Evaluation of Renal Function by Modification of Diet in Renal Disease in Surviving Patients of Acute Coronary Syndrome at the Cardiology Department of Ignace Deen National Hospital

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Abstract

The MDRD (Modifying Diet in Renal Disease) formula allows to estimate from a creatinine level, the glomerular filtration rate (GFR) whose evaluation makes it possible to assess the renal function, even if the physiology of the kidney is not limited to this process. Impairment of renal function is associated with other risk factors for mortality in patients with acute coronary syndrome (ACS). The objective of this study was to evaluate renal function by the MDRD formulation in SCA survivors.

This was a prospective study of the descriptive and analytic type, with a duration of 06 months from April 1 to September 30, 2016, which concerned all SCA survivors who performed serum creatinine.

Of 23 patients included, 52.17% had chronic renal failure. The average age was 60.61 years old, the majority of whom were male. The most common reasons for consultation were chest pain (82.61%), dyspnea (30.43%), followed by facial swelling, hiccups and oliguria with a common frequency of 26.10%. The main risk factors identified were age (100%), male sex (86.96%), high blood pressure (73.9%), physical inactivity (39.13%), tobacco (30.43%), diabetes (30.43%) and overweight (21.74%). In addition, there is no statistically significant relationship between GFR and the ejection fraction (p = 0.538).

DFG estimation by MDRD is one of the methods of choice for detecting early chronic kidney disease, with a view to specifically considering an adequate management strategy.

Keywords: Kidney Function; MDRD; Survivors; SCA

Introduction

The MDRD (Modification of Diet in Renal Disease) formula makes it possible to estimate, from a creatinine level, the glomerular filtration rate (GFR), the evaluation of which makes it possible to assess renal function, even if the physiology of the kidney is not limited to this process [1,2]. Impaired renal function is associated with other risk factors for high mortality in patients with acute coronary syndrome (ACS) [3]. A permanent decrease in GFR is called chronic renal failure (CRF). In the United States of America, from 1999 to 2004, the prevalence of untreated CRF reached 13% of the population aged over 20 years [4]. In France in 2005, the prevalence of renal failure in patients with ACS is estimated to be between 20 and 40% [3]. In Morocco in 2009, chronic kidney disease (CRD) was present in 2.9% of the adult population [5]. In the Democratic Republic of the Congo, the overall prevalence of CKD was estimated in 2010 at 12.4% [6]. In Guinea, studies carried out at the Nephrology Department of the Donka National Hospital on the prevalence of CRF in 2004, 2007 and 2009, reported 33.56% respectively; 38.43% and 42.18% [7-9].

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Objective of the Study

The objective of this study was to assess renal function by the MDRD formula in patients with ACS survivors.
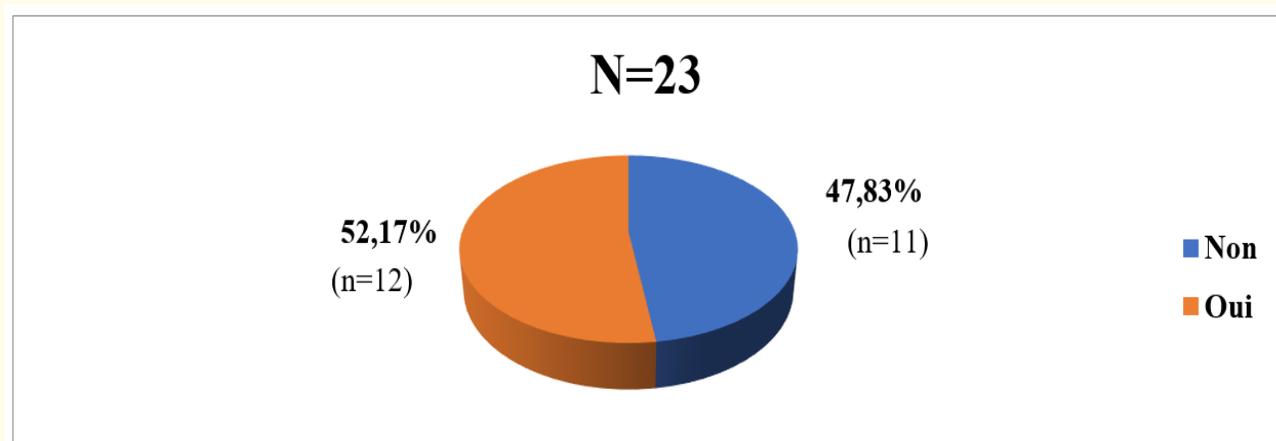
Methodology

The study was performed in the Cardiology Department of the Ignace Deen National Hospital. It was prospective of a descriptive and analytical type, lasting 06 months from April 1 to September 30, 2016, and concerned all patients admitted to the Cardiology department for ACS during the study period.

Were included, all patients surviving ACS, having performed the plasma creatinine assay, and whose GFR was evaluated by the MDRD formula. Not included in our study were all patients who died and/or whose serum creatinine assay was not performed. After exhaustive recruitment, the data was collected using an individual survey sheet pre-established for this purpose.

Result

Cardiovascular pathologies	Actual	Percentage (%)
High blood pressure	57	38,00
Myocardiopathies	25	16,67
Acute coronary syndromes	23	15,33
Valvulopathies	21	14,00
Chronic pulmonary heart	11	07,33
Pericarditis	08	05,33
Deep vein thrombosis	03	02,0
Cardiothyreosis	01	0,67
Ventricular communication	01	0,67
Total	150	100

*Table 1:* *Distribution of patients according to cardiovascular morbidity.*

Figure 1: *Frequency of CRF in ACS patients.*

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Age range	Actual	Percentage (%)
45 - 54	6	26,09
55 - 64	9	39,13
65 - 74	7	30,43
≥ 75	1	4,35
Total	23	100

Table 2: Distribution of patients by age.
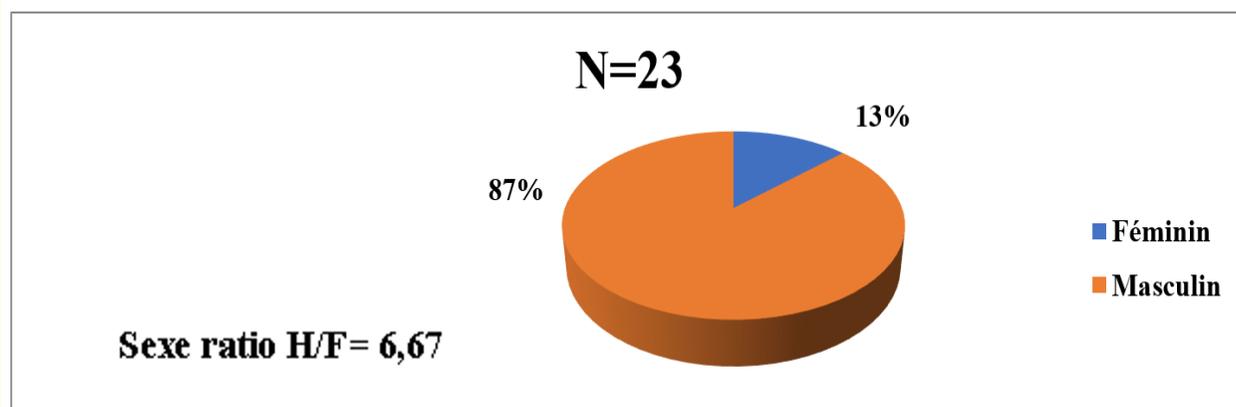
Figure 2: Distribution of patients by sex.
Average age = 60.61 years; Extreme = 45 and 90 years old.

FDRCV	Actual	Percentage (%)
Age	23	100
Male	20	86,96
HTA	17	73,91
Sedentary lifestyle	9	39,13
Diabetes	7	30,43
Tobacco	7	30,43
Overweight	5	21,74
High CRP	4	17,4
Family predisposition	3	13
Dyslipidemia	2	8,7
Stress	1	4,35

Table 3: Distribution of patients according to cardiovascular risk factors.

DFG (ml/mn) FE (%)	< 60	≥ 60	Total
≤ 35	1	1	2
≥ 60	2	1	3
36 - 59	1	3	4
Total	4	5	9

Table 4: Distribution of patients according to renal function and left ventricular ejection fraction. $Chi^2 = 1,2375$ and P value = 0,5386.

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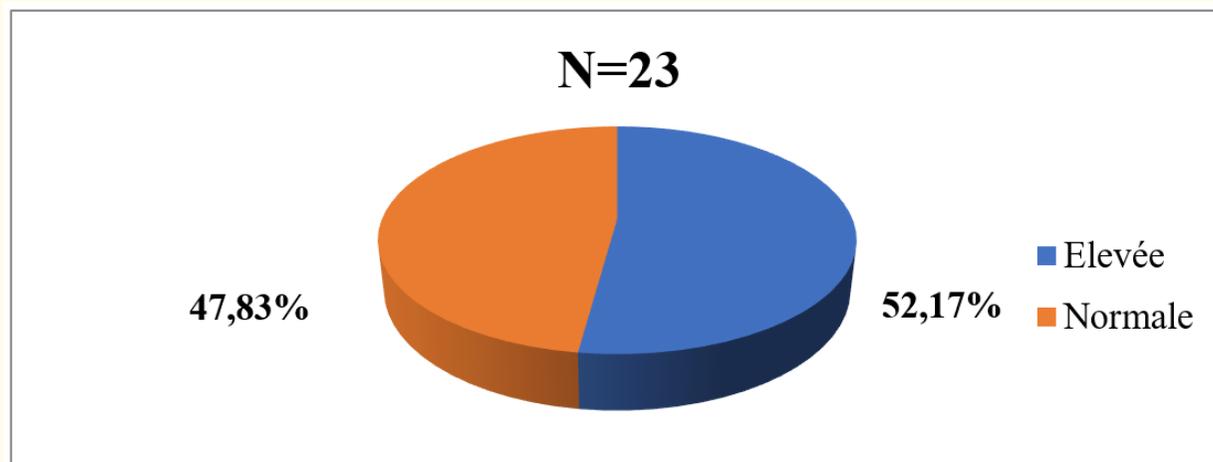
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Figure 3: Distribution of patients according to serum creatinine.

Discussion

In our series, we collected 150 cases of hospitalizations for cardiovascular pathologies, of which 23 were hospitalized for ACS, i.e. a frequency of 15.33%. This high rate of ACS observed in our study could be explained by the change in the lifestyle of populations, namely sedentary lifestyle, tobacco and excessive consumption of alcohol and too fatty foods.

52.17% of patients presented with CRF. This result is comparable to that reported by Dumaine R., *et al.* [3] in Paris in 2005 who found a prevalence of between 20 and 40% renal failure, but lower than that reported by Khachab H., *et al.* [10] in France in 2013 who found a prevalence of more than 45% of patients with CKD. This finding could be explained by the fact that kidney failure is very commonly seen in a patient with cardiovascular disease.

The most affected age group was between 55 and 64, or 39.1%. The average age was 60.61 years with extremes of 45 and 90 years. In France in 2003, Dujardin JJ., *et al.* [11] reported a mean age of 67.7 years. Indeed, it has been established that cardiovascular morbidity and mortality increases with age.

20 cases or 87% were male against 3 cases or 13% female, with a sex ratio M/F of 6.67. Kevin N [12] in Guinea in 2008 in his Doctorate in Medicine thesis reported 70.75% male against 29.25% female. This low rate of female representation could be explained by the protective role of estrogen enjoyed by women.

Age was the most common CRDF at 100%, followed by males and hypertension with frequencies of 86.96 and 73.9%, respectively. These results are comparable to those of Khachab H., *et al.* [10] in France in 2013, which reported 70% hypertension but different from those of Sarr M., *et al.* [13] who found a frequency of 56.40% hypertension. This is because the incidence of coronary heart disease and kidney disease is greater the higher the blood pressure is.

47.8% of patients had normal serum creatinine versus 52.2% who had elevated serum creatinine. This rise is a poor reflection of renal function, as it indicates a halving of the GFR, that is to say a significant degradation of renal function.

From the association between renal function and left ventricular ejection fraction, our study showed that there was no statistically significant association between ejection fraction and GFR (p = 0.538).

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Conclusion

This study showed that kidney function impairment in ACS survivors was noticeable. It emphasizes the need to systematize the calculation of GFR in these patients in order to reduce the risk of morbidity and mortality linked to the combination of ACS and renal damage. Estimation of GFR by MDRD is one of the methods of choice for detecting early chronic kidney disease, in order to specifically consider an adequate management strategy.

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