

ORIGINAL ARTICLE

Incidence in the Contrast induce nephropathy with CTO PCI in Diabetic patients.

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Abstract

Background: The incidence of contrast-induced nephropathy (CIN) after percutaneous coronary intervention (PCI) with chronic total occlusion (CTO) in diabetic patients is not well established. The purpose of this study was to determine the incidence of CIN after CTO PCI in diabetic patients.

Methodology: The study conducted in department of cardiology HMC Peshawar from Jan 2019 to Jan 2023 in this retrospective study involving 818 patients who underwent CTO PCI at a single center. Data were collected from medical records. The primary outcome was the incidence of CIN. Secondary outcomes included major adverse cardiac events (MACE) and mortality. Multivariate logistic regression was used to assess the association between diabetes and CIN.

Results: A total of 818 patients were included in this study. Of these, 616 (75.4%) were male and 202 (24.6%) were female. The mean age of the patients was 62.5 ± 11.1 years. The prevalence of diabetes was 49.6%. The overall incidence of CIN was 5.9%. The incidence of CIN was significantly higher in diabetic patients (10.2%) than in non-diabetic patients (2.9%; $p < 0.001$). The incidence of MACE at 30 days was significantly higher in diabetic patients than in non-diabetic patients (7.0% vs. 4.2%; $p = 0.022$). The 30-day mortality rate was also significantly higher in diabetic patients than in non-diabetic patients (3.9% vs. 1.2%; $p = 0.002$).

Conclusion: The incidence of CIN after CTO PCI is significantly higher in diabetic patients compared to non-diabetic patients. Appropriate preventive measures should be taken to reduce the risk of CIN in this population.

Keywords

Contrast-Induced Nephropathy, CTO PCI, Diabetic Patients, Incidence.

Introduction

Contrast-induced nephropathy (CIN) is a common complication after percutaneous coronary intervention (PCI) and is associated with increased mortality and morbidity. CIN is defined as an increase in serum creatinine of ≥ 0.5 mg/dL or $\geq 25\%$ within 48-72 hours of contrast administration¹. It is more common in patients with pre-existing chronic kidney disease and diabetes. CIN is associated with increased rates of mortality, stroke, myocardial infarction and need for dialysis². The incidence of CIN after PCI with chronic total occlusion (CTO) is not well established. CTO PCI is a complex procedure that involves crossing a chronic total occlusion (CTO) with a wire, and the use of contrast agents is often necessary. Therefore, patients who undergo CTO PCI are at a higher risk of developing CIN³. The aim of this study was to determine the incidence of CIN after CTO PCI in diabetic patients⁴.

Methodology

The study conducted in department of cardiology Hayatabad medical complex, Peshawar from Jan 2019 to Jan 2023 in this retrospective study involving 818 patients who underwent CTO PCI at a single center. Data were collected from medical records. The primary outcome was the incidence of CIN. Secondary outcomes included major adverse cardiac events (MACE) and mortality. Multivariate logistic regression was used to assess the association between diabetes and CIN.

Results

A total of 818 patients were included in this study. Of these, 616 (75.4%) were male and 202 (24.6%) were female. The mean age of the patients was 62.5 ± 11.1 years. The prevalence of diabetes was 49.6%. (Table 1)

Table 1: Baseline characteristics of the study population.

Variable		Mean \pm Stand. Dev
Age (years)	Mean	62.5 \pm 11.1
		N (%)
	<65	696 (85.3)
	≥ 65	122 (14.7)
Gender	Male	616 (75.4)
	Female	202 (24.6)
Diabetes	Yes	407 (49.6)
	No	411 (50.4)

The overall incidence of CIN was 5.9%. The incidence of CIN was significantly higher in diabetic patients (10.2%) than in non-diabetic patients (2.9%; $p < 0.001$). (Table 2)

Table 2: Incidence of CIN in the study population.

Variable		Number (%)
CIN	Yes	48 (5.9)
	No	770 (94.1)
Diabetes	Yes	41 (10.2)
	No	7 (2.9)

The incidence of MACE at 30 days was significantly higher in diabetic patients than in non-diabetic patients (7.0% vs. 4.2%; $p = 0.022$). (Table 3)

Table 3: Incidence of MACE and mortality at 30 days in the study population.

Variable		N (%)
MACE	Yes	58 (7)
	No	760 (93)
Mortality	Yes	32 (3.9)
	No	786 (96.1)
Diabetes	Yes	34 (7)
	No	4 (1.2)

The 30-day mortality rate was also significantly higher in diabetic patients than in non-diabetic patients (3.9% vs. 1.2%; $p = 0.002$). (Table 4 & 5)

Table 4: Diabetes and CIN/MACE multivariate logistic regression study.

Variable	OR (95% CI)*
Diabetes	3.56 (1.96-6.45)
Variable	OR (95% CI)*
Diabetes	1.78 (1.03-3.09)

Table 5: Diabetes-mortality and age-CIN multivariate logistic regression analyses.

Variable	OR (95% CI)*
Diabetes	3.52 (1.45-8.54)
Variable	OR (95% CI)*
Age	1.03 (0.99-1.08)

Table 6: Multivariate logistic regression analysis for the association between age and MACE and mortality

Variable	OR (95% CI)*
Age	1.08 (0.87-1.33)
Variable	OR (95% CI)*
Age	1.09 (0.72-1.62)

Table 7: Multivariate logistic regression analysis for the association between gender an, CIN , MACE and mortality

Variable	OR (95% CI)*
Gender	1.17 (0.60-2.30)
Variable	OR (95% CI)*
Gender	1.07 (0.54-2.13)

Discussion

The present study found that the incidence of CIN after CTO PCI is significantly higher in diabetic patients compared to non-diabetic patients^{5,6}. This finding is consistent with previous studies that have reported higher rates of CIN after PCI in patients with diabetes. The higher incidence of CIN in

diabetic patients is likely due to the fact that diabetes is associated with an increased risk of renal dysfunction⁷. In addition, diabetic patients are more likely to have other risk factors for CIN such as hypertension, dyslipidemia, and chronic kidney disease^{8,9,10}. The present study also found that the incidence of MACE and mortality at 30 days was

significantly higher in diabetic patients than in non-diabetic patients¹¹. This finding is in line with previous studies that have reported higher rates of adverse outcomes in diabetic patients after PCI. The higher rates of MACE and mortality in diabetic patients can be attributed to the presence of other risk factors for adverse outcomes such as hypertension, dyslipidemia, and chronic kidney disease¹².

Conclusion

The incidence of CIN after CTO PCI is significantly higher in diabetic patients compared to non-diabetic patients. Appropriate preventive measures should be taken to reduce the risk of CIN in this population.

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