

Full Length Research Paper

# The acute renal insufficiency in medical reanimation at Lomé

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The objective of this study was to investigate the profile of acute renal insufficiency in medical reanimation. It was a retrospective and analytical study which took place from 1 January 2011 to 31 December 2012 at the medical recovery room of the Sylvanus Olympio Teaching Hospital in Lomé. All patients with a minimum of a plasma creatinine  $\geq 150$   $\mu\text{mol/l}$  and / or blood urea  $\geq 10$   $\text{mmol/l}$  were included in this study. During our period of study, 1295 patients were admitted into the medical reanimation of the Sylvanus Olympio Teaching Hospital (CHU) in Lomé and 53 patients had met our inclusion criteria and were the subject of this study. Our patients were most admitted for dyspnea (42.3%), headache (25%). The average creatinine was 138.5mg / l with extremes of 15mg / l and 262mg / l. Fifty patients (94,34%) were suffering from stage I renal pains. The main etiologies of renal insufficiency were HIV (45,2%) malaria (30,2%). ARI are frequent in the medical recovery at the Sylvanus Olympio Teaching Hospital of Lomé. Plasmodium falciparum malaria and HIV are the major causes.

**Key words:** Acute renal insufficiency, epidemiology, reanimation, hospital, Lomé.

## INTRODUCTION

Acute renal insufficiency (ARI) corresponds to a sudden drop in glomerular filtration flow resulting in creatinine increase in relation to basic creatinine and decrease in hourly diuresis in three main stages: risk, injury, failure. His transitory or permanent aspect was correlated with the severity of aggression (Perinel et al., 2014). This classification has been applied and validated in various situations (intensive care, public hospital environment, burns, need for dialysis). An association between the stages of this classification and hospital mortality has also been demonstrated (Uchino et al., 2006).

Acute renal weakness is a relatively frequent and serious complication found in patients admitted in intensive care (Schoenfeld,1991). Its main factors are

hypovolemia, drug toxicity and septicemia (Raq and Friedman,1995) and Acute Respiratory Distress Syndrome (The ARDS Definition Task Force et al., 2012). The prevalence of ARI during infections such as HIV infection was 11.4% in a study conducted in Kinshasa (Nyimiet al., 2001). These factors associate with the ARI increased the rate of hospitalization of patients on reanimation unit and also their mortality.

In Togo, no previous study has been devoted to acute renal failure in medical recovery. Hence the interest of our work whose main objective is to study the profile of the ARI in medical reanimation, their clinic signs and their etiologies.

## MATERIALS AND METHODS

It was a retrospective and analytical study which took place from 1 January 2011 to 31 December 2012 at the

medical recovery room of the Sylvanus Olympio Teaching Hospital in Lomé. All patients with a minimum of a plasma creatinine  $\geq 150$   $\mu\text{mol/l}$  and / or blood urea  $\geq 10$   $\text{mmol/l}$ , and who have an hourly diuresis record including 24-hour diuresis are selected. Variables studied were: age, sex, disease category (medical patient, surgical patient), admission reason, clinical picture (hemodynamic status, respiratory status, urinary signs, hourly diuresis and diuresis after 24 hours), biological examinations (plasma creatinine, serum, natremia/kaliemia, hemoglobin rate), associated deep-rooted weakness, kept diagnosis, evolution (diuresis, blood pressure and temperature) over time of admission. Data analysis was done with SPSS 11.0 software.

## RESULTS

During our period of study, 1295 patients were admitted in the medical reanimation of the Sylvanus Olympio Teaching Hospital (CHU) in Lomé and 53 patients had met our inclusion criteria and were the subject of this study.

### *Socio-demographic aspects*

Men were mostly represented ( $n = 28$ ) with a sex ratio at 1.12. The average age of patients was 42 years with extremes of 16 and 80 years.

### *Clinical signs*

Our patients' admission clinic was dominated by dyspnea (42.3%), headache (25%), anemia (15.4%), vomiting (21%), agitation (9.5%), diarrhea (5.8%) and dehydration (25%). Indeed, 37.7% among our patients had normal blood pressure versus 32.1% who had low blood pressure.

### *Paraclinic aspects*

Average creatinine was 138.5  $\text{mg/l}$  with extremes of 15  $\text{mg/l}$  and 262  $\text{mg/l}$ . Our patients had hypercreatininaemia but 41.51% had serum creatinine above 150  $\text{mg/l}$  (Table 1). Regarding kaliemia, we notice a hyperkaliemia in 8% of cases as shown in Table 2. Renal scan realized has shown that patients have kidneys of normal size and regular contour. Fifty patients (94, 34%) were suffering from stage I renal pains with a conservation of the parenchyma-sinusoid differentiation. The rest of patients presented stage.

### *Etiologies of renal Insufficiency*

The main etiologies of renal Insufficiency were HIV (45,2%) malaria (30,2%) and phytotherapy (15,1%) as shown in Table 3.

## Evolution

Our patients hospitalization duration was 15 days with extremes of 3 and 46 days. The evolution was favorable in 37% of the cases with complete recovery of the renal function and regression of other extrarenal signs. It was

pejorative in 30.2% ( $n = 16$ ) of cases with persistent kidney weakness and death in a table of polyvisceral weakness. The increase in deaths was correlated with the increase in blood creatinine (Table IV)

## DISCUSSION

This study includes the itinerant link of a full retrospective study. But this study allowed us to evaluate the epidemiological, clinical and evolutionary aspects of ARI in the medical recovery unit of the SO Teaching Hospital. We were limited by the lack of information in some files.

### Epidemiological aspects of the ARI

Our result is in agreement with that of the Western series which reported a frequency ranging from 3 to 30% (Laino and Pascual, 1996). In our series we found a frequency of 4.09%. This shows that the frequency of the ARI/IRA remains non-negligible. In our series, we found a male predominance with a sex ratio of 1.12. This male predominance was also observed in all publications (Brivet, 1996; Bourquia, 1989; Groeneveld, 1991; Kleinknecht, 1994) with a sex ratio ranging from 1.3 to 2.9. This masculine predominance remains unexplained.

### *Clinical aspects*

Our patients' admission clinic was dominated by dyspnea (42.3%), headache (25%), anemia (15.4%), vomiting (21%), agitation (9.5%), Diarrhea (5.8%) and dehydration (25%). This clinical profile remains classic, but it is reported at various frequencies by different authors (Brivet, 1996; Castaigne, 1992; Vincent, 2004; Spitz, 1946; Mulumba, 1990).

### Biological aspects

Plasmic creatinemia was superior than 150  $\text{mg/l}$  in 41.51% of our patients. Average creatinine was 138.5  $\text{mg/l}$  with extremes ranging from 15  $\text{mg/l}$  to 262  $\text{mg/l}$ . Our result is in agreement with that of Laino et al. (1996). This would explain why any hyper creatinemia induces an ARI/IRA.

### Etiological aspects

Causes of acute renal insufficiency in reanimation are more often multiple and associated (Laino, 1996; Brivet, 1996; Bourquia, 1989; Groeneveld, 1991; Kleinknecht, 1994). Sepsis, cardiogenic, hemorrhagic and hypovolemic shocks are the main causes of ARI in the literature (Laino, 1996; Kleinknecht, 1994; Rasmussen, 1982). In our study, we have various causes but there is a high proportion of hypovolemic patients which is explained by the frequency of pathology exposed to hypovolemia such as: gastroenteritis and anemia.

In our study, malaria with *Plasmodium falciparum* has been recognized as one of the etiologic factors of ARI. Its

**Table 1.** Distribution of patients according to the creatininemia.

Creatininemia (mg/l)	Effectifs	Percentage (%)
[15-50[	8	15,1
[50-100[	13	24,5
[100-150[	10	18,9
>150	22	41,5
Total	53	100,0

**Table 2.** distribution of patients according to kaliemia.

	Numbers	Percentage (%)
<3,5	8	16,0
3,5 à 5,4	38	76,0
>5,4	4	8,0
Total	50	100,0

**Table 3.** Distribution of patients according to etiologies.

	Numbers	Percentage (%)
Malariae	16	30,2
Phytotherapy	8	15,1
HIV	24	45,2
Cutaneous Septical shock (Erysipel)	2	3,8
Post hemorrhagict	3	4,7
Abortum+ post partum		

**Table 4.** Distribution of patients who died of ARI according to the value of creatinine etiologies.

Creatininemia (mg/l)	Effectifs	Percentage (%)
[15-50[	0	00,0
[50-100[	1	06,25
[100-150[	05	31,25
>150	10	62,5
Total	16	100,0

rate is 30.19%. Indeed, the association of an ARI with a malarial access to plasmodium falciparum is a classic fact well known before the pandemic of the infection of the HIV (De Mendona et al., 2000). In tropical regions, the prevalence of ARI in falciparum malaria reaches 4% (Rasmussen and Ibels, 1982). The place of malaria among the causes of ARI in these tropical regions is also not negligible. An recent work done at the nephrology unit of the university clinics of Kinshasa (Nyimi et al., 2001) showed that malaria was incriminated in 36.8% of ARI

cases. Our results demonstrated the importance of AIDS in the ARI; It's 24.52% and 20.75% respectively associated with diarrhea and anemia.

They confirm on of ARI frequent occurrence in patients severely affected by infections and / or neoplasias opportunists of HIV infection (Edoh-Bédy, 2005). In other countries where this affection was also reported in AIDS, as in the USA, studies carried out were longitudinal and ARI had was an incidence which was varying between 3 and 55% (Raqand Friedman, 1995). This kind of study is

desirable where the ARI associated with AIDS could have a very high incidence due to certain factors favoring our environment. Among these, we can mention the preponderance of diarrhea in AIDS in our countries (Cole,2000), the hyperendemicity of Plasmodium Falciparum malaria in our environments, the high frequency of Salmonella in HIV infection(Farota,2008) and uncontrolled use of both traditional and modern medicines.

Acute renal deficiency is the most frequent entity in medical recovery units with a frequency ranging from 56 to 81% of cases according to the studies (Brivet, 1996; Bourquia, 1989;De Mendona,2000). It allowed us to report 58.49% of ARI induced by phytotherapy and drugs.

Acute tubular necrosis is by far the most frequent cause of organic renal deficiency ranging from 73% to 84% (Brivet, 1996; De Mendona, 2000).In our study, we cannot precisely tell the rate of acute tubular necrosis; But this rate seems to be high given the frequency of certain etio-pathogenic factors, namely phytotherapy, infectious syndrome. Drug nephrotoxicity (15.10%) was found in our series. This same observation has been found in other publications (Bourquia,1989;De Mendona,2000). This could be explained by the low socioeconomic level that often forces patients to use street medicines.

### Evolutionary aspects

During the study, we have unregistered 30, 19% of death. This major mortality is mainly explained by two factors: firstly, by the greater frequency of tubular necrosis in reanimation which is considered to be a factor that multiplies mortality by 2 to 7 times Farota,2008)and then to the severity of the initial clinical results of recovering patients.

### CONCLUSION

The present study shows that ARI is frequent in the medical recovery at the Sylvanus Olympio Teaching Hospital (CHU) in Lomé. It is associated with multivisceral weakness, resulting in its severe prognosis. It mainly affects young patients with male predominance. Plasmodium falciparum malaria, HIV, diarrhea, and anemia are the major causes. Hence, the need for people awareness in order to prevent the severe affection occurrence.

### REFERENCES

Brivet FG, Kleinknecht DJ, Loirrat P, Landais PJ (1996). Acute renal Failure in the medical intensive care units-causes, out come and prognostic Factors of Hospital mortality: a prosptive, multicenter study. Crit. Care Med. 24 (2): 98-192.

Bourquia A, Ramdani B, Jabrane AJ, Alaoui M, Zaid D (1989). L'insuffisance rénale aiguë au Maroc. Presse Med. 18 (28) : 1375-8.

Castaigne A (1992). Sémiologie néphrologique : sémiologie médicale initiation à la physiopathologie. 3<sup>ème</sup>Edn. Paris, France: Sandoz, pp. 136-138.

Cole L, Bellomo R, Silvester W, Reeves JH (2000). A Prospective, Multicenter study of the Epidemiology management and outcome of severe acute renal failure in a "closed" ICU system. Am.I. Resp. Crit. Care Med. 162: 191-6.

De Mendona A, Vincent JL, Suter PM, Moreno R, Dearden NM, Antonelli M, Takala J, Sprung C, cantraine F (2000) . Acute Renal Failure in the Intensive Care Unit: Risk Factors and outcome evaluated by the SOFA score. Intensive care Med. 26: 915-21.

Edoh-BedyL (2005). Hypertension artérielle et insuffisance rénale chronique: aspects épidémiologiques, cliniques, échographiques et thérapeutiques. Thèse de médecine, Université de Lomé, Togo.

Farota A (2008). Insuffisance rénale aiguë : Facteurs étiologiques et pronostiques. Thèse de médecine, Université de Bamako ; Mali

Groeneverd AB, Trand D, Vander Meulen J, Nauta JJ, Thijs LG (1991). Acute renal Failure in the medical intensive care unit: predisposing, complicating Factors and outcome. Néphron. 59 : 602-10

Kleinknecht D, Pallot JL (1994). Epidémiologie et pronostic de l'insuffisance rénale aiguë. Néphrologie.15 :281-88.

Liano F, Pascual J (1996). Epidemiologyof acute renal failure: a prospective, multicenter community-based study;and the Madrid Acute Renal Failure Study Group. Kidney Inter. 50 (3):811-8.

Mulumba MP, Werry M, Ngmbi NP, Paluku K, Vander Struyft P, De Muyunck A (1990). Le paludisme de l'enfant à Kinshasa (Zaïre). Influence des saisons, de l'âge, de l'environnement et du standing familial. Med Trop. 50(1) : 53-64.

Nyimi ML, Lepira S, Ebenco BC, Nseka M.N, Longo-Mbenza B (2001).Insuffisance rénale aigue associée à l'infection par le Vih à Kinshasa à propos de 24 observations. Louvain Med. 120: 167-172.

Perinel Ragey S, Vincent F, Lautrette A, Dellamonica J, Pons,CMariat B, Cohen J, Zeni F, Souweine B, Darmon M (2014). Insuffisance rénale transitoire et persistante: sont-elles équivalentes? Résultat d'une étude multicentrique. Réanimation 24:S26-S29 Doi 10.1007/s13546-014-0947-4

Raq TKS, Friedman EA (1995). Outcome of acute renal failure in patients with acquired immune-deficiency syndrome. Am J Kidney Dis. 25(3):390-8.

Rasmussen HH, Ibels LS (1982).Acute renal failure multivariate analyses of causes factors. Am. J. Med. 73: 211-8.

Schoenfeld PY (1991). HIV infection and renal diseases. *Aids clinical Care*. 3: 9-11.

Spitz S (1946). The pathology of acute falciparum malariae. *Milit Surg*. 99:555-72.

Vincent JL, Bota DP, De Backer D (2004). Epidemiology and outcome in renal Failure. *Int J Artif Organs*. 27: 8-2013

The ARDS Definition Task Force, Ranieri VM, Rubenfeld GD, Thompson BT, Ferguson ND, Caldwell E, et al (2012). Acute respiratory distress syndrome: the Berlin Definition. *JAMA*. 307:2526-33

Uchino S, Bellomo R, Goldmith D, Bates S, Ronco C (2006). An assessment of the RIFLE criteria for acute renal failure in hospitalized patients. *Crit Care Med*. 34: 1913-7.