Impact of Clopidogrel on Clinical Outcomes in Acute Myocardial Infarction with Renal Dysfunction

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OBJECTIVES

- Clopidogrel is an established treatment of acute myocardial infarction (AMI).
- However, renal dysfunction appears to be associated with reduced anti-platelet effects or increased bleeding risk of clopidogrel.
- We examined the impact of clopidogrel on clinical outcomes in patient with AMI according to the renal function.

METHODS

- 13423 patients with AMI were enrolled in the prospective Korea Acute Myocardial Infarction Registry.
- The patients were divided into a group with clopidogrel (n=560) and a group without clopidogrel (n=12863) from November 2005 to September 2008.
- The primary endpoints: major adverse cardiac events (MACE) including a composite of all cause-of-death, myocardial infarction, target lesion revascularization, and coronary artery bypass graft during 1-year clinical follow-up.

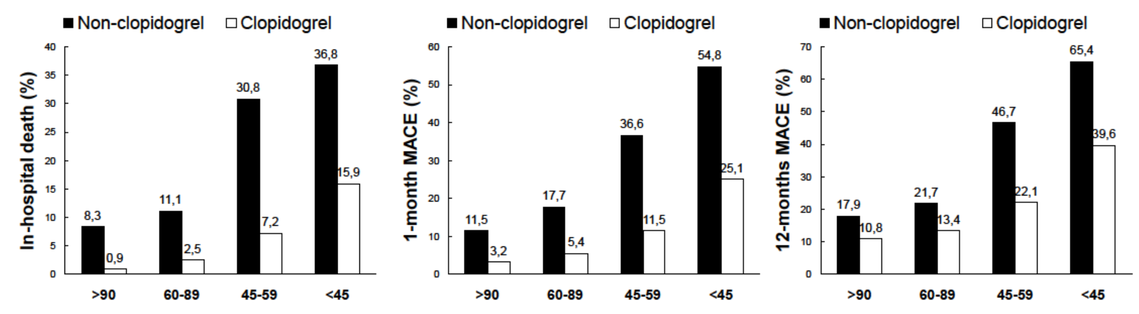

Table 1. Baseline clinical characteristics

	Non-Clopidogrel (n=560)	Clopidogrel (n=12863)	*P* Value
Age (years)	66±13	63±13¶	<0.001
Male	351(61%)	9061(71%)¶	<0.001
Body mass index (kg/m^2)	23.5±3.6	24.0±3.5¶	0.004
Heart rate (beats/minute)	83±24	78±23¶	<0.001
Systolic blood pressure(mm Hg)	123±34	128±29¶	0.001
Diastolic blood pressure(mm Hg)	77±44	78±19	0.456
Killip class > I	203(38%)	3288(27%)¶	<0.001
ST-elevation myocardial infarction	234(43%)	7580(59%)¶	<0.001
History of smoking	247(45%)	7378(58%)¶	<0.001
Hypertension	301(54%)	6201(48%)¶	0.009
Dyslipidemia	51(9%)	1235(10%)	0.818
Diabetes mellitus	166(30%)	3530(28%)	0.225
Kidney function			
Estimated GFR (ml/min/1.73m^2)	63.9±28.1	73.2±24.6¶	<0.001
Category of estimated GFR (ml/min/1.73m^2)			<0.001
>90	109(20%)	3436(27%)	
60-89	216(39%)	5983(47%)	
45-59	91(16%)	1780(14%)	
<45	144(26%)	1664(13%)	

Table 2. In-hospital medication

	Non-Clopidogrel	Clopidogrel	*P* Value
Asprin	406(73%)	12787(99%)	<0.001
Cliostazol	47(8%)	3797(30%)	<0.001
Low-mokecular –weight heparin	124(30%)	4538(36%)	<0.001
Unfractionated heparin	169(22%)	7526(59%)	<0.001
Glycoprotein IIb/IIIa receptor blocker	30(5%)	1577(12%)	<0.001
Beta blockers	250(45%)	9288(72%)	<0.001
Calcium channel blockers	146(26%)	1892(15%)	<0.001
Statins	244(44%)	9457(74%)	<0.001
Angiotensin-converting enzyme inhibitors	230(41%)	9061(70%)	<0.001
Angiotension II receptor blockers	95(17%)	1884(15%)	0.126

RESULTS

- In-hospital death and composite MACE at 1-month and 12-months were significantly increased associated with decreased estimated glomerular filtration rate (eGFR) regardless of taking clopidogrel.
- However, the clopidogrel group was significantly lower in hospital, short-term and long-term mortality throughout the eGFR compare with non-clopidogrel group.
- After adjusting for multiple covariates, the relative risks for 1-year mortality was lower in patients with clopidogrel therapy compared with non-clopidogrel therapy in eGFR of 45-59 and <45 ml/min/1.73m^2 (hazard ratio [HR], 0.40; 95% confidence interval [CI], 0.19–0.82; *P*=0.013; and HR, 0.54; 95% CI, 0.30–0.97; *P*=0.038, respectively).
- But not in eGFR >90 and 60-89 ml/min/1.73m^2 (HR, 1.08; 95% CI, 0.11–10.98; *P*=0.945; and HR, 0.81; 95% CI, 0.32–2.06; *P*=0.657, respectively).

Table 3. Prognostic values of taking of clopidogrel for 12 months mortality (Cox proportional hazards model)

eGFR (ml/min/1.73m2)	Unadjusted	*P* value	Adjusted[b]	*P* value
> 90	0.20 (0.11-0.39)	<0.001	1.08 (0.11-10.98)	0.945
60-89	0.30 (0.20-0.45)	<0.001	0.81 (0.32-2.06)	0.657
45-59	0.26 (0.18-0.37)	<0.001	0.40 (0.19-0.82)	0.013
<45	0.39 (0.30-0.51)	<0.001	0.54 (0.30-0.97)	0.038

CONCLUSIONS

- Clopidogrel therapy in patients with AMI is associated with improved clinical outcomes and decreased the mortality, especially in decreased renal function.