

# Antiplatelet Resistance in People Undergoing Neuroendovascular Procedures

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## Introduction

- Neuroendovascular surgical procedures are the gold-standard treatment for intracranial aneurysms
- Dual antiplatelet therapies (DAPT), which include aspirin with a P2Y12-inhibitor (clopidogrel, prasugrel and ticagrelor), are used to reduce the risk of post-procedural thromboembolism
- However, emerging evidence reports approximately half of all patients prescribed clopidogrel may be non-responsive to clopidogrel
- VerifyNow platelet function assays are point of care assays that can assess antiplatelet response
- Understanding patient characteristics that affect antiplatelet response could assist in individualised prescribing choice of P2Y12 inhibitor

## Aims

To determine the incidence of DAPT non-responsiveness via VerifyNow platelet function assays and identify patient characteristics associated with antiplatelet non-responsiveness.

## Methods

- Retrospective observational audit of digital medical records from a large quaternary metropolitan hospital in Queensland
- Patients undergoing elective or emergency neurointervention coil and/or stent procedures were included
- Platelet function, confirmed via VerifyNow, was compared to patients demographics concurrent use of medications and the type of antiplatelet(s) prescribed
- Antiplatelet non-responsiveness was defined as platelet inhibition of <40%.

## Results

- A total of 69 patients were included with a mean age of 59 ± 9.4 years
- Prasugrel was the most used P<sub>2</sub>Y<sub>12</sub>-inhibitor (63.8%, n=44) followed by clopidogrel (33.3%, n=23) and ticagrelor (2.9%, n=2)
- 9/23 (43%) patients taking clopidogrel and 8/44 (18%) patients taking prasugrel had a platelet inhibition < 40% and were therefore deemed non-responsive
- The use of proton pump inhibitors (PPIs) with clopidogrel increased antiplatelet non-responsiveness compared to clopidogrel with no PPI (62.5%, n = 5/8 vs 33%, n = 5/15), but not with prasugrel (20%, n = 2/10 vs 17%, n = 6/35)
- Smoking status, body mass index (BMI) or gender did not affect responsiveness to clopidogrel.

### Demographics of antiplatelet non-responders

Cohort Audited (n=69)	Number (%)	<40% platelet Inhibition (%)	>40% platelet Inhibition (%)
Total	69 (100)	17 (25)	52 (75)
Age (Median)	57 ± 9.4	61 ± 10.0	58 ± 9.2
Sex, Male	19 (27.5)	4 (19)	15 (71)
Sex, Female	50 (72.5)	9 (13)	41 (59)
Current Smoker	26 (38)	7 (10)	19 (28)
Previous Smoker	26 (38)	3 (4)	23 (33)
Non-Smoker	17 (24)	14 (20)	3 (4)
BMI > 25kg/m <sup>2</sup>	48 (70)	8 (12)	40 (58)
Hypertension	45 (65)	9 (13)	36 (52)

### Percentage Platelet inhibition by concomitant medication

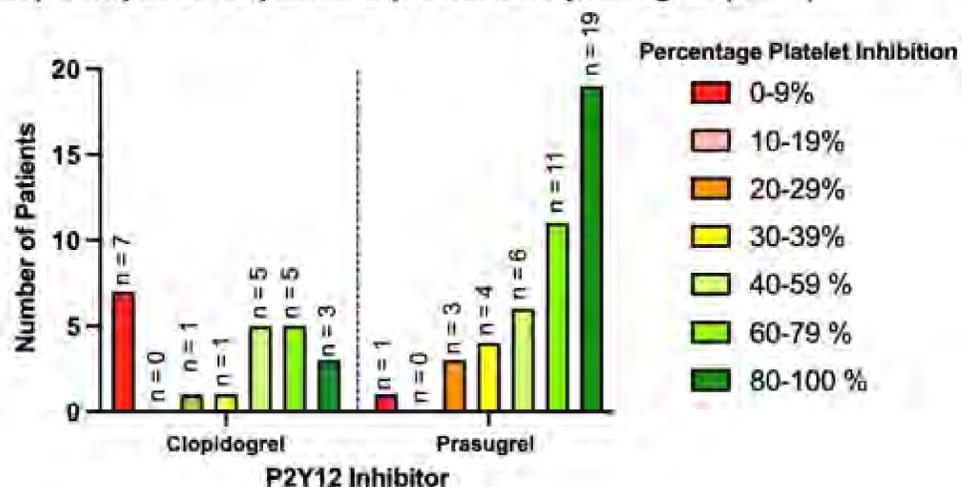
Drug Class	Clopidogrel Cohort (n=23)		
	<40% Platelet Inhibition (n=9)	>40% Platelet Inhibition (n=14)	Total
ACE-I	1 (20%)	4 (80%)	5
ARB	4 (44%)	5 (56%)	9
β-Blocker	2 (40%)	3 (60%)	5
DHP CCB*	5 (100%)	0 (0%)	5
Non-DHP CCB	0 (0%)	2 (100%)	2
PPI	4 (50%)	4 (50%)	8
Statin	4 (33%)	8 (66%)	12

Drug Class	Any P2Y12 Inhibitor Cohort (n=69)		
	<40% Platelet Inhibition (n=17)	>40% Platelet Inhibition (n=52)	Total
ACE-I	2 (13%)	13 (87%)	15
ARB*	9 (43%)	12 (57%)	21
B-Blocker	2 (14%)	12 (86%)	14
DHP CCB	6 (33%)	12 (67%)	18
Non-DHP CCB	0 (0%)	3 (100%)	3
PPI	6 (32%)	13 (68%)	19
Statin	7 (28%)	18 (72%)	25

\* p < 0.05

Percentage platelet inhibition for patients prescribed clopidogrel (n=23) compared to patients prescribed prasugrel (n=44)



## Conclusion

- Clopidogrel use was associated with a greater antiplatelet non-responsiveness than prasugrel or ticagrelor.
- Concomitant use of a proton pump inhibitor is associated with increased rates of antiplatelet non-responsiveness.