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Biodegradable-Polymer vs. Durable-Polymer Drug-Eluting Stents in Patients With Acute Myocardial Infarction

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BACKGROUND Drug-eluting stents (DES) have improved the outcomes of acute myocardial infarction patients (AMI) patients; however, the risk of late stent thrombosis with DES due to delayed healing of the vessel wall is still considerable. The aim of this study was to compare the safety and efficacy of biodegradable-polymer DES and durable-polymer DES in AMI patients undergoing percutaneous coronary intervention (PCI).

METHODS A total of 1312 patients with AMI who underwent PCI between 2004-2014 at Korea University Guro Hospital (KUGH) were enrolled. Patients were categorized into 2 groups according to the DES implanted: 1) Biodegradable-polymer DES (n=114), 2) Durable-polymer DES (n=1198). To adjust for any potential confounders, a propensity score matching (PSM) analysis was performed using the logistic regression model. Major adverse cardiac events (MACE), the composite of total death, myocardial infarction, stroke, and revascularization, were compared between the two groups up to 5 years.

RESULTS After PSM analysis, two groups (111 pairs, n=222) were generated with balanced baseline characteristics. There was no significant diffence between the 2 groups with regard to total death (HR 1.26; 95% CI: 0.34-4.71; P=0.724), cardiac death (HR 1.012; 95% CI: 0.204-5.016; P=0.988), myocardial infarction (MI) (HR 0.83; 95% CI: 0.254-2.72; P=0.762), total revascularization (HR 1.93; 95% CI: 0.50-7.48; P=0.339), stent thromosis (HR 4.32; 95% CI: 0.60-30.7; P= 0.143), and total MACE (HR 1.006; 95% CI: 0.480-2.11; P=0.987) (Table).

CONCLUSIONS In our study, there was no significant long-term individual and composite clinical outcome differences between the biodegradable-polymer DES and the durable-polymer DES in AMI patients underwent PCI up to 5 years of follow up.

Outcomes	Incidence of Event (%) at 5 Years				
	Biodegradable polymer DES (n:111)	Durable-polymer DES (n:111)	Log Rank	Hazard ratio (95% Confidence interval)	P value
Matched patients					
Total death	5 (4.5)	4 (3.6)	0.72	1.26 (0.34 -4.71)	0.724
Cardiac death	3 (2.7)	3 (2.7)	0.98	1.01 (0.20 -5.01)	0.988
Myocardial infarction	5 (4.5)	6 (5.4)	0.76	0.83(0.254 -2.72)	0.762
Revascularization	3 (2.7)	8 (7.2)	0.33	1.93 (0.50 -7.48)	0.33
Target lesion revascularization	3 (2.7)	7 (6.3)	0.03		
Non-target vessel revascularization	0 (0)	1 (0.9)	0.63		
Stent thrombosis	2 (1.8)	2 (1.8)	0.11	4.32 (0.60 -30.7)	0.143
Total MACE	14 (12.6)	14 (12.6)	0.987	1.00 (0.48 – 2.11)	0.98

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Prevention of Contrast-Induced Acute Kidney Injury by Remote Ischemic Peri-conditioning in Patients With Acute Myocardial Infarction and Reduced Left Ventricular Ejection Fraction

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BACKGROUND Contrast-induced acute kidney injury (CI-AKI) occurs frequently in patients with reduced left ventricular ejection fraction (LVEF) undergoing percutaneous coronary intervention (PCI). Although administration of intravenous fluid (IVF) is the cornerstone for prevention of CI-AKI, patients with reduced LVEF may not tolerate IVF. We assessed the impact of remote ischemic peri-conditioning (RIPC) during inter-facility helicopter transport on the incidence of CI-AKI following primary PCI in patients with ST-elevation myocardial infarction (STEMI) and reduced LVEF.

METHODS Data from the Acute Coronary Treatment and Intervention Outcomes Network Registry®-Get With the Guidelines™ (ACTION Registry-GWTG) from two PCI hospitals that were utilizing RIPC during inter-facility helicopter transport of STEMI patients for primary PCI between March 2013 and September 2015 were used for this study. The analyses were limited to inter-facility STEMI patients transported by helicopter with LVEF <55% after primary PCI. The outcome measure was incidence of CI-AKI, defined as ≥0.3 mg/dL absolute increase in creatinine within 48-72 hours after primary PCI.

RESULTS Out of 150 STEMI patients with low LVEF, 92 patients received RIPC and 58 did not. The RIPC and non-RIPC groups were generally similar in demographic and clinical characteristics. STEMI patients with low LVEF who received RIPC were less likely to have CI-AKI compared to patients who did not receive RIPC (6/92 [6.3%] versus 13/58 [22.4%]; OR=0.24, 95% CI 0.09-0.68, p=0.007). In a model adjusting for differences in baseline characteristics, RIPC remained independently associated with lower rate of CI-AKI (adjusted OR=0.24, 95% CI 0.07-0.83, p=0.024).

CONCLUSION RIPC is associated with reduced incidence of CI-AKI following primary PCI in patients with STEMI and reduced LVEF. Randomized clinical trials are needed to evaluate the role of RIPC as an alternative therapy for prevention of CI-AKI and associated adverse outcomes in patients with reduced LVEF and/or congestive heart failure.

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Predictors for 30-Day Readmissions in Patients Admitted With ST-Elevation Myocardial Infarction and Cardiogenic Shock: A 5-Year Nationwide Analysis

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BACKGROUND Management of ST-elevation myocardial infarction complicated by cardiogenic shock (STEMI-CS) has evolved in the last decade. There is a paucity of data on readmissions in this study population. We aim to assess the burden and predictors of 30-day readmissions in this population

METHODS This is a retrospective study using the National Readmission Database (NRD) from 2010-2014. All adult patients with an index admission for STEMI-CS were identified using ICD-9 Codes. Patients with mortality in index admission and transfers to other hospitals were excluded to estimate the burden of readmission

RESULTS A total of 18,659 admissions were identified with a primary diagnosis of STEMI-CSfor the study duration. Percutaneous coronary intervention (PCI) was performed in 78.1% and mechanical circulatory devices (MCS) were utilized in 2,403 (53.9%) with a mean length of stay of 10.6 days. Among these, 2,402 (12.9%) patients were readmitted within 30 days. Major etiologies for readmission include congestive heart failure (CHF) (25.7%), acute myocardial infarction (9.4%), arrhythmias (4.5%), and sepsis (4.2%). Age >75 years, female gender, diabetes, CHF, and utilization of MCS were significant predictors (c-statistic 0.64) for readmission. Moreover, patients with private insurance, discharge to skilled nursing facility and higher socioeconomic status were less likely to be readmitted within 30 days

CONCLUSION There is a significant burden of 30-day readmission among patients with STEMI-CS. PCI and MCS were utilized in a majority of index admissions. Presence of CHF and MCS use were predictors for readmission. Patients discharged to skilled nursing facilities and patients with private insurance and higher socioeconomic status were less likely to be readmitted