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Heart and Vascular Disease

Acute Coronary Syndromes in Type II Diabetics at CHU Marrakech Cardiology Service

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Abstract **Original Research Article**

Background*:** Acute coronary syndrome is a medical emergency with a pejorative prognosis linked to many early mechanical complications. Type 2 diabetes is currently a huge public health problem and remains the main risk factor for ischemic heart disease. ***Purpose*:** The objective of the study was to determine the epidemiological, electrical and angiographic characteristics of acute coronary syndromes in the type 2 diabetic patient admitted to our service. ***Method: It is a descriptive and analytical data collection study conducted between August 2019 and February 2020 on 169 patients divided into 71 diabetic and 98 non-diabetic patients. Results: The average age of the diabetic patient was 58 years ± 8.7 years with male predominance ($p<0.04$). The age of diabetes was 8.7± 5.7 years with an average glycated hemoglobin of 8.7%. The main risk factors for diabetes were HTA in 58.6% and dyslipidemia in 88%. Left ventricular dysfunction was present in 52% of patients with electrically significant anterior involvement ($p=0.05$). Angiographic lesions were diffuse and predominantly tritroncular in 59% ($p<0.01$) of cases increasing the risk of morbi-mortality. ***Conclusion:*** ACS in diabetic type 2 affect a younger population, the involvement is more often stenosis or occlusion and the lesions are multitruncated in the majority anterior.

Keywords: Diabetes Type 2 – Acute coronary Syndrome – Atherosclerosis – Morocco.

INTRODUCTION

Coronary artery disease is the leading cause of morbi-mortality in diabetes. The prevalence of type 2 diabetes is increasing strongly in Western countries but also on all continents. The World Health Organization predicts 592 million cases of diabetes by 2035 and 693 million by 2045, or more than 15% of the world's population beyond 60 years. In more than 95% of cases, it would be type 2 diabetes [1]. In France, 30 to 40% of patients hospitalized for coronary syndrome have type 2 diabetes or a known or unknown glucose intolerance. Diabetic patients are said to have more comorbidities that expose them to more extensive coronary lesions that play a key role in its adverse course. The combination of coronary artery disease and type 2 diabetes exposes patients to a vicious cycle of adverse prognosis whose main consequences are the progression to severe left ventricular dysfunction responsible for mortality by the occurrence of complications hemodynamic or rhythmic. The objective of our work was to determine the epidemiological, electrical and angiographic features of coronary disease in diabetics and non-diabetics admitted for ACS.

PATIENTS AND METHOD

This is a cross-sectional, comparative, and analytical study. The study took place from August 2019 to February 2020 in the cardiology department of the Mohamed VI Marrakech Hospital and University Center. The study population was based on the following operational definitions:

Patient admitted for ACS with permanent shift of the ST segment in a context of infarct pain evolving for less than 24 hours.

Patient admitted for ACS without ST segment shift evolving for less than 24 hours in a context of infarct pain with US troponin biology positive; five times higher normal and positive kinetics.

Diabetic patient known, followed, treated or not with HBA1C at admission. We did not include: known type 1 diabetic patients, patients followed for chronic coronary disease, patients with chest pain for > 3 months, patients admitted for heart failure in an ischemic setting. Patients admitted to post myocardial infarction were excluded. A total of 169 patients were

collected into two groups:

Group I: Diabetic patients (n=71)

Group II: Non-diabetic patients (n=98)

The data was entered on the Excel version 2010, the population and proportions were estimated for the qualitative and categorical variables. The mean and standard deviation were determined for comparison of quantitative variables. The Pearson Khi 2 test and the Kruskal-Wallis non-parametric test were used to compare qualitative variables. The Anova test compared quantitative variables. Significance threshold was set at $p<0.05$.

RESULTS

Socio- epidemiological characteristics

The median age in GI group was 58 years ± 8,7years (extremes of 43 and 78 years). Patients were predominantly male (80%) with secondary education level, social type health coverage (national social security fund), civil servant and worker. Patients came from peri-urban areas. The median age in GII group was 62, 6± 6,7years (extremes of 46 and 84 years).

The age of diabetes was 8.7 ± 5.7 years (1 month - 19 years) of which approximately 62% of patients were on insulin therapy and 36% under oral anti diabetic. Blood sugar imbalance was judged on the basis of glycated hemoglobin; the average was 8.7% (extremes of 6,1 to 12).

The cardiovascular risk factors

The main cardiovascular risk factors were distributed as follows in group I, HTA (58,6%), smoking (47%) and dyslipidemia (88%) predominance LDL-C fraction. In group II, the main cardiovascular risk factors were smoking (72%), HTA (41%) and dyslipidemia (60%).

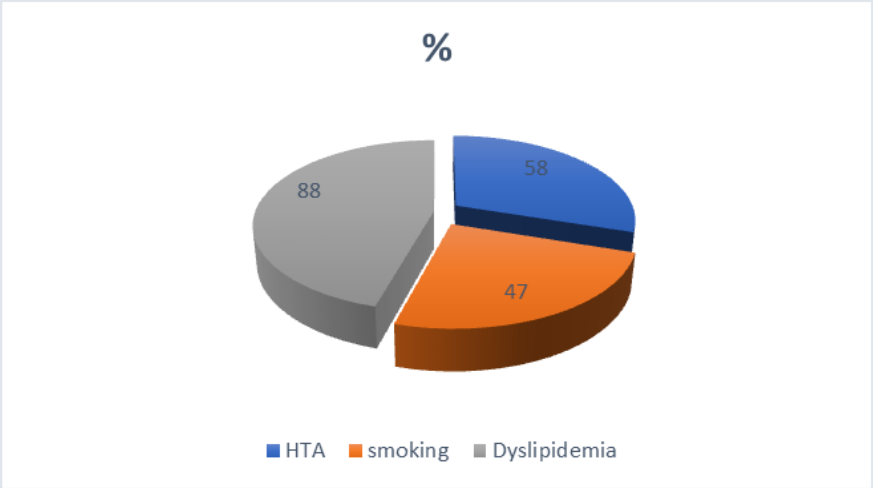

Figure 1: The main cardiovascular risk factors

Electrocardiographic characteristics

In our study we found in group I, above ST shift (55, 8%), under ST segment (20, 8%), negative T wave (17, 6%) and QS (5, 8%).

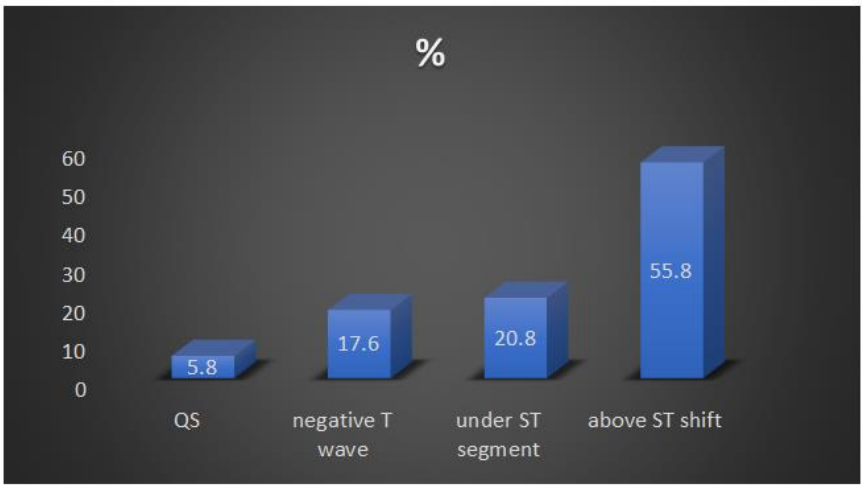

Figure 2: Electrocardiogram aspects

The main electrical territories were in group I comparatively with groupe II.

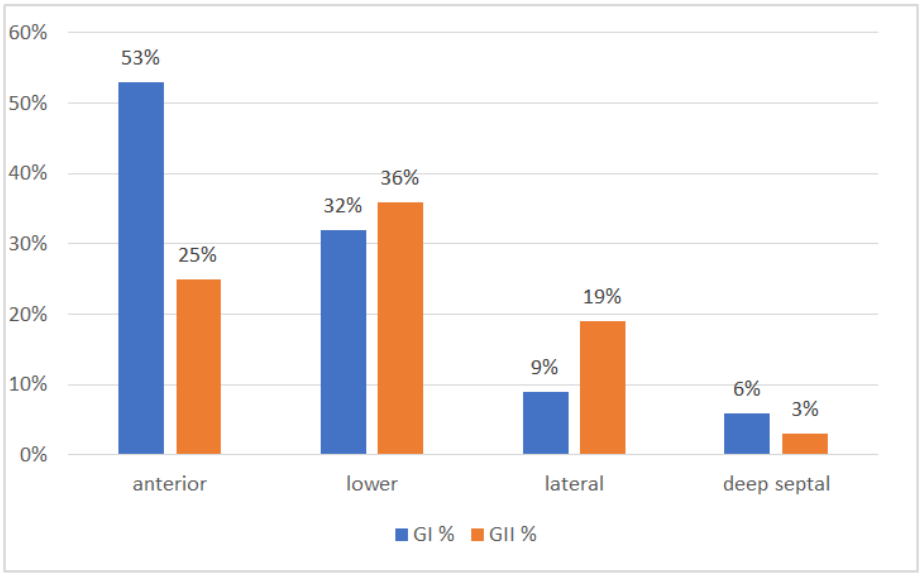

Figure 3: Electrocardiogram topography

Angiographic characteristics

In our study, we found in group I, multi vessel lesion (78%) and single vessel (22%) while in group II, we found multi vessel (59%) and single vessel (41%).

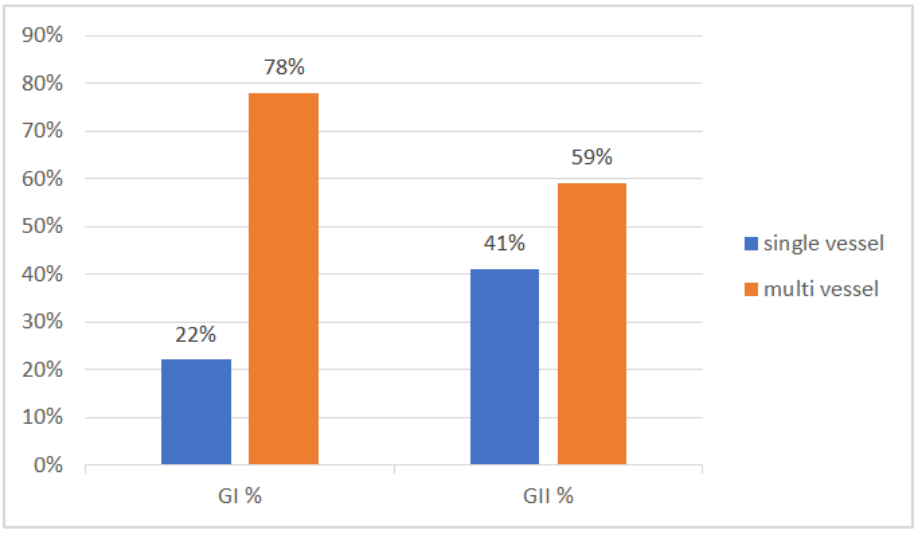

Figure 4: Angiographic characteristics

DISCUSSION

limitation of the study

This study has several limitations. It was based on prospectively analyzed data from the records of patients hospitalized during the study period. This period of study was very short. The number of patients was relatively small, in contrast with international registries. Nevertheless, this preliminary work will provide data in our department of cardiology.

Epidemiological characteristics and risk factors

The median age in the GI group was 58 years ± 8, 7 years with extremes of 41 years and 78 years. In the GII group it was 62.6 ± 6, 7 years, the analysis shows a significant difference in age between the two groups ($p<0.04$). Male predominance is the same in both groups with no significant difference. In the WHO study, the average age of onset of ischemic heart disease in type II diabetes was 50 years [2].

The age of diabetes was 8.7 ± 5.7 years (1 month – 19 years) of which approximately 62% of patients were on insulin therapy. The glycemic imbalance was judged on the basis of glycated hemoglobin, the average was 8.7%. We did not find any work correlating a high HBAIC rate and the severity of the lesions all based on empirical assumptions. In the GI group diabetes was more often associated with HTA in 58.6% of cases and dyslipidemia in 88% in favor of the LDL fraction. These data corroborate the literature,

FATINI had recovered 57.9% and 70% respectively in 2011 [3].

In the GII group, the predominance of smoking was more striking with 72% of patients the data are similar to those of the literature.

Electrocardiographic and echographic aspects

In the GI group we observed left ventricular dysfunction in 52% of patients while it represented 20% in the GII group. This can be explained by the effect of specific cardiomyopathy of diabetics and by the effect of cardiac autonomous neuropathy which itself participates in the diastolic and systolic dysfunction of the left ventricle [4, 5].

In the GI group, the anterior territory was the most affected on the electrocardiogram or 52% of cases against 25% in the GII group (p = 0.05) while for the lower territory the proportions were the same respectively 32% and 36%.

Angiographic characteristics

Multi-struncal involvement was more common in the GI group at 59%. Goraya *et al*., [5] showed from an autopsy study conducted in 293 diabetics and 1736 non-diabetics a multi-truncated involvement observed in 58% of diabetics compared to 41% of non-diabetics (p<0.01). Similar results were reported by Ledru *et al*., [6] from an angiographic study in 93 diabetics and 373 non-diabetics. This is explained by the fact that diabetes alone accentuates the atheromatous process by causing endothelial dysfunction and by amplifying the inflammatory reactions involved in atherosclerosis. Lipid-rich atherosclerotic lesions and a significant inflammatory component are associated with ruptures of Moreno's work [7] in 2000 quantified the lipid composition and macrophagic infiltration of coronary lesions in diabetic patients compared to a non-diabetic population. The presence of thrombus was also higher in diabetics than non-diabetics (62% vs. 40%; p= 0.04). The differences, very significant in terms of lipid-rich atheroma and macrophagic infiltration in the diabetic subject, increase the risk of plaque rupture and vulnerability for coronary thrombosis. Structural and functional abnormalities of platelets are constantly present with in particular an increase in the expression of GP IIbIa receptors on the platelet surface [8]. We also observe the increase in the concentration of the pro-coagulants: PAI1, fibrinogen, factor VII, Willebrand factor VIII and the decrease in the concentration of the endogenous anticoagulant substances: protein C, antithrombin III. Angiographically, coronary involvement is diffuse and predominantly distal, with long lesions as well as a high prevalence of tritroncular and left coronary stem lesions. The syntax score [9, 10], often high, reflects the severity and spread of lesions with sometimes chronic occlusions that are accompanied by excess mortality. Plaque with thrombosis responsible for the causes of mortality in diabetes [11, 12].

CONCLUSION

The ACS represents a vital emergency. The presence of diabetes is a factor of bad prognosis on the functional level by the existence of pluri-truncal lesions despite therapeutic advances.

Conflicts of Interest: The authors declare no conflicts of interest regarding the publication of his paper.

Ethics considerations: The patients of this study have been informed and their oral and written consent has been obtained.

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