Thrombus Aspiration and Pre-Hospital Ticagrelor Administration in ST-Elevation Myocardial Infarction: Findings from the ATLANTIC Trial

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Background Adjunctive devices and early pharmacological therapies are potential options to improve myocardial reperfusion and clinical outcomes in patients (Pts) with ST-elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention (PCI).

Purpose To evaluate the potential benefit of thrombus aspiration (TA) and pre-hospital (pre-H) ticagrelor treatment in patients enrolled in the ATLANTIC trial (NCT01347580).

Methods This analysis included 1630 Pts who underwent primary PCI. Multivariate analysis was used to explore the potential association of TA and pre-H treatment to myocardial reperfusion post-PCI and clinical outcomes.

Results A total of 941 (57.7%) Pts underwent TA. Pts treated with TA were younger (60±12 vs 62 ±12 years, p<0.001), more frequently men (83% vs 78.4%, p=0.019), less frequently had a previous myocardial infarction (MI) (6.6 vs 9.6%, p=0.027) or transient ischemic attack (0.4% vs 1.5%, p= 0.026), more frequently had radial access (70.4% vs 64.7%, p=0.015), less frequently had stent implantation (93.2% vs 95.6%, p=0.003) and more often received glycoprotein IIb/IIIa inhibitors (GPIs) before PCI (37.2 vs 25.4%, p<0.001) compared with patients treated without TA.

		Adjusted Multivariate Logistic Model§ N=1622	
Endpoints	**Predictors**	**Odds-ratio (95% CI)**	**P-value**
30 days Composite of death/new MI/urgent revascularization/definite stent thrombosis and bail-out glycoprotein IIb/IIIa inhibitor use	Pre Hospital vs In Hospital ticagrelor	0.88 (0.65;1.19)	0.4007
	TA vs NO TA	**1.67 (1.23;2.27)**	**0.0010**
	Interaction†		0.4743
Bail-out use of glycoprotein IIb/IIIa inhibitors	Pre Hospital vs In Hospital ticagrelor	0.79 (0.56;1.13)	0.1952
	TA vs NO TA	**2.12 (1.49;3.01)**	**<.0001**
	Interaction†		0.7783
30 days Composite of death/new MI/urgent revascularization and definite stent thrombosis	Pre Hospital vs In Hospital ticagrelor	1.11 (0.67;1.83)	0.6823
	TA vs NO TA	0.99 (0.59;1.64)	0.9610
	Interaction†		0.8203
30 days New MI or definite acute stent thrombosis	**Pre Hospital vs In Hospital ticagrelor**	**0.43 (0.20;0.92)**	**0.0307**
	TA vs NO TA	1.16 (0.53;2.51)	0.7158
	Interaction†		0.6308
30 days New MI	Pre Hospital vs In Hospital ticagrelor	0.70 (0.31;1.58)	0.3885
	TA vs NO TA	0.92 (0.40;2.12)	0.8537
	Interaction†		0.9056
30 days Definite stent thrombosis	**Pre Hospital vs In Hospital ticagrelor**	**0.26 (0.07;0.91)**	**0.0357**
	TA vs NO TA	2.38 (0.67;8.43)	0.1788
	Interaction†		0.5818
30 days Urgent revascularization	Pre Hospital vs In Hospital ticagrelor	0.82 (0.31;2.16)	0.6899
	TA vs NO TA	1.01 (0.38;2.69)	0.9878
	Interaction†		0.3373
30 days Stroke (ischemic)	Pre Hospital vs In Hospital ticagrelor	3.96 (0.95;16.4)	0.0582
	TA vs NO TA	1.31 (0.30;5.6)	0.7160
	Interaction†		0.4841

§ The multivariate adjusted analysis is the multivariate analysis with variables forced in the model*: age (<75, >=75), sex, BMI (<30 kg/m², >=30 kg/m²), Prior MI, Prior PCI, Transient Ischaemic Attack, Non-haemorrhagic Stroke, Stent, DE Stent, BM stent, Hypertension, Arterial access and GP IIb/IIIa inhibitor before PCI.
† Interaction between treatment group and Thrombus Aspiration

In an adjusted multivariate logistic model (tables), TA was significantly associated with higher 30-day composite of death/new MI/urgent revascularization/definite stent thrombosis and bail-out GPIs use (OR 1.67, 95% CI 1.23-2.27, p=0.001), higher bail-out use of GPI (OR 2.12, 95% CI 1.49-3.01; p<0.001), higher 30-day Thrombolysis in Myocardial Infarction (TIMI), major bleeding (OR 3.06, 95% CI 1.17-7.96; p=0.022) and had a borderline association with absence of post-PCI TIMI 3 flow in the culprit vessel (OR 1.28, 95% CI 0.97-1.68, p=0.078).

Pre-H treatment was significantly associated with lower composite of 30-day new MI and definite stent thrombosis (ST) (OR 0.43, 95% CI 0.20-0.92, p=0.031), or lower definite ST (OR 0.26, 95% CI 0.07-0.91, p=0.036). Pre-H treatment showed a borderline association with absence of ST-segment resolution ≥ 70% post PCI (OR 0.82, 95% CI 0.66-1.02, p=0.069). No significant interactions between TA and pre-H ticagrelor were present for the explored endpoints.

		Adjusted Multivariate Logistic Model I§, N=1536	
Endpoints	**Predictors**	**Odds-ratio (95% CI)**	**P-value**
Absence of TIMI flow grade 3 of MI culprit vessel post-PCI	Pre-H vs In-H ticagrelor	0.89 (0.68;1.16)	0.3812
	TA vs NO TA	1.28 (0.97;1.68)	0.0781
	Interaction†		0.6732
Absence of ST-segment elevation resolution >= 70% POST PCI	Pre-H vs In-H ticagrelor	0.82 (0.66;1.02)	0.0693
	TA vs NO TA	0.88 (0.71;1.09)	0.2462
	Interaction†		0.7177

Conclusions In Pts enrolled in the ATLANTIC trial**,** TA was left to physicians' discretion and was not associated with improvement in myocardial reperfusion or 30-day clinical outcomes. Pre-H ticagrelor treatment predicted both lower 30-day ST and new MI without significant interaction with TA.

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