess mortality in humans with an odds ratio of 2.36 [21]. In our study, mortality tended to be higher in women compared to men (Odds ratio = 1.15 CI [0.24; 5.60] p = 0.0853).

Hypertension was the most common antecedent in 40 patients, ie 42.55%. Our results are similar to those of Diawara [4]. Hypertension is a risk factor for the onset of vascular nephropathies.

We also found that 30.85% of the patients in our study were diabetic. Our results are comparable to those of Diawara [4] This result shows the role of diabetes in the development of diabetic nephropathy, also a cause of CRF.

This history is recognized as an important factor involved in the onset or worsening of CRF. The link study showed a significant relationship between unfavorable outcome and hypertension (p = 0.049), diabetes (p = 0.020), nephropathy (p = 0.003), and heart disease (p = 0.014). We also found a significant association between death, diabetes (p <0.001), and high blood pressure (p = 0.049). These results could be explained by the complications specific to these diseases. Due to chronicity, these risk factors weaken the patient's state of health, which becomes more vulnerable than a subject without a history. But also, by the lack of adequate follow-up of these patients.

In our study, we noted the notion of prolonged intake of nephrotoxic drugs in 25 patients, ie 26.60%. According to BELLOMO [22] in 2012 in the United States, drugs contributed in at least 20% of cases to the occurrence of ARF, especially in intensive care. In some developed countries in 2013, LI P et al. [23], SCHISSLER MM et al. [24] and FINLAY S et al. [25] reported frequencies between 20 and 50%. In the majority of cases, it was a polypharmacy in elderly patients with multitares. This is in line with the results of the IDRISSI Z series in Morocco [26] in 2016. The substances incriminated were mainly drugs that alter renal self-regulation. These results justify the need to strengthen the effectiveness of the national pharmacovigilance program.

The reasons for consultation were dominated by disturbances of consciousness, ie around 32%. The clinical examination revealed 52.13% of abnormalities of consciousness, ie 39.36% of obnubated patients and 12.77% of comatose patients. These results are comparable to those found by DIAWARA in Senegal [4]. This could be explained by the delay in consulting patients who for the most part present at the stage of complications, after resorting to self-medication, but also by the absence of an emergency dialysis unit within the University Hospital of Brazzaville which would make it possible to take care of these patients at an early stage upon admission in order to prevent disturbances of consciousness acquired in hospital. The results we obtained justify the need to set up an emergency dialysis unit within the University Hospital of Brazzaville. Bivariate analysis showed no significant association between disturbance of consciousness, unfavorable course (p = 0.169) and risk of risk of

death (p = 0.658). However, we found a significant relationship between unfavorable course and dyspnea (p = 0.016).

In our study, the frequency of hemodynamically unstable patients was 3.19%. This parameter has been studied by some authors as a risk factor for mortality [27]. Bivariate analysis showed a significant relationship between death and hemodynamic status (p = 0.001). This result could be explained by the fact that our patients were admitted with a severe stage of renal failure.

In our series, oligo-anuria was present in 44.68% of patients against 55% in the Vinsonneau series [11]. Some results found in the literature are comparable to ours. Lengani in Burkina Faso [12] found 58.7%. This high frequency in our series could be explained by the predominance of parenchymal etiologies in our series. Diuresis is an important prognostic factor. The occurrence of oligoanuria definitely increases the risk of death. The excess mortality if it is necessary to temporarily resort to extrarenal purification techniques is 10% [28] but can reach 20 to 26% [19]. This pejorative nature of oliguria has been demonstrated by numerous studies including a large number of patients and using logistic regression analysis [28,23,19]. Some of them allow the odds ratios or the relative risk of hospital mortality to be calculated, which vary between 1.6 [28, 18] and 2.2 [19]. We did not find a significant relationship between oligo-anuria and the risk of death (p = 1,000). However, we found an unfavorable development trend. This could be explained by the pathophysiological mechanisms of anuria which lead to the onset of salt and water overload and fluid and electrolyte disturbances thus worsening the patient's vital prognosis.

Chronic glomerulonephritis was the leading cause of CRF in our series (16%) followed by diabetic nephropathy (9.6%). Other authors have found consistent results with ours. In the DIAWARA study [7], nephroangiosclerosis was the leading cause of CRF (25.2%) followed by diabetic nephropathy (6.3%). In that of SANE [9], chronic glomerulonephritis (45.5%) and nephroangiosclerosis (26.5%) were the main causes of CRF.

Acute tubular necrosis (ACN) was the main lesion found during ARF in our series with 17.10% of all AKIs. Etiological data on Acute interstitial nephritis (AIN) are not known in Congo. In Senegal, it is the leading cause of ARF [29]. Maaroufi C, et al. in Morocco and Khellaf G, et al. in Algeria had found in their studies 12.74% and 37% [30, 31] respectively of cases of Acute interstitial nephritis (AIN). A study carried out by KOROMA found a prevalence of 13.39% of acute tubular necrosis [8]. The predominance of Acute interstitial nephritis (AIN) as the main cause of ARF is linked to a high prevalence of malaria, a high prevalence of postpartum ARF [29], as well as the uncontrolled and abusive use of nephrotoxic drugs. The results we have obtained justify the need to strengthen the fight against malaria, to supervise childbirth by quality medical personnel and to set up a program to regulate traditional pharmacopoeia.

Tubular necrosis multiplies by 3 the mortality [32] which varies from 62 to 78.6% and depends on the cause (toxic: 38%, ischemic: 60%) [33]. We did not find a significant association between AIN and unfavorable outcome (p = 0.125). However, we found a significant association between unfavorable course and type of renal failure (p = 0.003). The CRF patient was 12 times more likely to have an unfavorable outcome than the ARF patient (Odds ratio = 12.3 95% CI [2.34; 64.2] p = 0.003). This result could be explained by the fact of the chronicity which weakens the kidney, which becomes vulnerable in the event of added ARF.

In our series 18 patients (39.13%) with ARF had complete recovery of renal function and in 8 patients (17.39%) recovery was partial. These results are similar to those of DIAWARA [4] which showed 36% complete recovery of renal function and 21% partial recovery. These findings could be explained by the potential reversibility of renal function during ARF. Our results are lower than those of SANE [9] which showed 53% complete recovery of renal function and 47% partial recovery. Comparison of the recovery of renal function between studies is difficult because its definition varies from one study to another (withdrawal of dialysis, normalization of serum creatinine figures or return to baseline values) as well as the period during which this is assessed (discharge from intensive care, discharge from hospital, etc.).

Death occurred in 17.39% of the patients in our series. A similar mortality was noted in the studies of DIAWARA (17.80%) and SANE (18.5%) [4.9] but less compared to a study carried out in 2013 by Koroma M which found 25.84% [8]. This high mortality in our series could be related to the severity of the patients at the time of the initiation of dialysis and the high cost thereof, which often delays treatment. The temporary vascular accesses used are also a significant morbidity and mortality factor because they are sometimes the gateway to infections.

The cross-sectional descriptive and analytical nature of this study ensures an optimal quality of the results because the collection of information was contemporaneous with the events described. The length of the study period was defined by the need to obtain a statistically significant sample.

Limitations of the study are related to the absence of renal puncture biopsy, thus reducing the field of etiologies; and the lack of carrying out blood gases at the University Hospital of Brazzaville.

**Conclusion:** In the Republic of Congo, patients are generally admitted in late stages of renal failure which, moreover, aggravates the already difficulty of access to an eventual extrarenal purification therapy and increases cases of emergency dialyses with a significant morbidity and mortality.

## COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES


1. Dimassi Y, Zouaghi M.K, Jebali H, Smaoui W, Kheder R, Krid M et al. Hemodialysis in an emergency. Nephrology and Therapeutics 2016; 12 (5): 320

2. Saha M, Allon M. Diagnosis, treatment, and prevention of hemodialysis emergencies. Clin J Am SOC Nephrol 2017: 12 (2): 357-9

3. Vinsonneau C, Camus C, Combes A, Costa de Beauregard MA, Klouche K, Boulain T, et al. haemodialysis for acute renal failure in patients with multipleorgan dysfunction syndrome: a multicenter randomized trial. Lancet 2012; 368: 379-85

4. Diawara M, Kane Y, Cisse M.M, Lemrabott A.T, Faye M, Bop M.C, et al. Hemodialysis in Emergency Situations: A Study of 107 Cases at the Hemodialysis Center of the CHR in Thiès (Senegal). Health Sciences and Diseases March 2020: 21 (3): 49

5. Kellum J.A., Ravindra L M., Angus D.C., Palevsky P., Ronco C. for the ADQI Workgroup. The first international consensus conference on continuous renal replacement therapy. Kidney Int 2002; 62: 1853–63

6. Gibney N, Hoste E, Burdmann EA, Bunchman T, Kher V, Viswanathan R, Mehta RL, Ronco C. Clin J Am Soc Nephrol. Timing of initiation and discontinuation of renal replacement therapy in AKI: unanswered key questions 2008, 3: 876-80

7. Phu NH, Hien TT, Mai NT, Chau TT, Chuong LV, Loc PP, et al. Hemofiltration and peritoneal dialysis in infection-associated acute renal failure in Vietnam. N Engl J Med 2002; 347: 895-96.

8. Koroma M. Thesis: The indications for hemodialysis in an emergency situation in Dakar. 2013: 25.

9. Sane FG. Hemodialysis in emergency situations at the CHU Le Dantec in Dakar. Health Sci. Say 2019, (21): 25-34.

10. Bourquia A. Current status of IRC processing in Morocco. Nephrol 1999; 20: 75-80.

11. Vinsonneau C, Camus C, Combes A, Costa de Beauregard MA, Klouche K, Boulain T, et al. Continuous venovenous haemodiafiltration versus intermittent haemodialysis for acute renal failure in patients with multipleorgan dysfunction syndrome: a multicenter randomized trial. Lancet 2006; 368: 379-85.

12. Lengani A, Kargougou D, Fogazzi G.B, Laville M. Acute renal failure in Burkina Faso. nephron 2009; 07; 013

13. D. Payen, C. Berton. Acute renal failure: epidemiology, incidence and risk factors. French Annals of Anesthesia and Resuscitation. 2005; 24: 134-139

14. O'Callaghan. C.A, Vinsonneau. C, Benyamina. M. What techniques for the treatment of acute renal failure in intensive care Resuscitation 2009; 18; 397—406

15. Schaefer JH, Jochimsen F, Keller F, Wegscheider K, Distler A. Outcome of acuterenal failure in medical intensive care. Intensive Care Med 1991; 17: 19–24.

16. Chew SL, Lins RL, Daelemans R, de Broe ME. Outcome in acute renal failure. Nephrol Dial Transplant 1993; 8: 101–7.

17. 109-available

18. De Mendonca A, Vincent JL, Suter PM, Moreno R, Dearden NM, Antonelli M, et al. Acute renal failure in the ICU: risk factors and outcome evaluated by the SOFA score. Intensive Care Med 2000; 26: 915–21.

19. Brivet FG, Kleinknech D, Loirat P, Landais PJM, the French Study Group on Acute Renal Failure. Acute renal failure in intensive care units. Causes, outcome, and prognostic factors of hospital mortality: a prospective multicenter study. Crit Care Med 1996; 24: 192-8.

20. Bagshaw AM, Cruz DN, Noel RT et al. Proposed algorithm for initiation of renal replacement therapy in adult critically ill patients. Crit Care 2009; 13: 317

21. Mehta RL, Pascual MT, Gruta CG, Zhuang S, Chertow CM. Refining predictive models in critically ill patients with acute renal failure. J Am Soc Nephrol 2002; 13: 1350–7.

22. Bellomo R, Kellum JA, Ronco C. Acute kidney injury. The Lancet. 2012; 380 (9843): 756-66.

23. Li P, Burdmann E, Mehta R. Acute kidney injury: global health alert. Kidney Int 2013; 83 (3): 372-6.

24. Schissler MM, Zaidi S, Kumar H, Deo D, Brier ME, McLeish KR. Characteristics and outcomes in community acquired versus hospital-acquired acute kidney injury. Nephrology (Calton) 2013; 18: 183-87.

25. Finlay S, Bray B, Lewington AJ, et al. Identification of risk factors associated with acute kidney injury in patients admitted to acute medical units. Clin Med 2013; 13: 233-38.

26. Idrissi Z. Acute renal failure in a multipurpose emergency medicine department: prevalence, characteristics and prognosis. Thesis. 2016 (Rabat-Morocco).

27. Man N., Touam M, Jungers P. Emergency hemodialysis. Flammarion; Medicine-Science 2010.2 (4): 55

28. Guérin C, Girard R, Selli JM, Perdrix JP, Ayzac L, for the Rhône-Alpes area study group on acute renal failure. Initial versus delayed acute renal failure in the intensive care unit. Am J Respir Crit Care Med 2000; 161: 872–79.

29. Tall A. Contribution to the study of postpartum ARI. These Med, No. 162, 2011. Dakar

30. Maaroufi C, Lazrak MA, El Youbi R et al. Hemodialysis in an emergency. Rev Epidemiol Sante Publique 2009; 57S: S3-S59.

31. Khellaf G, Cholghoum S, Missoum S. et al. Chronic renal failure in nephrology: etiology and prognosis. Nephrol Ther 2011; 7: 301-43.

32. Guérin C, Girard R, Selli JM, et al. Initial versus delayed acute renal failure in the intensive care unit. Am J Resp Crit Care Med. 2000; 161: 872-79.

33. 128. Uchino S, Bellomo R, Morimatsu H, et al. External validation of severity scoring systems for acute renal failure using a multinational database. Crit Care Med 2005; 33: 1961-67.

34. Lazral et al. Hemodialysis in an emergency about 207 cases. Nephrol Ther 2011 (7): 341

35. Talbi S, Thesis: Hemodialysis in emergency situations. Fes. Morocco, 2011: 104

36. Patel R, Pirret A, Mann S, Sherring C Local experience with the use of sustained low efficiency dialysis for acute renal failure. Intensive and Critical Care Nursing 2009; 25; 45-49

37. Jacquet. A, C. Cueff, N. Memain, J.-L. Pallot Progress and Future in Hemodialysis Resuscitation 14 (2005) 539–50

38. Yassine D et al. Emergency management of end-stage chronic renal disease. These Med N ° 009/2012. Fes. Morocco.

Tables

**Table I: Distribution of the different etiologies of CRF in the study population**

| | ***n*** | ***%*** |
|---|---|---|
| Chronic glomerulonephritis of unknown etiology | 15 | 16 |
| HIV nephropathy | 1 | 1,1 |
| Diabetic nephropathy | 9 | 9,6 |
| Mixed nephropathy | 4 | 4,3 |
| Chronic tubulointerstitial nephritis (CTIN) | 4 | 4,3 |
| Bladder tumor | 1 | 1,1 |
| ***Total*** | ***34*** | ***36,4*** |

**Table II: Distribution of patients according to the etiologies of organic ARF (N = 40).**

| | ***n*** | ***%*** |
|---|---|---|
| Acute tubular necrosis of toxic origin | 3 | 3,3 |
| Acute postpartum tubular necrosis | 4 | 4,2 |
| Acute tubular necrosis due to bile salts | 1 | 1,1 |
| Acute tubular necrosis after malaria | 8 | 8,5 |
| HIV nephropathy | 10 | 11 |
| Acute interstitial nephritis | 2 | 2,1 |
| Malignant nephroangiosclerosis | 1 | 1,1 |
| Diabetic nephropathy | 1 | 1,1 |
| Sickle cell nephropathy | 2 | 2,2 |
| Mixed nephropathy | 1 | 1,1 |
| Acute tubulointerstitial nephritis (ATIN) | 2 | 2,1 |
| Acute vascular nephropathy | 2 | 2,1 |
| Obstructive pyelonephritis | 1 | 1,1 |

| | | |
|---|---|---|
| Rhabdomyolysis | 2 | 2,1 |
| ***Total*** | ***40*** | ***57,4*** |

**Table III: relationship between the risk of unfavorable development and the type of renal failure (bivariate analysis).**

| | **No** ***n=26*** | **Yes** ***n=20*** | **Total** ***N=46*** | **p-value** |
|---|---|---|---|---|
| Type of renal failure | | | | 0,003 |
| ARF | 11 (42,3%) | 18 (90,0%) | 29 (63,0%) | |
| CRF | 15 (57,7%) | 2 (10,0%) | 17 (37,0%) | |

**Table IV: relationship between the risk of unfavorable development, age and sex.**

| | No ***n=26*** | **Yes** ***n=20*** | **Total** ***N=46*** | **p-value** |
|---|---|---|---|---|
| Age | | | | 0,170 |
| [18,21) | 2 (7,69%) | 2 (10,0%) | 4 (8,70%) | |
| [21,31) | 4 (15,4%) | 2 (10,0%) | 6 (13,0%) | |
| [31,41) | 2 (7,69%) | 7 (35,0%) | 9 (19,6%) | |
| [41,51) | 3 (11,5%) | 1 (5,00%) | 4 (8,70%) | |
| [51,61) | 3 (11,5%) | 4 (20,0%) | 7 (15,2%) | |
| [61,71) | 8 (30,8%) | 4 (20,0%) | 12 (26,1%) | |
| [71,81] | 4 (15,4%) | 0 (0,00%) | 4 (8,70%) | |
| Sex | | | | 1,000 |
| Male | 17 (65,4%) | 13 (65,0%) | 30 (65,2%) | |
| Female | 9 (34,6%) | 7 (35,0%) | 16 (34,8%) | |