CRT-100.22

Outcomes of Percutaneous Coronary Intervention in Patients with Atrial Fibrillation Presenting With Acute Myocardial Infarction

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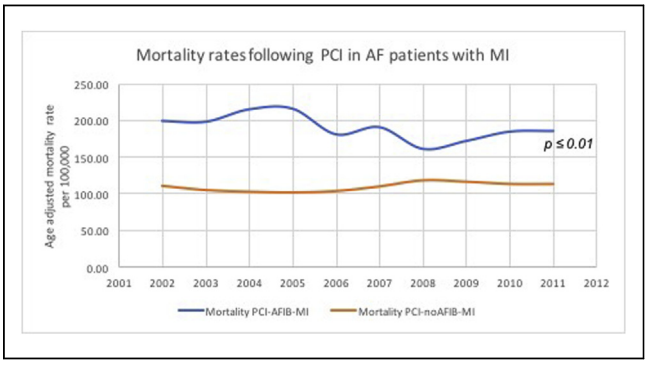
BACKGROUND Atrial fibrillation (AF) is common in patients presenting with myocardial infarction (MI). Percutaneous coronary intervention (PCI) has been shown to improve cardiovascular outcomes in MI. However, outcomes of PCI in AF patients presenting with MI remain largely unknown.

METHODS We analyzed the Nationwide Inpatient Sample (NIS) database to calculate the age-adjusted mortality rate for PCI in AF patients presenting with MI between 2002 and 2011, in adults over 40 years of age. This was then compared to the mortality rate for PCI in non-AF patients with MI. Specific ICD-9-CM codes were used to identify patients and outcomes.

RESULTS Of 3,226,405 PCIs done during the study period, 472,609 (14.6%) PCIs were done on AF patients, of which 137,870 PCIs were for MI. About 60% of these patients were male. Patients with AF were older (71.3±10.6 years). Overall, the number of PCIs showed a declining trend from 2002 to 2011, but for MI patients, the number of PCIs appeared stable over the years. The age-adjusted in-hospital mortality following PCI in MI was significantly higher in AF group compared to the non-AF group (190.24±17.21 vs. 109.08±5.89 per 100,000; p<0.01). These results are summarized in Figure 1. This trend was seen during the entire study period. The age-adjusted in-hospital mortality following PCI for stable coronary artery disease (CAD) was also significantly higher in AF group compared to non-AF group (65.18± 9.82 vs. 29.24±6.67 per 100,000; p<0.01).

CONCLUSIONS AF is prevalent in MI patients undergoing PCI. AF is associated with increased mortality following PCI for acute MI. AF is not a benign arrhythmia in MI patients, and close attention is warranted in these patients to improve mortality.



CRT-100.23

The Effect of Index Admission Revascularization on Readmission Over Time After Myocardial Infarction

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INTRODUCTION Readmission after myocardial infarction (MI) is a publicly reported quality metric. Readmission rates, however, are calculated independent of the treatment received while admitted for MI. We sought to evaluate the effect of revascularization on the risk of readmission after MI over time.

METHODS Patients who were discharged with a principal diagnosis of MI from January 2010 to January 2017 were retrospectively identified using our institutional billing system. Patients were separated by revascularization strategy during the index admission: percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG) and medical management. Readmission for any cause within 90 days of discharge was the primary endpoint. We calculated the instantaneous risk of readmission by revascularization strategy using a multiphase hazard model.

RESULTS Six thousand three hundred ninety-two patients were admitted 6693 times for a principal diagnosis of MI. One thousand four hundred twenty-nine patients were readmitted within 90 days for a total of 2137 readmissions. Of those readmitted, 224 underwent CABG, 633 received PCI, and 607 were medically managed. Six hundred seventy-seven (32%) of the readmissions occurred within 2 weeks of discharge. The risk of readmission is highest for all groups immediately after discharge, and this risk remained highest for those patients who received medical management throughout the follow-up period (p<0.0001) (Figure 1).

CONCLUSIONS Following an index MI, patients are most vulnerable for readmission immediately after discharge, and patients who are not revascularized represent the highest-risk group. Identifying why patients were not candidates for revascularization during the index admission, such as prohibitive comorbid risk, anatomy not suitable for revascularization or planned staged revascularization, may help explain their increased risk for readmission.

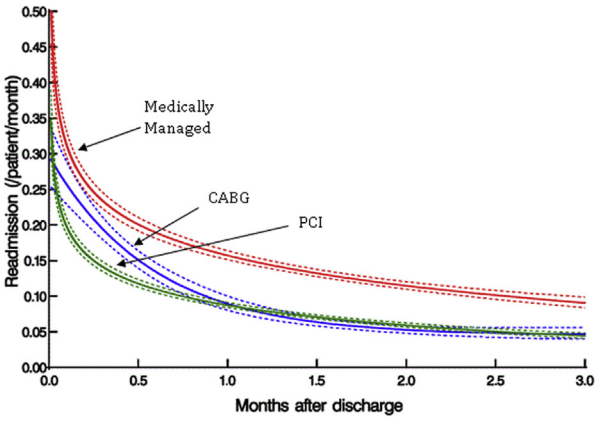

Figure 1. Instantaneous risk of readmissions after admission for myocardial infarction stratified by revascularization strategy: Medical Management (red); Coronary Artery Bypass Grafting (blue); Percutaneous Coronary Intervention (green). Solid line is the parametric estimates of the instantaneous risk of readmission enclosed within a 68% confidence interval.

CRT-100.24

Acute Myocardial Infarction in Patients with Paraplegia: Percutaneous Coronary Intervention or Coronary Artery Bypass Grafting?

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BACKGROUND Cardiovascular disease has become a leading cause of death for individuals with paraplegia. This is the first clinical study in the literature to investigate the clinical outcomes and treatment of AMI patients with paraplegia.

METHODS We identified AMI patients with paraplegia cohort by using principal diagnosis of AMI (ICD-9 codes 401.xx) and a concomitant diagnosis of paraplegia (344.1) and/or quadriplegia/tetraplegia (344.0) in New York State Inpatient Database (NY-SID) from 2007 to 2013.

Cardiac catheterization procedures with or without intervention were identified by procedural codes 37.22, 37.23, and 88.5x. PCI was identified by codes 00.66, 36.01, 36.05, 36.07, and 36.09. CABG by code 44. Propensity score (PS) matching analysis was used to compare outcomes of patients underwent various treatments adjusted for their comorbidities.

RESULTS Total of 1,400 patients with paraplegia were identified from 402,569 adult AMI admissions (3.5 per 1,000 admissions) with average age of 67.8±14.6 with 41% female, 65% white and 16% black. In addition to paraplegia, these patients have significant comorbidities such as hypertension (52%), diabetes mellitus (30%), and hyperlipidemia (25%). The overall in-hospital mortality was high (22.4%, 95% CI 20.2-24.6). The majority underwent medical therapy without a cardiac catheterization (1172 out of 1400, 83.7%), with 101 (7.2%) who underwent a diagnostic cardiac catheterization without revascularization, 100 (7.1%) who received PCI, and 27 (1.9%) patients who underwent CABG. Comparison of 127 treated with revascularization versus without (635 PS matched patients) found that revascularization was associated with lower mortality (9.5 (CI 4.3-14.6) vs. 22.0 (18.8-25.3), p <0.01), shorter LOS (13.0 (9.9-16.0) vs. 16.9 (15.1-18.8), p = 0.08), but higher hospital charges ($130,000 ($110,000-$150,000) vs. $92,000 ($84,000-$101,000), p <0.001). Comparison between PCI (115) and PS-matched CABG (23) found that PCI was associated with significantly lower mortality (1.7 (0-4.1) vs. 21.7 (4.5-38.9), p<0.001), shorter LOS (14.2 (11.2-17.1) vs. 24.8 (17.7-32.0), p<0.001) and lower hospital charges ($144,000 ($122,000-$167,000) vs. $231,000 ($183,000-$280,000), p<0.01).

CONCLUSION AMI in patients with paraplegia is a small but unique subgroup of AMI patients that deserves attention. These patients had high in-hospital mortality, low rate of using invasive diagnostic and treatment approaches. Propensity score matching analysis revealed that revascularization was associated with favorable outcome. PCI was associated with significantly better outcome than CABG.

Population Demographics and Procedural Characteristics (N=28)	
Demographics	**Result ± SD (%)**
Age	80.36 ± 4.36
Gender (Male)	17 (60.7)
Diabetes Mellitus	14 (50.0)
HTN	28 (100)
HLD	21 (75.0)
Hx of Stroke	3 (10.7)
Hx of MI	10 (35.7)
Hx of PCI	9 (32.1)
Hx of CABG	3 (10.7)
Echocardiograms	**N = 27 (96.4)**
Ejection Fraction	45.04 ± 15.79
Less than 30%	6 (22.2)
30% to 50%	9 (33.3)
50% or greater	12 (44.4)
Procedural Characteristics	**Result ± SD (%)**
IVUS	28 (100)
Procedural Success	28 (100)
Access	
Femoral	26 (92.9)
Radial	2 (7.1)
Location of Target lesion	N= 55 (% of patient population)
Prox RCA	5 (17.9)
Mid RCA	5 (17.9)
Distal RCA	2 (7.1)
PDA	1 (3.6)
Left Main	5 (17.9)
Prox LAD	18 (64.3)
Mid LAD	14 (50.0)
Distal LAD	1 (3.6)
Prox LCx	2 (7.1)
Mid LCx	2 (7.1)
Number of vessels targeted per case	
1	24 (85.7)
2	4 (14.3)
Burr Size	
1.25	7 (25.0)
1.5	13 (46.4)
1.75	4 (14.3)
2.0	2 (7.1)
2.15	1 (3.6)
2.25	1 (3.6)
Stents per case	
0	3 (10.7)
1	10 (35.7)
2	8 (28.6)
3	5 (17.9)
4	2 (7.1)
Type of Stent used by case	N=25 (% of patient population)
DES	22 (78.6)
BMS	3 (10.7)
Sheath Size (Fr)	
6	7 (25.0)
6.5	1 (3.6)
7	11 (39.3)
8	9 (32.1)
TIMI 3 flow	28 (100)
Procedural Support	
IABP	3 (10.7)
Temporary pacer	4 (14.3)
LVAD (impella)	2 (7.1)

Clinical Outcomes at 6 months (N=28)	
MACE (Cumulative Totals)	**Result ± SD (%)**
1 month	0 (0)
2 month	1 (3.6)
3 month	3 (10.7)
4 month	4 (14.3)
5 month	4 (14.3)
6 month	5 (17.9)
Lost to follow up at 6months	4 (14.3)
MACE (Clinical Events)	
Death	2 (7.1)
Sustained Ventricular Arrythmia	1 (3.6)
Myocardial Infarction	
STEMI	0 (0)
NSTEMI	2 (7.1)
Type 2 MI*	2 (7.1)
Target Vessel Revascularization	4 (14.3)
Stroke	0 (0)
Angiographic Complications	
Coronary Dissection/Tamponade	1 (3.6)
Hemorrhage, arterial access (impella)	1 (3.6)
Repeat Catheterization	6 (21.4)
Repeat Intervention Performed	3 (10.7)
Mean Time To Repeat Catheterization (days)	80.8 ± 52.7
Median Time To Repeat Catheterization (days)	60

*Type 2 MI is defined as: myocardial infarction secondary to ischemia due to either increased oxygen demand or decreased supply, e.g. coronary artery spasm, anemia, arrhythmia, hyperteension, or hypotension.

ATHERECTOMY DEVICES

CRT-100.28

Safety and Feasibility of Rotational Atherectomy in Elderly Patients with Severely Calcified Coronary Lesions: Clinical Outcomes at Six Months

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BACKGROUND In elderly patients, percutaneous coronary intervention (PCI) is associated with worse short-term outcomes and increased rates of angiographic complications. Furthermore, severe coronary artery calcification (CAC) decreases the probability of optimal PCI. Many patients with severe CAC benefit from lesion modification with rotational atherectomy (RA), however the safety and feasibility of RA in the elderly is not well-established.

METHODS We retrospectively identified all patients; age greater than 75, undergoing RA over a three-year period. Data regarding patient demographics, procedural characteristics, and incidence of major adverse cardiac events (MACE) was collected.

RESULTS Twenty-eight patients were included in data analysis. Demographic data, procedural characteristics, and clinical outcomes are reported in Table 1. Procedural success was achieved in all cases and no MACE occurred within 30 days of PCI. At 6 months, 17.9% (5/24) of patients had experienced MACE. The incidence of MACE was driven by NSTEMI, Type II MI, and target vessel revascularization. Two deaths were reported. One patient developed ventricular tachycardia while undergoing sigmoidectomy and the other was enrolled in hospice care for metastatic malignancy.

CONCLUSION RA is an indispensable tool in the elderly population, as they are more likely to have CAC and other comorbidities that limit their candidacy for surgical revascularization. In our population, RA was successful in all cases and procedural complications were rare. RA is a safe and feasible technique that should be considered in elderly patients with severe CAC.

CRT-100.29

Clinical Outcomes of Atherectomy Prior to Percutaneous Coronary Intervention in Patients on Dialysis (COAP-HD Study)

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BACKGROUND Lesion preparation is often essential in patients with coronary artery calcification (CAC) undergoing percutaneous coronary intervention (PCI). Patients with end-stage renal disease on hemodialysis have increased severity of CAC, increasing the complexity of PCI. There here have been no studies that have compared the head-to-head outcomes of dialysis patients undergoing orbital atherectomy (OA) compared to rotational atherectomy (RA).

METHODS This prospective, observational, multicenter study assessed OA vs. RA in dialysis patients with CAC. Thirty-five thousand five hundred ninety patients from 5 tertiary-care hospitals who had PCI between January 2011 and April 2016 were identified. Matched analysis of all dialysis patients who had OA or RA prior to PCI was performed (n=62).

RESULTS There were 31 patients in each cohort. There was no significant difference in the primary endpoint, death on discharge (0% vs. 3.2%, p=0.31). Multivariate adjusted analysis demonstrated no statistically significant differences in procedural and in-hospital outcomes (Table 1).

CONCLUSION Atherectomy in patients on dialysis, a complex, high-risk subset of patients, with CAC has not been well-studied. In this first head-to-head analysis of dialysis patients with CAC undergoing atherectomy prior to PCI, there were no significant differences between either modality, with low rates of procedural complications in both groups. Multicenter randomized studies are needed to confirm the optimal atherectomy strategy in this rarely studied patient population.