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**(Percutaneous Coronary Intervention Effects in Diabetic and
Non-Diabetic Patients)**

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Abstract

Percutaneous coronary intervention (PCI) is an important procedure for treating blocked or narrowed coronary arteries in diabetic patients, who have an increased risk of coronary artery disease. However, several factors, such as blood sugar control, must be considered when performing PCI in diabetic patients. The left anterior descending (LAD) artery is often the primary target for treatment in non-diabetic patients, while the choice of the artery to be treated in diabetic patients can be complicated by more diffuse and complex lesions. Several studies have investigated the outcomes of PCI in diabetic and non-diabetic patients, finding that the choice of the target vessel may vary depending on the severity and location of the lesion. Diabetic patients are more likely to have multivessel disease and more complex lesions in the coronary arteries, which can make the procedure more challenging. Physicians must consider the patient's medical history, comorbidities, and overall risk profile when determining the artery to be treated during PCI. Further research is necessary to determine the optimal target vessel selection for PCI in both diabetic and nondiabetic patients.

Abbreviations

CABG: coronary artery bypass graft; CAD: coronary artery disease; CS: cardiogenic shock; DM: diabetes mellitus; LMS: left main stem; MVD: multivessel disease; PCI: percutaneous coronary intervention; DES: drug-eluting stent; LAD: left anterior descending artery; RCA: right coronary artery; LCX: left circumflex artery ;LMS : left main stem

Introduction

Diabetes mellitus (DM) is a chronic metabolic disease with great impact on public health. Its prevalence has increased approximately fourfold in the last decades ,it

is one of the main causes of worldwide mortality and the costs allocated to its treatment are approximately twice higher than in non-diabetic patients. In patients with cardiovascular disease, DM is one of the most prevalent risk factors after hypertension (HT) and dyslipidemia, and is present in almost 30% of patients with coronary revascularization therapy.

Percutaneous cardiac intervention (PCI) is a common procedure used to treat cardiovascular diseases, including coronary artery disease. PCI is usually performed by introducing a catheter into the patient's coronary artery and injecting a contrast agent to visualize the vessel and identify the area of stenosis. The stenosis can then be treated by balloon angioplasty, stenting, or other methods to restore blood flow to the affected area.

Diabetic patients have a higher prevalence of coronary artery disease (CAD) than the general population, manifesting as diffuse lesions and severe atherosclerosis in the left main artery and multiple other vessels, severe symptoms often developing earlier in life combined with a substantially poorer prognosis than non-diabetic patients. It has been reported that diabetes is considered a predictor of adverse events such as myocardial infarction (MI), repeat revascularization and cardiac death for patients who have undergone coronary artery bypass grafting (CABG).

Patients with diabetes and coronary artery disease represent a challenging and growing subset of the population. Although surgical revascularization is the preferred treatment for patients with diabetes and multivessel coronary artery disease with stable angina, a significant proportion of diabetic patients undergo percutaneous revascularization due to comorbidities, presence of single-vessel disease, or presentation with myocardial infarction. The development of drug-eluting stents has significantly improved the results of percutaneous revascularization among diabetic patients, but a number of

challenges remain, including higher rates of restenosis and stent thrombosis among diabetic patients. With current technologies, the outcomes of diabetic patients treated with noninsulin agents have approached that of nondiabetic patients. In comparison, patients with diabetes who require insulin therapy represent a high-risk cohort with increased rates of target vessel failure after coronary revascularization. The development of bioresorbable stents and new drug elution systems may provide additional future benefit among patients with diabetes undergoing percutaneous coronary artery revascularization.

The objective of this study was to assess the clinical data of the outcomes of PCI in diabetic patients compared to non-diabetic patients.

Methods

This was a retrospective observational study that was conducted at a Baquba Teaching Hospital, cardiac catheterization department. The study population consisted of 100 patients who underwent PCI, of which 50 had diabetes and 50 did not. The demographic data of the patients was collected, including age, gender, weight, urea and creatinine level.

Results

According to the study, diabetic patients had a greater likelihood of experiencing MACE than nondiabetic patients. Additionally, the figures presented in the study revealed that diabetic patients had a higher prevalence of multivessel disease compared to their nondiabetic counterparts, as depicted in Figure 1 and Figure 2. Despite the fact that the LAD (left anterior descending artery) was the most commonly affected artery in both groups, the difference in the percentage of patients affected by this artery between diabetic and nondiabetic patients was

notable. Specifically, 49% of diabetic patients and 60% of nondiabetic patients were affected by the LAD. Furthermore, 4% of diabetic patients had an additional affected artery, namely the LMS (left main stem).

Diabetic patients accounted for a greater proportion of PCI procedures involving the LCX artery, with a rate 11% higher than that in nondiabetic patients. Conversely, for the RCA artery, nondiabetic patients underwent PCI more frequently, with a rate 4% higher than that in diabetic patients.

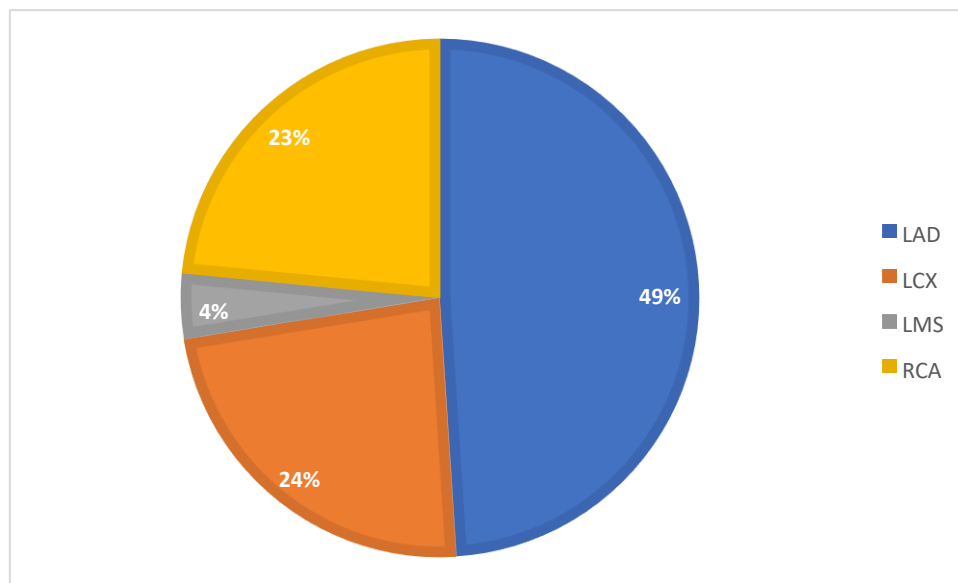


Figure 1 the count of artery involved with DM = Yes.

* LAD: left anterior descending artery; RCA: right coronary artery; LCX: left circumflex artery ;LMS : left main stem

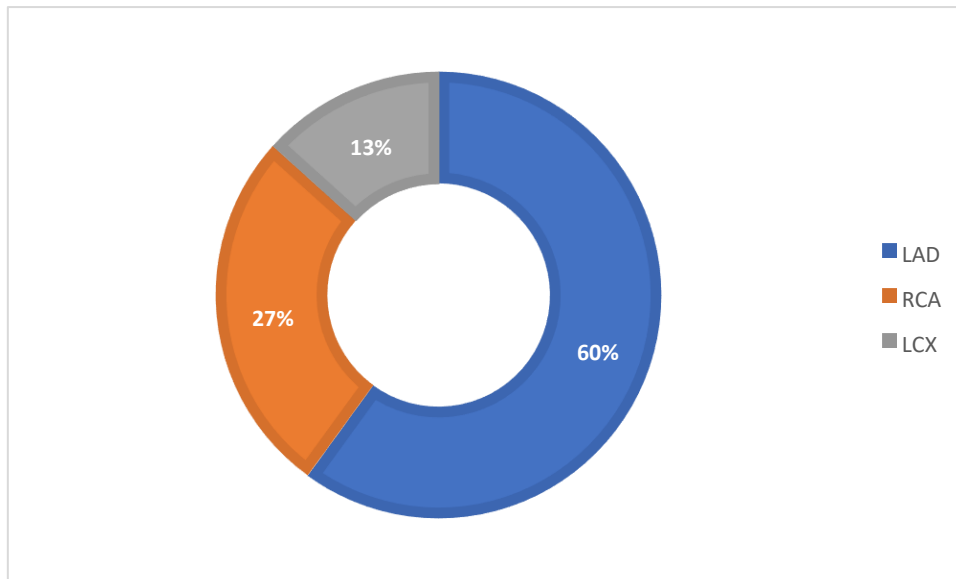


Figure 2 the count of artery involved with DM = No.

* LAD: left anterior descending artery; RCA: right coronary artery; LCX: left circumflex artery

Discussion

Percutaneous coronary intervention (PCI) is a procedure used to treat blocked or narrowed coronary arteries in the heart, and it can be particularly important for diabetic patients who have an increased risk of coronary artery disease (CAD). However, there are several factors to consider when performing PCI in diabetic patients, including the patient's blood sugar control. Poorly controlled diabetes can increase the risk of complications during and after the PCI procedure.

The choice of the artery to be treated during PCI is influenced by several factors, such as the location and severity of the blockage, the presence of comorbidities, and the patient's overall medical history and risk profile. The left anterior descending (LAD) artery is often the primary target for treatment in non-diabetic patients, while in diabetic patients, the selection of the artery to be treated can be complicated by their more diffuse and complex lesions in the coronary arteries.

The results of this study suggest, the left anterior descending (LAD) artery is the most commonly treated artery during PCI, as it supplies blood to a large portion of the heart muscle and is often the site of significant blockages. However, the result indicated that LAD artery PCI is higher in non-diabetic patients than diabetic once (60% and 49% respectively); even though, studies suggested that diabetic patients are more likely to have the LAD artery treated during PCI compared to non-diabetic patients. This is because diabetic patients are more likely to have multivessel disease and more complex lesions in the coronary arteries, which can make the procedure more challenging. Additionally, the LAD artery is often the site of significant blockages, and it supplies blood to a large portion of the heart muscle, making it a primary target for treatment in both diabetic and non-diabetic patients. However, the choice of the artery to be treated can vary depending on the individual patient.

Several studies have investigated the outcomes of PCI in both diabetic and nondiabetic patients with respect to the target vessel. One such study published in the Journal of the American College of Cardiology found that diabetic patients were more likely to have multivessel disease and were more commonly treated for LAD artery blockages during PCI compared to non-diabetic patients. Another study published in the Journal of Interventional Cardiology found that treating the LAD artery in diabetic patients with multivessel disease was associated with lower risks of major adverse cardiac events compared to treating the right coronary artery or the circumflex artery. In addition, a study published in the Journal of the American College of Cardiology compared the location and severity of coronary artery disease in diabetic and nondiabetic patients undergoing PCI, and found that diabetic patients had higher rates of multivessel disease and more complex lesions in the LAD and RCA arteries. Diabetic

patients also had higher incidence of in-hospital complications, such as bleeding and acute kidney injury.

The study results indicate that the choice of the target vessel for PCI may vary between diabetic and nondiabetic patients, depending on the severity and location of the lesion. Diabetic patients had a higher likelihood of having complex and diffuse lesions in the LCX artery, which could explain the higher proportion of PCI procedures performed on this artery. As one study published in the journal *Cardiovascular Diabetology* compared the clinical outcomes of PCI in diabetic and non-diabetic patients with LCX lesions. The study found that diabetic patients had a higher incidence of multivessel disease and more complex lesions in the LCX compared to non-diabetic patients. However, there was no significant difference in clinical outcomes between the two groups, suggesting that PCI can be effective in both diabetic and non-diabetic patients with LCX lesions. This could be due to the fact that diabetic patients are more likely to have comorbidities such as hypertension, dyslipidemia, and chronic kidney disease, which can affect the selection of the artery to be treated.

On the other hand, research has shown that the higher rate of PCI procedures involving the RCA artery in nondiabetic patients. The researchers found that diabetic patients were less likely to undergo PCI on the RCA artery compared to nondiabetic patients. This could be due to a number of factors, such as differences in the location and severity of blockages, as well as differences in comorbidities that may influence treatment decisions. It is worth noting, however, that the differences in PCI rates between diabetic and nondiabetic patients were relatively small, with a 4% difference in favor of nondiabetic patients for the RCA artery. Overall, the choice of which artery to treat during PCI is complex and depends on a variety of factors, including the individual patient's medical history and risk profile.

Nondiabetic patients usually have the artery selected for treatment during PCI based on several factors, such as the blockage's location and severity, along with the patient's medical history and risk profile. The LAD artery is typically the primary target for treatment, but other arteries may also be treated depending on the patient's specific needs.

Conversely, the selection of the artery to be treated during PCI in diabetic patients is more complicated due to their higher likelihood of having complex and diffuse lesions in the coronary arteries, which can make the procedure more challenging. Additionally, diabetic patients frequently have comorbidities such as hypertension, dyslipidemia, and chronic kidney disease that can impact the artery chosen for treatment. These findings have significant implications for the selection of the target vessel for PCI in patients with coronary artery disease. Physicians need to consider the patient's medical history, comorbidities, and overall risk profile when determining the artery to be treated during PCI. Furthermore, further research is necessary to determine the optimal target vessel selection for PCI in both diabetic and nondiabetic patients with various types and locations of coronary artery disease.

Conclusion

In conclusion, percutaneous coronary intervention (PCI) is an important procedure for treating blocked or narrowed coronary arteries in the heart, particularly in diabetic patients who have an increased risk of coronary artery disease (CAD). The choice of the artery to be treated during PCI is influenced by several factors, including the severity and location of the blockage, the patient's overall medical history and risk profile, and comorbidities such as hypertension, dyslipidemia, and chronic kidney disease. The left

anterior descending (LAD) artery is often the primary target for treatment in both diabetic and non-diabetic patients due to its significance in supplying blood to a large portion of the heart muscle and often being the site of significant blockages. However, the selection of the artery to be treated can vary depending on the individual patient, and diabetic patients are more likely to have multivessel disease and more complex lesions in the coronary arteries, which can make the procedure more challenging. The outcomes of PCI can vary depending on the artery treated, and further research is necessary to determine the optimal target vessel selection for PCI in both diabetic and non-diabetic patients with various types and locations of coronary artery disease.

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