Pretreatment with dual antiplatelet therapy in acute myocardial infarction

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MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

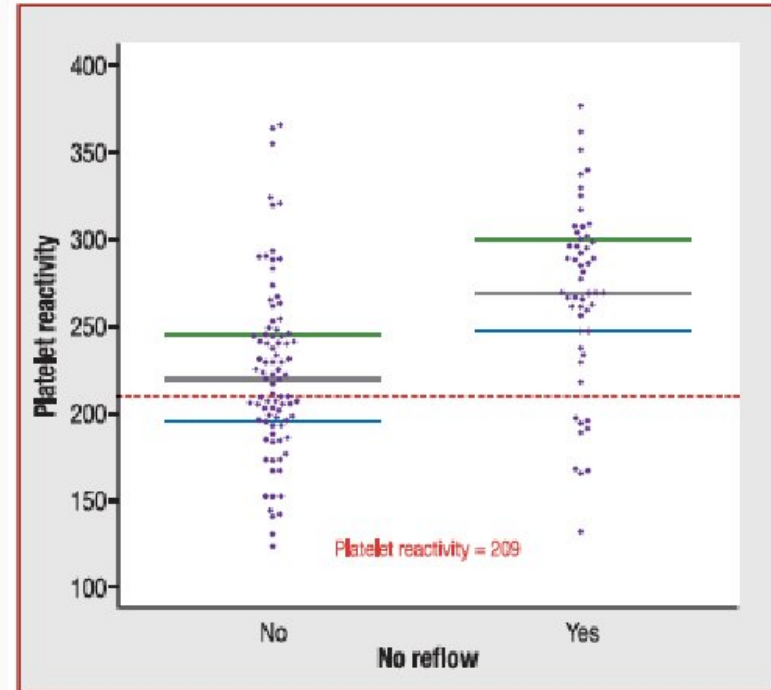ESC Congress 2024
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BACKGROUNDS

- **Combined antithrombotic therapy** prevents **thrombus progression** and its components **embolization**, and thus, it has an essential role in coronary **microcirculation (re)perfusion** in acute myocardial infarction (AMI).
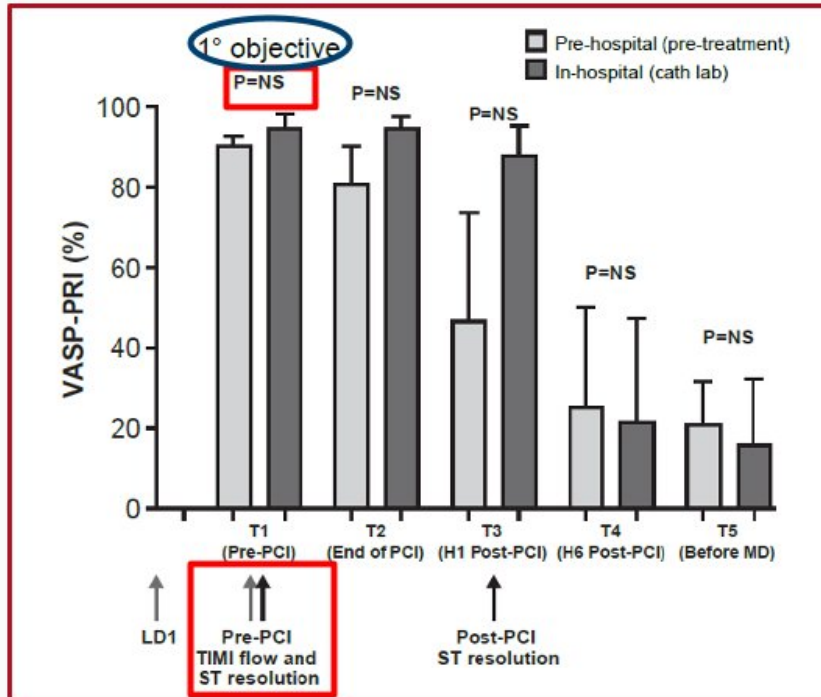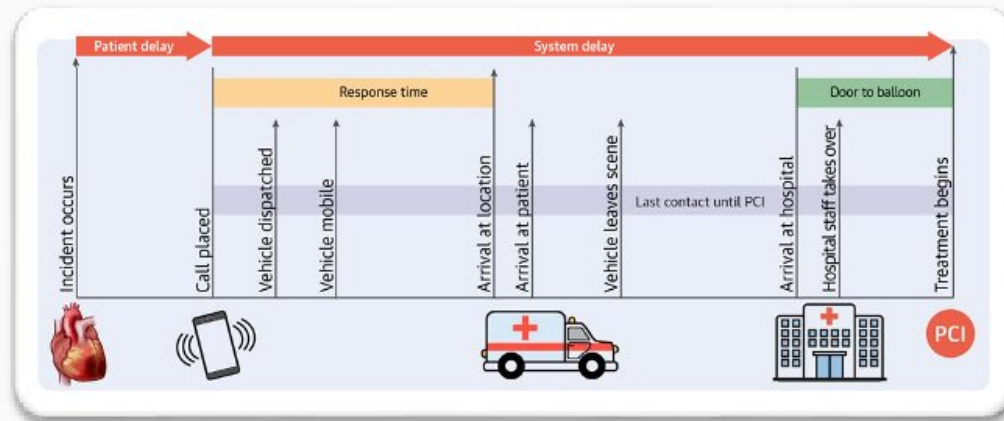

Montalescot G, Van't Hof AW, Lapostolle F, et al. ATLANTIC Investigators. NEJM **2014**

Aitmokhtar O, Paganelli F, Benamara S, et al. Arch Cardiovasc Dis. 2017

Real-Life System Delay in STEMI

Mills EHA et al., JACC Advanced 2024

Countries, *period of evaluation*	n	% Direct Presentation to PCI Center	Median System Delay After First Medical Contact	Delay Between P2Y$_{12}$ Pretreatment and Cathlab Administration
ATLANTIC trial, *2011-2013*[3]	1,862	75.8%	48 minutes	31 minutes
Sweden-SCAAR registry, *2004-2006*[13]	14,380	–	75 minutes	–
USA-NCDR registry, *2008-2012*[14]	41,644	69.1%	84 minutes	–
EURObservational registry, *2015-2018*[15]	11,462	66.8%	95 minutes	–
Spain (CREA-ARIAM registry), *2015-2019*[10]	1,624	88.1%	131 minutes	88 minutes

Silvain J, Montalescot J, Guedeney P, JACC 2024

Aim

- **To investigate the impact of combined antiplatelet therapy *on-treatment on the outcome of patients with STEMI undergoing primary angioplasty.**

  *on-treatment = DAPT lasted ≥ one month at the time of the event

Methods

Patients – **STEMI** undergoing **pPCI** during the **seven years (1/2016-12/2022)** in CZ.

Data from the National Health Information System (NHIS) - covers almost **100% of all cases in the population**.

Multivariate logistic regression adjusted for clinical and procedural characteristics to analyze **the influence of pretreatment** on **the risk** of

- Out-of-hospital cardiac arrest (OHCA),
- Clinical condition at admission –
  need for mechanical ventilation and circulatory instability (Killip≥III),
- Initial TIMI flow through the IRA,
- Short-term mortality.

Results

- 40,383 patients with STEMI undergoing primary PCI (1/2016-12/2022),
- 1,601 patients on Aspirin plus $iP2Y_{12}$ lasting ≥ one month before the event,
- 2,101 patients on chronic OAC - excluded.

		STEMI (Acute + Subacute), N = 38,282			Acute STEMI, N = 30,702			Subacute STEMI, N = 7,580		
		No antiplatelet drug or ASA only	DAPT	P-value	No antiplatelet drug or ASA only	DAPT	P-value	No antiplatelet drug or ASA only	DAPT	P-value
Total		N = 36,681	N = 1,601		N = 29,488	N = 1,214		N = 7,193	N = 387	
Gender	Men	26,310 (71.7 %)	1,175 (73.4 %)	0.147	21,289 (72.2 %)	908 (74.8 %)	0.047	5,021 (69.8 %)	267 (69.0 %)	0.735
Age, mean ± SD		64 ± 13	68 ± 12	< 0.001	63 ± 13	68 ± 12	< 0.001	66 ± 12	69 ± 11	< 0.001
Age 65 years and above		17,949 (48.9 %)	1,036 (64.7 %)	< 0.001	13,920 (47.2 %)	777 (64.0 %)	< 0.001	4,029 (56.0 %)	259 (66.9 %)	< 0.001
Diabetes mellitus		5,873 (16.0 %)	442 (27.6 %)	< 0.001	4,558 (15.5 %)	336 (27.7 %)	< 0.001	1,315 (18.3 %)	106 (27.4 %)	< 0.001
Chronic kidney disease		1,035 (2.8 %)	129 (8.1 %)	< 0.001	719 (2.4 %)	95 (7.8 %)	< 0.001	316 (4.4 %)	34 (8.8 %)	< 0.001
Previous PCI		3,137 (8.6 %)	761 (47.5 %)	< 0.001	2,593 (8.8 %)	621 (51.2 %)	< 0.001	544 (7.6 %)	140 (36.2 %)	< 0.001
Previous CABG		758 (2.1 %)	189 (11.8 %)	< 0.001	580 (2.0 %)	149 (12.3 %)	< 0.001	178 (2.5 %)	40 (10.3 %)	< 0.001
Killip class at admission	1	28,867 (78.7 %)	1,109 (69.3 %)	< 0.001	23,534 (79.8 %)	826 (68.0 %)	< 0.001	5,333 (74.1 %)	283 (73.1 %)	0.657
Left main stenosis > 50 %		1,617 (4.4 %)	127 (7.9 %)	< 0.001	1,317 (4.5 %)	100 (8.2 %)	< 0.001	300 (4.2 %)	27 (7.0 %)	0.008
No. of diseased vessels	1 VD	18,011 (49.1 %)	598 (37.4 %)	< 0.001	14,659 (49.7 %)	452 (37.2 %)	< 0.001	3,352 (46.6 %)	146 (37.7 %)	< 0.001
EF (% of known)	> 50 %	6,378 (40.3 %)	251 (31.8 %)	< 0.001	5,242 (43.6 %)	192 (33.6 %)	< 0.001	1,136 (29.9 %)	59 (27.2 %)	0.396
	30–50 %	7,699 (48.7 %)	398 (50.4 %)	0.333	5,638 (46.9 %)	278 (48.6 %)	0.431	2,061 (54.2 %)	120 (55.3 %)	0.760
	< 30 %	1,739 (11.0 %)	140 (17.7 %)	< 0.001	1,136 (9.5 %)	102 (17.8 %)	< 0.001	603 (15.9 %)	38 (17.5 %)	0.520
7-day mortality		2,018 (5.5 %)	154 (9.6 %)	< 0.001	1,509 (5.1 %)	126 (10.4 %)	< 0.001	509 (7.1 %)	28 (7.2 %)	0.906
30-day mortality		2,937 (8.0 %)	222 (13.9 %)	< 0.001	2,176 (7.4 %)	174 (14.3 %)	< 0.001	761 (10.6 %)	48 (12.4 %)	0.258

Subacute MI - symptoms occurring > 24 hs before admission and treated with PCI.

Effect of DAPT pretreatment (vs. no iP2Y$_{12}$ pretreatment) on the endpoints
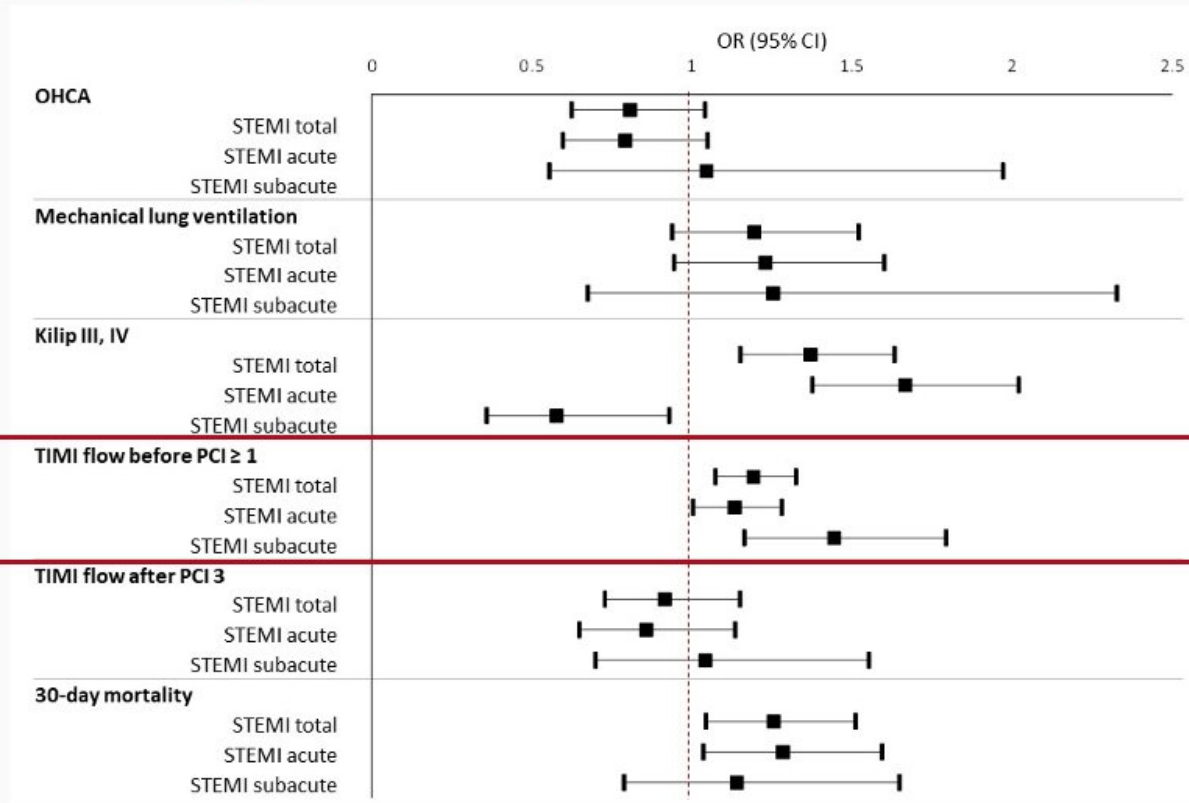
Pretreatment Reference: No pretreatment	30-day mortality Odds Ratio (95% Confidence Interval)
Clopidogrel	1.259 (0.948; 1.671)
Prasugrel/Ticagrelor	0.850 (0.515; 1.402)

OR (95% CI) 1. 193 (1.074; 1.326), p=0.001

Multivariate logistic regression adjustment characteristics - Gender, Age, Diabetes mellitus, Chronic kidney disease, Previous PCI, Previous CABG, Deyo Charlson comorbidity index, MI type, Left main stenosis > 50 %, No. of diseased vessels, Prehospital time delay.

Deyo Charlson comorbidity index includes Myocardial infarction, Heart failure, PAD, Cerebrovascular disease, Dementia, Chronic lung disease, Connective tissue disease, Gastric ulcer disease, liver disease, Diabetes mellitus, Hemiplegia/paraplegia, Kidney disease, Cancer, HIV/AIDS.

Conclusion

- **We confirmed the significant benefit of the DAPT pretreatment in preserving the infarct-related coronary artery flow. This benefit, however, did not translate into a positive effect on the short-term prognosis of STEMI patients, which can be modified by the differences in prognosis-influencing characteristics even after statistical adjustment.**