

# 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)

- |                                  |  |
|----------------------------------|--|
| • Age – years: 71.3 $\pm$ 7.0    | • Antiplatelet medication use: 106 (95.5%)         |
| • Male gender: 108 (97.3%)       | • Statin medication use: 104 (93.7%)               |
| • White race: 103 (92.8%)        | • Baseline coated platelets %: 35.9 $\pm$ 12.2%    |
| • Current smoker: 42 (37.8%)     | • LDL (mg/dL): 85.4 $\pm$ 32.4                     |
| • Hypertension: 87 (78.4%)       | • HDL (mg/dL): 40.5 $\pm$ 12.8                     |
| • Diabetes Mellitus: 65 (58.6%)  | • Total Cholesterol (mg/dL): 153.8 $\pm$ 41.1      |
| • Hypercholesterolemia: 91 (82%) | • Triglycerides (mg/dL): 162.5 $\pm$ 99.9          |
| • Carotid Artery Stenosis:       | • Hemoglobin A1c: 6.6 $\pm$ 1.4                    |
| Unilateral 50-69% - 43 (38.7%)   | • Creatinine (mg/dL): 1.2 $\pm$ 0.50               |
| Unilateral 70-79% - 21 (18.9%)   | • Systolic blood pressure (mmHg): 134.5 $\pm$ 22.9 |
| Unilateral 80-99% - 9 (8.1%)     | • Diastolic blood pressure (mmHg): 72.1 $\pm$ 13.2 |
| 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

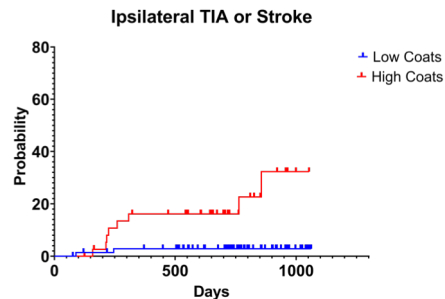


Figure 2. Kaplan Meier Survival Analysis: Freedom from ipsilateral carotid related TIA/stroke in high vs low coated-platelets groups

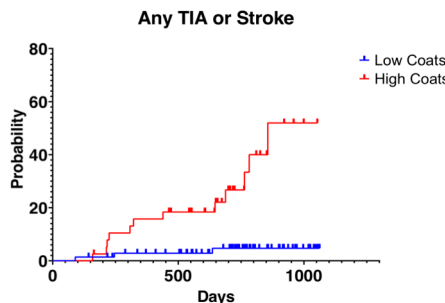
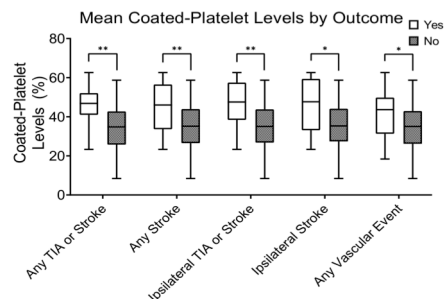


Figure 3. Box and whiskers plot comparing coated-platelet levels in patients with and without various incident neurovascular events



## 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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