

Cardio-Renal Syndrome in Hospitalization in the Cardiological Departement of Gabriel Toure Chu about 31 Cases

⁴Sonfo B, ¹Sangare I, ¹Ba H O, ²Trore D, ¹Toure M, ¹Sidibe N, ¹Traore E, ¹Sogodogo A, ¹Camara H, ¹Fofana CH, ¹Dakouo R, ³Almou AD, ¹Doumbia MK, ¹Sagara I, ²Coulibaly S and ^{*1}Menta I

^{*1}Department of Cardiology, Gabriel Toure University Hospital, Bamako, BPE 421, Mali

²Departement of Internal Medecine, Point G University Hospital, BP 333, Bamako, Mali

³Departement of Cardiology, Reference Health Center, Districk III, Bamako, Mali

⁴Departement of Cardiology, University Hospital of Kati, BP 16, Kati, Mali

ABSTRACT

Introduction: The cardio-renal syndrome (CRS) is a complex pathophysiological entity affecting the heart and kidneys in which acute or chronic dysfunction of one organ may induce acute or chronic dysfunction of the other organ [1]. In Africa, in general, the prevalence of CRS is poorly known, in Senegal the hospital prevalence of CRS is 3.7% in cardiology [2]; In Mali this prevalence is poorly known. The objective of this work was to study the CRS in the cardiology department CHU Gabriel Toure. **Methods:** The Study is a retrospective cross-sectional about 31 patients with cardio-renal syndrome hospitalized from January 01, 2015 to December 31, 2018. The data was analyzed on the SPSS 20 for Windows software. **Results:** We included 31 patients. The prevalence was 4% with a male predominance (sex ratio at 1:21) and a mean age at 59.51 years [60-74]. Risk factors were dominated by high blood pressure (71.1%) and diabetes (16,1%). The symptomatology was dominated by dyspnea (800.06%) and tachycardia (77.4%). The average clearance (MDRD) at 24.61 ml/min doppler ultrasound was predominantly LV systolic (90.32) dysfunction. A death (3.22%) was noted. **Conclusion:** The cardio-renal syndrome remains a frequent complication in the evolution of all cardiopathies, the elderly being the most affected with a male predominance. The major FDR observed in this work was arterial hypertension with a frequency of 71%. The diagnosis is essentially based on cardiac ultrasound and measurement of serum creatinine. Management is difficult in our context and requires a close multidisciplinary collaboration: general practitioner-cardiologist and nephrologist. Prevention relies on the control of cardiovascular risk factor (CRF).

Keywords: Cardio-renal syndrome, cardiology department, GABRIEL TOURE University Hospital, Mali

INTRODUCTION

The cardio renal syndrome is a complex pathophysiological entity affecting the heart and kidneys in which acute or chronic dysfunction of one organ may induce acute or chronic dysfunction of the other organs consensus of experts proposed in 2008, a classification of these syndromes that takes in to account the organ initially defective on the one hand, and the kinetics of failure on the other hand (Table 1) [3]. According to the US ADHERE REGISTRY at least 65% of patient with acute

***Corresponding Author:**

chakamenta[at]gmaildotcom

Receiving Date: November 08, 2019

Acceptance Date: November 18, 2019

Publication Date: November 21, 2019

heart failure have clearance [4]. The charm study showed that 40% of patients in stage ii and iii of the New York Heart association (NYHA) had a renal insufficiency [5]. According to a senegalese study, the hospital prevalence of SCR is 3.7% in a cardiological environment [6]. In Mali, however, no previous study has been devoted to CRS in cardiology. It is to overcome this insufficiency that the study was undertaken this work.

Table 1: Classification of cardio-renal syndrome

Cardio-renal syndromes	Designation	Description
Type I	Acute cardio-renal syndrome	Acute cardiac dysfunction leading to acute renal failure
Type II	Chronic cardio-renal syndrome	Chronic cardiac dysfunction responsible for chronic renal failure
Type III	Acne-cardiac acute syndrome	Heart failure of acute renal failure
Type IV	Chronic renal-cardiac syndrome	Heart Failure of Chronic Kidney Disease
Type V	Secondary cardio-renal syndrome	"Systemic" diseases leading to simultaneous impairment of cardiac function and kidney

METHODS

This was a retrospective cross-sectional study that included all patients hospitalized in the CHU-GT cardiology department for IC confirmed by cardiac ultrasound with MDRD-IR for a period of 3 years (January 01, 2015 to December 31, 2018). The data collection was made from a survey sheet previously developed and tested. Each survey card was completed from the patient's chart.

The following parameters were searched: Names, First names, Age, Ethnicity, Cardiovascular risk factors, clinical and paraclinical signs. Signs of heart failure (CI) were dyspnea (NYHA), cough, tachycardia, crepitations, gallop sounds for left heart failure and hepatomegaly, jugular turgor, IMO, and ascites for the right IC. Renal failure was selected for an increase in creatinine levels of at least 3 mg / L, ie 26 micromol / L [6]. Data was analyzed with SPSS 20.0 for Windows software.

RESULTS

We included 31 patients. The hospital prevalence of SCR was 4% with male predominance (sex ratio at 1.21). The average age was 59.51 years old with extremes of 22 and 92 years old. The most representative age group was between 60-74 years old (48.4%). Risk factors were dominated by high blood pressure (71.1%) followed by diabetes (16.1%). The signs were classified as functional signs (Table 2), signs on inspection and palpation (Figure 1), and auscultatory signs (Figure 2). In biology, there was anemia in 6 patients (19.35%), the ionogram was disrupted in 4 patients. The Creatinine clearance averaged 24.61 ml/min (Figure 2). The cardio-renal syndrome was predominantly type 1

(87.1%). Electrical abnormalities were dominated by left ventricular hypertrophy (64.5%), repolarization disorders (58.06%), and ventricular extrasystoles (29%). Doppler echocardiography found mainly systolic dysfunction of the left ventricle (90.32%), dilation of the left ventricle, left atrium, and right ventricle with respective frequencies 51.61%, 25.80% and 9.67%. During our series, rest and a low sodium diet were observed in all our patients.

Diuretics were used as first-line agents in 93.6% of our patients in agreement with the literature [7,8]. Use of ACE inhibitors was performed in 80.54% of our patients with careful introduction adapted to renal function only 3.2% of our patients received spironolactone and this molecule was administered when these patients had the means to control serum creatinine and serum potassium during their follow-up. Beta-blocker was used in a patient who had good tolerance to this molecule. As a result, only 3.2% of patients in our study received beta blocking therapy (bisoprolol). In our study the use of nitrates was difficult for reasons of unavailability of the product. That's why only 9.67% of patients have benefited from isosorbide.

Table 2: Distribution of patients according to functional signs

Functional signs	Effective	Frequency (%)
Dyspnea	25	80,6
Cough	19	61,3
Chest pain	4	12,5
Neurological deficit	1	3,2
Palpitations	1	3,2

During our study the evolution of the disease was favorable in 93.54% of our patients during hospitalization. The study recorded complications of A. ischemic A.V.C. in one patient, 3.22%, and one patient death, 3.22%.

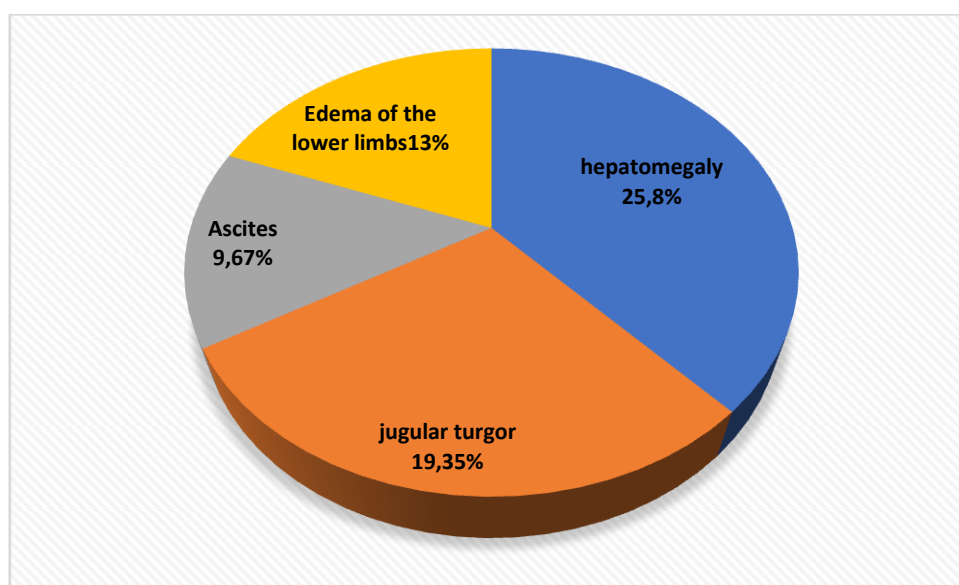


Figure 1: Distribution of patients by signs at inspection and palpation

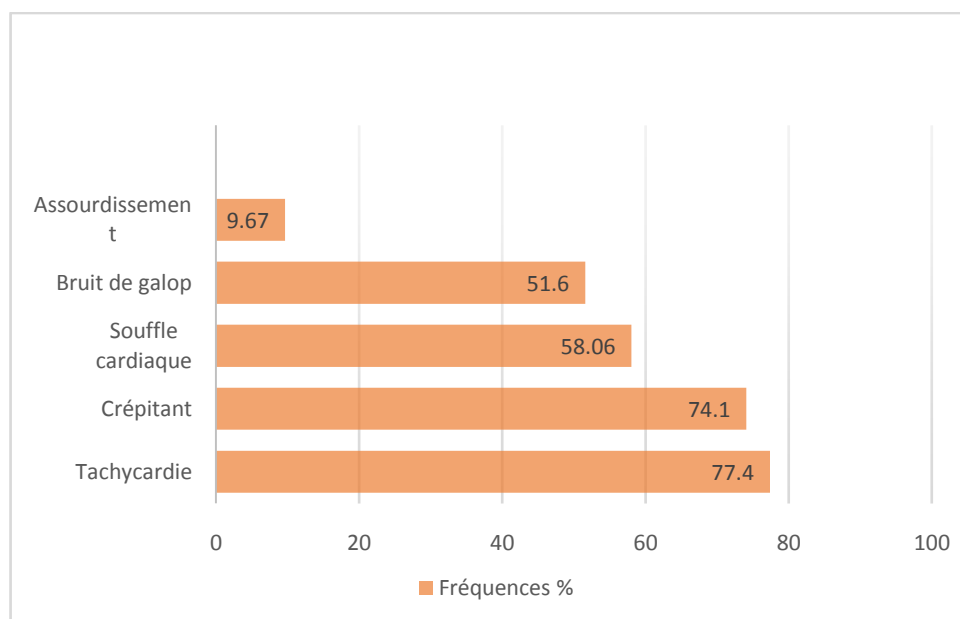


Figure 2: Distribution according to the auscultatory signs

DISCUSSION

In our study, the prevalence of SCR was 4% of hospitalized patients during the study period with a predominance of type I (87.1%). This rate is lower than that reported by the literature 65% according to the American registry (ADHERE); 40% according to the CHARM study [4,5]. In Senegal Malick B found in 2017 a prevalence of 3.7% with a predominance of type II [2]. The low prevalence that we observed can be explained by the size of our sample, the duration of our study and the financial handicap of our patients. The predominance of Type I in our series can be explained by the late diagnosis of hypertension, the irregular care of hypertensive patients and the absence of a Cardiovascular Intensive Care Unit (ICUU) in our structure. The age group 60 - 74 was the most represented with a frequency of 48.4%. The average age was 59.51 years, the extremes ranging from 22 to 92 years. Malick B found a predominance of the age group 50 - 70 years (54.6%) [2].

In the West it is an affection of the elderly with a diagnosis around 70 years [9,10]. In our series there were 17 men and 14 women with a sex ratio of 1.21. This male predominance has been reported generally by the authors [2,11]. In our study, the predominant ethnic group was Bambara with a frequency of 35.5% which could be explained by the fact that it is the majority ethnic group in Mali. The risk factors observed were high blood pressure, tobacco and diabetes with respective frequencies 71.1%, 25.8%, 16.1%; in agreement with Malick B who found a prevalence of hypertension with a frequency of 57.8% [2].

CONCLUSION

The cardio-renal syndrome remains a frequent complication in the evolution of all cardiopathies, the elderly being the most affected with a male predominance. The major FDR observed in this work was arterial hypertension with a frequency of 71%. The diagnosis is essentially based on cardiac ultrasound and measurement of serum creatinine. Management is difficult in our context and

requires a close multidisciplinary collaboration: general practitioner-cardiologist and nephrologist. Prevention relies on the control of cardiovascular FDR.

Contribution of our study to the knowledge: The prevalence found in cardiology at CHU Gabriel Touré is low. It is most often cardio-renal syndrome type 1. Targets: Elderly male with predilection

CONFLICTS OF INTEREST

The authors do not declare any conflict of interest.

REFERENCES

1. Valderrabano F, Jones EHP, Mallick NP. Report on Management of Renal Failure in Europe, XXIV, 1993. Nephrology Dialysis Transplantation [Internet]. Oxford University Press (OUP); 1995 Jan 1;10(supp5):1–25. Available from: <http://dx.doi.org/10.1093/ndt/10.supp5.1>
2. Bodian M, Thiaw A, Sarr SA, Babaka K, Aw F, Ngaïde AA, et al. Cardio-renal syndrome: epidemiological aspects, about 36 cases in a cardiology ward in Dakar. Pan African Medical Journal [Internet]. Pan African Medical Journal; 2017; 28. Available from: <http://dx.doi.org/10.11604/pamj.2017.28.58.10257>
3. Ronco C, Kellum JA, Bellomo R, Mehta RL. Acute Dialysis Quality Initiative (ADQI). Contributions to Nephrology [Internet]. S. KARGER AG; 2013;1–4. Available from: <http://dx.doi.org/10.1159/000349961>
4. Garrick R. High prevalence of renal dysfunction and its impact on outcome in 118,465 patients hospitalized with acute decompensated heart failure: a report from the ADHERE database. Yearbook of Medicine [Internet]. Elsevier BV; 2008 Jan;2008:223–5. Available from: [http://dx.doi.org/10.1016/s0084-3873\(08\)79141-7](http://dx.doi.org/10.1016/s0084-3873(08)79141-7)
5. Ho M. Cardiorenal syndrome in acute decompensated systolic heart failure. The University of Hong Kong Libraries; Available from: http://dx.doi.org/10.5353/th_b5805045
6. Gottlieb SS, Abraham W, Butler J, Forman DE, Loh E, Massie BM, et al. The prognostic importance of different definitions of worsening renal function in congestive heart failure. Journal of Cardiac Failure [Internet]. Elsevier BV; 2002 Jun;8(3):136–41. Available from: <http://dx.doi.org/10.1054/jcaf.2002.125289>
7. Dorrance A. Faculty of 1000 evaluation for ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. F1000 - Post-publication peer review of the biomedical literature [Internet]. F1000 (Faculty of 1000 Ltd); 2014 Jul 14; Available from: <http://dx.doi.org/10.3410/f.718489795.793497182>
8. ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death--executive summary: A report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop Guidelines for Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death) Developed in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. European Heart Journal [Internet]. Oxford University Press (OUP); 2006 Mar 22;27(17):2099–140. Available from: <http://dx.doi.org/10.1093/eurheartj/ehl199>
9. Moneta GL. Chronic Kidney Disease and the Risks of Death, Cardiovascular Events, and Hospitalization. Yearbook of Vascular Surgery [Internet]. Elsevier BV; 2006 Jan;2006:111–2. Available from: [http://dx.doi.org/10.1016/s0749-4041\(08\)70096-4](http://dx.doi.org/10.1016/s0749-4041(08)70096-4)
10. Poussel F, Isnard R, Komajda M. Insuffisance cardiaque : aspects épidémiologiques, cliniques et pronostiques. EMC - Cardiologie [Internet]. Elsevier BV; 2006 Jan;1(1):1–17. Available from: [http://dx.doi.org/10.1016/s1166-4568\(03\)00108-6](http://dx.doi.org/10.1016/s1166-4568(03)00108-6)
11. Bouhour J-B. Insuffisance cardiaque. Épidémiologie – Perspectives d’avenir. Bulletin de l’Académie Nationale de Médecine [Internet]. Elsevier BV; 2002 Jan;186(1):19–30. Available from: [http://dx.doi.org/10.1016/s0001-4079\(19\)34370-5](http://dx.doi.org/10.1016/s0001-4079(19)34370-5)