

# Coated-Platelets Enhance TIA/Stroke Risk Prediction in Asymptomatic Carotid Stenosis Patients Followed with Carotid Doppler Surveillance



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## Introduction

- Coated-platelets are a subset of procoagulant platelets observed upon dual agonist stimulation with collagen and thrombin.
- Coated-platelet levels at baseline have been shown to predict incident TIA/stroke.
- Identifying asymptomatic carotid stenosis patients at high risk for TIA/Stroke has significant treatment implications.
- We assessed whether coated-platelets improve upon carotid doppler surveillance for predicting TIA/stroke in asymptomatic carotid stenosis.

## Methods

- Patients with  $\geq 50\%$  stenosis were enrolled and carotid Doppler performed every 6-12 months.
- Vascular risk factors were aggressively managed and those with  $\geq 80\%$  stenosis referred for revascularization according to current guidelines.
- Coated-platelet levels were measured at baseline.
- Demographics, comorbidities, and medications were recorded, and incident TIA/strokes determined by blinded adjudication.
- Freedom from TIA/stroke was determined by Kaplan-Meier survival analysis and Cox proportional hazards analysis.

## Results

Baseline demographics and characteristics (111 patients were enrolled)

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Age – years: 71.3<math>\pm</math>7.0</li> <li>• Male gender: 108 (97.3%)</li> <li>• White race: 103 (92.8%)</li> <li>• Current smoker: 42 (37.8%)</li> <li>• Hypertension: 87 (78.4%)</li> <li>• Diabetes Mellitus: 65 (58.6%)</li> <li>• Hypercholesterolemia: 91 (82%)</li> <li>• Carotid Artery Stenosis:</li> </ul> | <ul style="list-style-type: none"> <li>• Antiplatelet medication use: 106 (95.5%)</li> <li>• Statin medication use: 104 (93.7%)</li> <li>• Baseline coated platelets %: 35.9<math>\pm</math>12.2%</li> <li>• LDL (mg/dL): 85.4<math>\pm</math>32.4</li> <li>• HDL (mg/dL): 40.5<math>\pm</math>12.8</li> <li>• Total Cholesterol (mg/dL): 153.8<math>\pm</math>41.1</li> <li>• Triglycerides (mg/dL): 162.5<math>\pm</math>99.9</li> <li>• Hemoglobin A1c: 6.6<math>\pm</math>1.4</li> <li>• Creatinine (mg/dL): 1.2<math>\pm</math>0.50</li> <li>• Systolic blood pressure (mmHg): 134.5<math>\pm</math>22.9</li> <li>• Diastolic blood pressure (mmHg): 72.1<math>\pm</math>13.2</li> </ul> |
|--|---|
- Unilateral 50-69% - 43 (38.7%)  
 Unilateral 70-79% - 21 (18.9%)  
 Unilateral 80-99% - 9 (8.1%)  
 Bilateral 50-69% - 21 (18.9%)  
 Bilateral 70-79% - 10 (9.0%)  
 Bilateral 80-99% - 7 (6.3%)

Figure 1. Kaplan Meier Survival Analysis: Freedom from ipsilateral carotid related TIA/stroke in high vs low coated-platelets groups

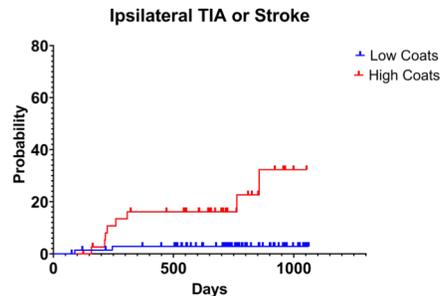


Figure 2. Kaplan Meier Survival Analysis: Freedom from ipsilateral carotid related TIA/stroke in high vs low coated-platelets groups

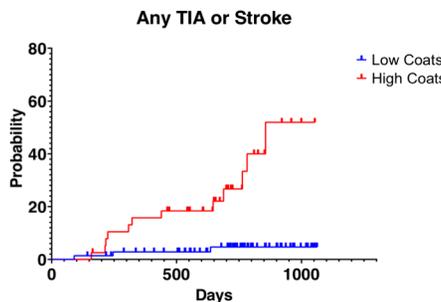
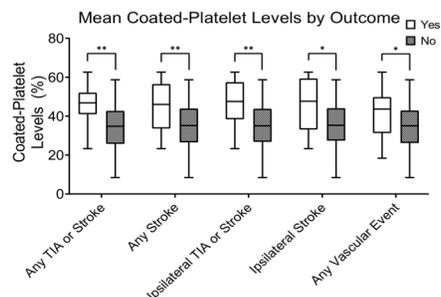


Figure 3. Box and whiskers plot comparing coated-platelet levels in patients with and without various incident neurovascular events



## Results (cont'd)

- 8 strokes and 2 TIAs occurred ipsilateral to carotid stenosis:
  - 4 without progression or progression to  $< 80\%$  stenosis
  - 2 with progression identified post stroke
  - 4 with  $> 80\%$  stenosis while awaiting revascularization
- Coated-platelet levels  $\geq 41\%$  at baseline were associated with a HR of 8.65 (95% CI 1.83, 40.94,  $p=0.0065$ ) for ipsilateral TIA/stroke.
- Sensitivity and specificity is 80.0% (95% CI 44.4, 97.5) and 70.0%, respectively (95% CI 59.3, 78.1).

## Discussion

- Baseline coated-platelet levels predicted TIA/stroke in this cohort with  $\geq 50\%$  asymptomatic carotid stenosis despite a management approach using carotid doppler surveillance and revascularization for  $\geq 80\%$  stenosis.
- A surveillance and revascularization approach failed to sufficiently reduce TIA/stroke rates
- This is because TIA/strokes occurred either among those with  $< 80\%$  stenosis, before progression to  $\geq 80\%$  could be identified, or before revascularization could be completed for those with  $> 80\%$  stenosis.
- Coated-platelet levels may identify patients at high risk for stroke despite control of vascular risk factors who may benefit from earlier revascularization.

## References

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