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### RESEARCH ARTICLE

#### IMPACT OF TYPE 2 DIABETES IN NON ST-ELEVATION MYOCARDIAL INFARCTION (NSTEMI).

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#### Abstract

**Objectives:** The aim of this work is to expose the experience of our center in managing severe multi vessel coronary artery disease in diabetic NSTEMI patients.

**Methods:** This is a retrospective study of 105 patients admitted for a high risk non ST-Elevation Myocardial Infarction (NSTEMI) to the cardiology department of the military hospital, Rabat, Morocco. Data was collected from January 2013 to December 2014.

We enrolled patients in two groups: Group 1: diabetic patients (N 53) and Group 2: non-diabetic patients (N 52).

**Results:** The mean age was almost comparable between the 2 groups: 62 years in diabetics against 60 years in non-diabetics. The mean diabetes duration was about 8.6 years. Diabetic patients are more likely to develop arterial hypertension; smoking is the most important cardiovascular risk factor in non-diabetic group. Tri-truncular coronary lesion was more frequent in diabetics (55%), whereas non-diabetic patients had more mono-truncular lesions (53%). 59% of diabetic patients underwent PCI vs 53 % in non diabetic group, 26% of diabetic patients underwent CABG. 15% of diabetic group and 16% of non diabetic group were managed by medical treatment only. For in-hospital MACE, there were no significant differences in outcomes between the 2 groups. (Group1 : 10,4% vs Group 2 : 10,5%, p :0,6).

**Conclusions:** In diabetic NSTEMI patients, coronary artery disease was more severe; in our center, PCI was non inferior in term of intra hospital MACE compared to CABG.

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## Introduction:

Type 2 diabetes is a life threatening disease. More than 80% of deaths occur in low and middle-income countries. In 2030, World Health Organization (WHO) predicts that diabetes will be the seventh leading cause of death worldwide and the number of affected patients will reach approximately 560 million [1].

In Morocco, the latest data estimates that 1,5 million people suffer from diabetes and that the prevalence exceeds 14% in adults > 50 years [2].

Diabetes increases the risk of acute coronary syndrome (ACS) and worsens the prognosis [3–6].

The objective of our study is to evaluate the impact of type 2 diabetes on patients with high risk NSTEMI.

## Material and Methods:

This is a retrospective study of 105 patients admitted for a High risk Non ST-Elevation Myocardial Infarction (NSTEMI) to the cardiology department of the Military Hospital, Rabat, Morocco. Data was collected from January 2013 to December 2014.

We enrolled patients in two groups: Group 1: Diabetic patients (N53) and Group 2: Non diabetic patients (N52).

The high risk NSTEMI diagnosis was based on the definition ESC guidelines:

1. Presence of chest pain described as one of the following criteria:

Prolonged (20 min) anginal pain at rest;

New onset (de novo) angina (class II or III of the Canadian Cardiovascular Society classification)

Recent destabilization of previously stable angina (crescendo angina); or Post-MI angina

2. One or more of the following criteria:

Rise or fall in cardiac troponin compatible with MI

Dynamic ST- or T-wave changes (symptomatic or silent)

GRACE score >140

## Data has been collected:

1. On the basis of the hospital medical file filled out by the treating physicians.

2. Based on the register of the catheterization room.

All patients received pre-treatment with aspirin (loading dose: 200 mg) and clopidogrel (loading dose: 300 mg or 600 mg). All procedures were performed under effective intravenous heparin anticoagulation according to standard regimens.

## Results:

### 1. Clinical characteristics:

Clinical characteristics are summarized in (Table 1). The mean age was almost comparable between the 2 groups: 62 years in diabetics against 60 years in non-diabetics. The mean duration of diabetes was about 8.6 years.

Diabetic patients seem to be more likely to develop arterial hypertension- Smoking is the most important cardiovascular risk factor in non-diabetic group.

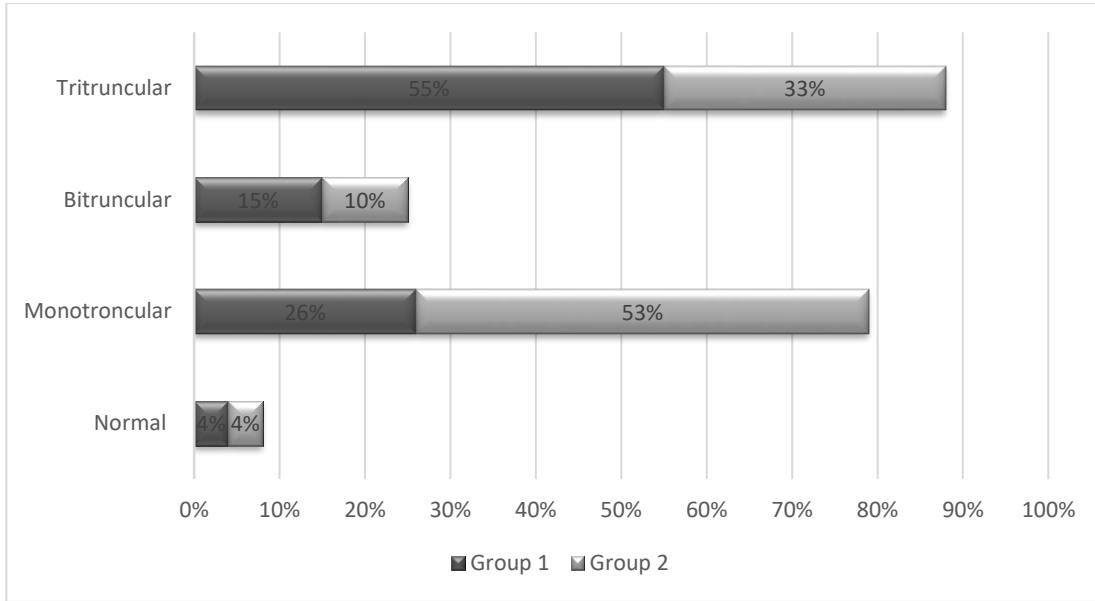
**Table1:** Clinical characteristics.

Cardiovascular risk factors	Group 1 N(%)	Group 2 N(%)
Hypertension	29 (54,7%)	18 (34,6%)
Smoking	18 (34%)	34 (65,4%)
Dyslipidemia	14 (26,4%)	10 (19,2%)
Obesity	12 (22,6%)	8 (15,3%)
Hereditary CAD	3 (5,6%)	5 (11,9%)

CAD: Coronary Artery Disease

**2. Angiographic findings:**

The angiographic findings are summarized in (Figure 1). Tri-truncular coronary lesion was more frequent in diabetics (55%), whereas non-diabetic patients had more mono-truncular lesions (53%).

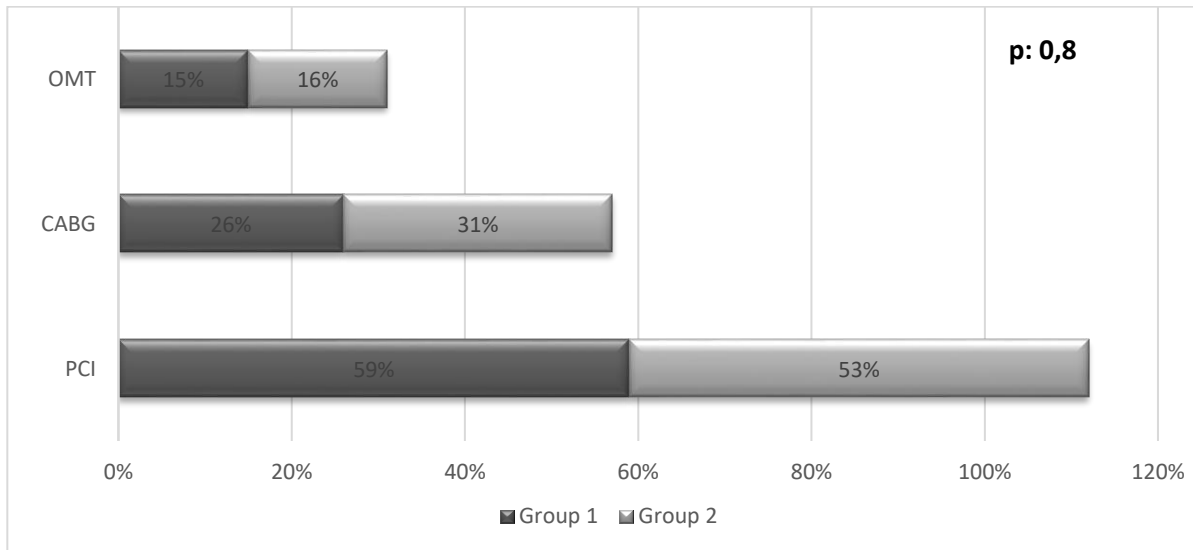


**Figure1:** Angiographic findings

**3.Revascularization strategy:**

59% of diabetic patients underwent PCI vs 53 % in non-diabetic group, there was also no significant difference in the two groups concerning surgical management.

15% of diabetic group and 16% of non-diabetic group were managed by only medical treatment.



OMT: Optimal medical treatment; CABG: Coronary Artery Bypass Grafting; PCI: Percutaneous Intervention

**Figure 2:** Revascularization strategy

#### 4. Intra-hospital MACE :

No significant difference in term of MACE was observed between the 2 groups (Group1 : 10,4% vs Group 2 : 10,5%, p :0,6).

#### Discussion:

Diabetes has always been described as a risk factor of coronary heart disease. The link between the pathogenesis of diabetes and atherosclerosis is explained by insulin resistance phenomenon, which causes dyslipidemia and hyperglycemia, leading to reduced nitric oxide synthesis in blood artery walls [7].

Thus, coronary lesions are more extensive, with a higher rate of tritroncular lesions as found in our study: 55% of diabetic patients presented with tritroncular lesion. The lesions are also significantly longer, located in distality with a bad downstream quality, which explains the use of incomplete or less aggressive revascularization. [8]

The revascularization strategy is still shared between the Coronary Artery Bypass Grafting (CABG), multi-stage PCI or even Optimal Medical Treatment (OMT). Indeed, due to the lack of large randomized trials, the choice between these strategies remains difficult. It depends on the severity of atherosclerosis, the anatomy of coronary arteries, the composition and location of lesions, the presence of comorbidities, including diabetes [9,10]. Hlatky et al. analyzed data of 7812 patients from 10 randomized trials, comparing the effectiveness of CABG vs PCI in diabetic type 2 patients with multivessel coronary artery disease, showed in long-term follow-up the superiority of CABG [11].

In a large meta-analysis of 6 randomized trials (MASS II, FREEDOM, BARI, SYNTAX, CARDia, Kmlsh) comparing long-term adverse clinical outcomes of CABG vs PCI in insulin-treated type 2 diabetic patients, CABG was significantly better than PCI but there was a higher rate of stroke in CABG group [12]. CABG seems to be the effective strategy in managing multivessel coronary artery disease in diabetic patients, especially if the SYNTAX score is >22 as recommended by 2018 ESC/EACTS Guidelines of myocardial revascularization [13].

In our study, only 26% of diabetic patients underwent CABG, and almost 60% had PCI. No significant difference in MACE or rehospitalization rate was noticed (Group1 : 10,4% vs Group 2 : 10,5%, p :0,6).

The multicentric NCDR ACTION Registry-GWTG reported almost similar results : 74 941 diabetic patients hospitalized for NSTEMI ACS, coronary angiography analysis showed multivessel coronary disease. The patients were enrolled into 3 groups based on the revascularization strategy : 46.2% had PCI with Drug Eluting Stent (DES) implantation, 17.3% were managed by OMT, and only 36,4% underwent CABG. Surgery was used in selected patients (Left main coronary artery disease (LM) and proximal left anterior descending (LAD) coronary artery stenosis) [14].

#### Conclusion:

In diabetic NSTEMI patients, coronary artery disease was more severe; In our center, PCI was non inferior in term of intra hospital MACE compared to CABG.

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