

Multivessel Versus Culprit Lesion Percutaneous Coronary Intervention in ST-Elevation Myocardial Infarction: Is More Worse?

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Objective

Existing data on the benefits of multivessel percutaneous coronary intervention (PCI) versus culprit lesion PCI during acute ST-segment elevation myocardial infarction (STEMI) are conflicting.

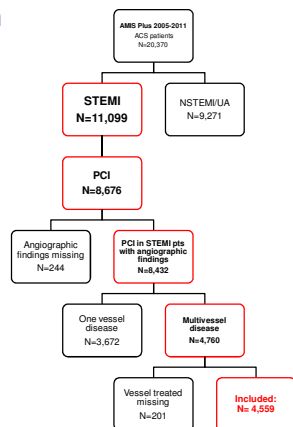
We examined the outcomes between STEMI patients with multivessel disease who underwent multi-lesion PCI (M-PCI) or single-lesion PCI (S-PCI).

Methods

AMIS Plus (*Acute Myocardial Infarction in Switzerland*) registry data were used. Patients admitted between 2005 and 2011 with a definite diagnosis of STEMI (clinical symptoms, ECG and/or elevated troponin levels according to the specific hospital cut-off for MI) who had multivessel disease and underwent PCI were included.

Multivariate logistic regression models were used to evaluate differences in in-hospital outcome.

Population



Results and Outcome

From 4,559 STEMI patients, 3,541 (78%) underwent S-PCI and 1,018 (22%) M-PCI. The decision regarding whether a S- or M-PCI was performed was at the discretion of the operating physician.

Baseline characteristics

	S-PCI (N=3541)	M-PCI (N=1018)	P value
Males	77%	80%	0.15
Age, mean yrs (SD)	65 (12)	64 (12)	0.31
Delay (h:min) median	3:00	3:10	
IQR	(1:43, 6:41)	1:50, 6:41	0.12
Resuscitation (prior)	5.8%	8.3%	0.007
Pain at admission	92%	92%	0.67
Dyspnea at admission	26%	32%	<0.001
Killip class >2	6%	12%	<0.001
Diabetes mellitus	19%	20%	0.37
Coronary artery disease	31%	28%	0.06
Hypertension	61%	58%	0.15
Dyslipidemia	54%	53%	0.47
Current smokers	43%	43%	1.00
Obesity (BMI >30)	20%	19%	0.22
Charlson Index ≥2	16%	18%	0.20
Left main involvement	3%	15%	<0.001

Immediate drug therapy

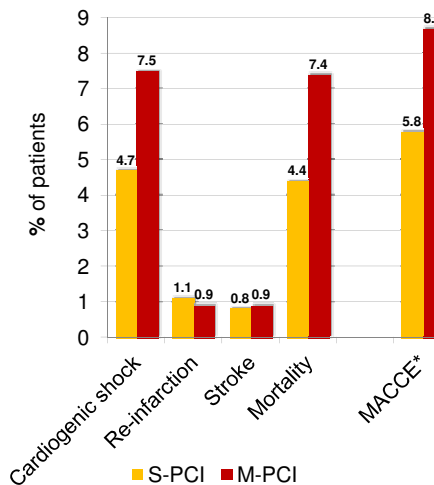
	S-PCI (N=3541)	M-PCI (N=1018)	P value
Aspirin	98%	99%	0.21
Thienopyridine	94%	94%	1.00
GPIIb/IIIa antagonists	40%	35%	0.002
Heparins	91%	90%	0.46
Beta-blocker	64%	60%	0.014
ACE inhibitor/AT antagonist	63%	50%	<0.001
Statin	81%	78%	0.049

Immediate therapy – within 24 hours

Predictors for use of M-PCI

	OR	95% CI	P value
Left main	5.49	4.20-7.18	<0.001
Female gender	0.88	0.73-1.1	0.16
Age (per year)	0.99	0.98-1.0	1.16
Killip class >2	1.85	1.41-2.42	<0.001
Resuscitation	1.11	0.92-1.35	0.29
Charlson Index ≥2	0.87	0.72-1.06	0.18

Complications and in-hospital outcome



*MACCE – major adverse cardiac and cerebrovascular event

Independent predictors for in-hospital mortality

	OR	95% CI	P value
Multivessel treatment	1.22	0.85-1.73	0.28
Left main	1.60	0.95-2.63	0.075
Female gender	0.82	0.58-1.18	0.29
Age (per year)	1.06	1.05-1.08	<0.001
Charlson Index ≥2	1.91	1.36-2.68	<0.001
Resuscitation	4.89	3.31-7.21	<0.001
Killip class >2	11.4	8.12-16.0	<0.001

Study limitations

- Potential residual confounding due to lack of data on relevant clinical features could have impacted on both the choice to use M-PCI as well as outcomes.
- Precise anatomical distribution of the lesions and technical features of the procedure itself are unknown.
- No information was available regarding subsequent treatment of non culprit vessels or follow-up data on the patients following discharge.
- The effect of experience could not be assessed.

Conclusions

- STEMI patients with multivessel disease who underwent M-PCI were mostly high-risk patients and sicker than those who underwent S-PCI only.
- Crude in-hospital mortality and MACCE were higher in patients who underwent M-PCI.
- Independent predictors for in-hospital mortality were age, comorbidities, resuscitation prior admission and Killip class >2.
- However, after multivariable adjustment, M-PCI was not independently associated with worse in-hospital mortality.
- Large-scale prospective, randomized trials are needed to guide the appropriateness of M-PCI during the course of STEMI.

There are no conflicts of interest