Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medical Sciences

Angiographic Aspects of Ischemic Heart Disease in Diabetic Patients

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DOI: https://doi.org/10.36347/sjams.2025.v13i09.005 | **Received:** 18.06.2025 | **Accepted:** 23.08.2025 | **Published:** 04.09.2025

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Abstract **Original Research Article**

The prevalence of diabetes continues to increase worldwide, reaching record levels as it will affect 10.9% of the global adult population by 2045, therefore, constituting a real public health problem. The impact of diabetes on cardiovascular health has been proven with a two- to fourfold increased global cardiovascular (CV) risk compared with those without diabetes, due to macrovascular and microvascular damage indicating a rigorous management of this cardiovascular risk. Ischemic heart disease remains as the principal comorbid condition and primary contributor to mortality in patients with diabetes mellitus. Compared with nondiabetics patients with coronary disease, patients with diabetes have more extensive lesions and more silent episodes of ischemia. Thus, diabetics have more progressive coronary disease and poorer survival than nondiabetic coronary patients. The aim of our work is to document the different angiographic aspects and particularities of coronary disease in diabetic patients.

Keywords: ischemic cardiac disease – angiography – diabetes.

INTRODUCTION

Ischemic heart disease is a major cause of morbidity and mortality among patients with diabetes. Compared to non-diabetics with coronary artery disease, diabetics have more extensive lesions and more silent episodes of ischemia. Thus, diabetics have more progressive coronary disease and poorer survival than non-diabetics with coronary artery disease. Although the treatment of diabetics may seem similar to that of non-diabetics, some specific results should be reconsidered in the diabetic population, such as the place of coronary revascularization and the treatment of associated risk factors, in particular dyslipidemia.

MATERIALS AND METHODS

This is a retrospective cross-sectional study conducted in the cardiology department of the military hospital on 60 diabetic patients who had undergone coronary angiography, identified between January 2017 and December 2018.Data were collected and processed by JAMOVI software.

The qualitative parameters were described in numbers and percentages, the quantitative parameters in mean ± standard deviation if the distribution is Gaussian, in median and interquartile ranges if the distribution is skewed. The distribution of quantitative parameters was tested by the Gaussian curve and the Shapiro Wilk test. The comparison of groups for quantitative variables was performed by the student t test and the Mann Whitney test, and for qualitative variables by the chi-square test and the Fisher exact test. The significance level was set at 5%. Statistical analyses were performed using Jamovi 2.2.336 software.

RESULTS

The mean age of our patients was 59±4.9 years with a female predominance (62.5%). In our series: 54% of patients had 3 or more cardiovascular risk factors. They were mainly type 2 diabetes mellitus (90.4%) with a mean duration of 6 years [3-15years]. In terms of microangiopathy, 2% of the patients had known retinopathy and nephropathy. 29.7% of patients had a history of ischemic heart disease.

The indication for coronary angiography was stable angina in 42%, silent ischemia in 20%, dilated cardiomyopathy in 12%, and acute coronary syndromes in 26%. Coronary angiography found bitroncular lesions in 41.6%, tritroncular lesions in 33.3%, and monotroncular lesions in 25% of cases.

Comparative analysis of bicoronary lesions showed the frequent association of lesions in the LAD and LCX (47.06%) followed by the association of LAD and RCA (35.29%).

Patients had an average of 1.74 lesions per patient and an average of 2.3 lesions per artery with an estimated 30% proximal and 40% distal involvement and 25% simultaneous proximal and distal involvement.

Figure 1: Results of localizations

Localization	Percentage
LAD	52.2 %
RCA	30.1 %
LCX	10.2 %
LCA	3 %
DIAGONAL	2.2 %
MARGINAL	2.2 %

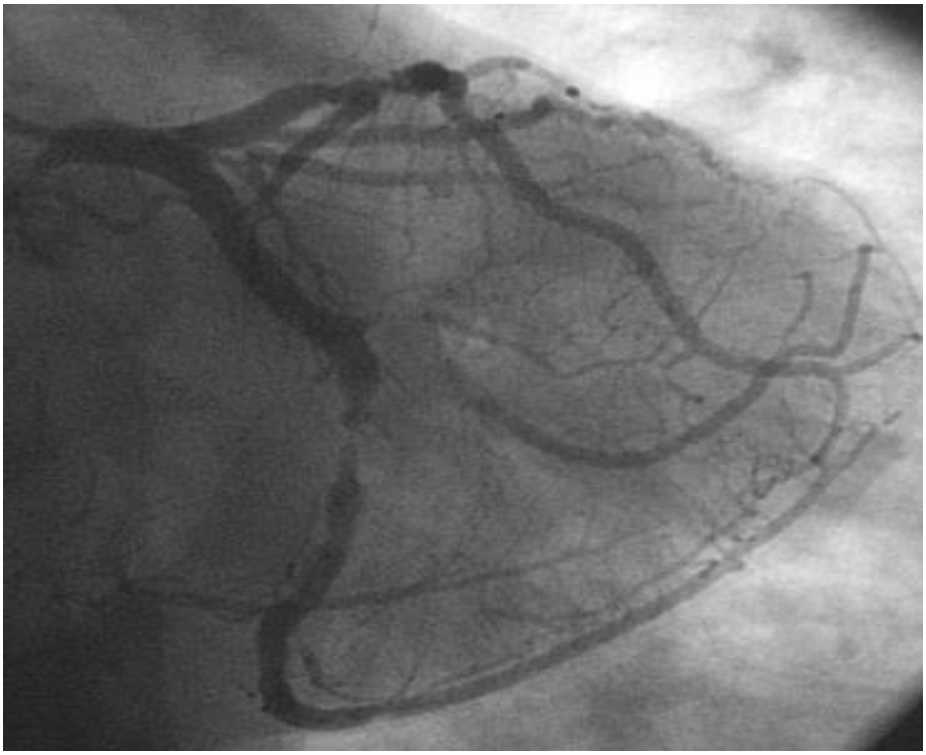

Figure 2: The coronagraphy of one of our patients

DISCUSSION

Coronary artery disease (CAD) is one of the major cardiovascular diseases affecting the global human population. This disease has been proved to be the major cause of death in both the developed and developing countries. [1] Current literature indicates that diabetic subjects are at risk of having coronary events alike non-diabetic subjects, who previously had one [2].

According to Goraya and al, diabetes is commonly associated with increased atherosclerosis [3]. Besides, coronary lesions seem to be more severe and more extensive, with a frequency of moderate lesions at high risk of rupture. Angiographic studies show that patients with diabetes are more likely to have left main and multivessel CAD, and diffuse and small vessel disease. [4]

Abaci and al, showed that coronary collateral vessel development is poorer in patients with than in patients without DM whilst the number of affected vessels is higher among patients with diabetes. [5]

In our study, the coronary involvement is pluritroncular, distal and more extensive, in line with the results reported in NHLBI Dynamic Registry of Percutaneous Interventions. [6]

In addition, these results demonstrated that moderate stenosis, considered to be at high risk of rupture, worsens the outcome of patient as the collateral vessels are not developed.

Complex coronary lesions are frequent with higher frequency of long irregular lesions and bifurcation which makes the coronary damage in diabetic patients more serious and more severe.It is also associated with a

high risk of progression and instability that influences the prognosis and the response to revascularization.[7]

The clinical presentation appears to concern both stable and unstable coronary artery disease, with a high mortality during the follow-up of these patients. This was demonstrated in a meta-analysis of 60,000 patients where diabetes increased the risk of 1-year mortality by 70% for STEMI and 20% for NSTEMI. [8] Although, there is a high risk of complications in this fragile population: bleeding complications may occur following the administration of antiplatelet agents; renal complications due to iodine-induced nephropathy during coronary angiography; and finally procedural complications after revascularization with a high risk of intra-stent restenosis, which is frequently occlusive, and thrombosis. [7]

Thus, an "aggressive" management of these high cardiovascular risk patients should be favored. First, medical treatment with optimal management of other cardiovascular risk factors and antiplatelet therapy focused on thrombotic risk. Then a revascularization strategy that must be certainly "aggressive", but individualized to each diabetic coronary patient in order to be the most optimal. [6,7]

CONCLUSION

Coronary disease in diabetics is frequent. It is related to pluritroncular, and distal lesions associated with frequent moderate stenoses, a higher rate of occlusion and a poorly developed collateral circulation. These characteristics explain the frequency and severity of this complication in diabetic patients.

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