SUPPRESSION OF PLATELET AGGREGATION CAUSED BY GLUCOSAMINE SUPPLEMENT

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INTRODUCTION

- A healthy 47-year-old Hispanic female has donated blood for several years to provide normal platelet aggregometry controls in our facility in aspirin response studies.
- Aggregation results were consistently predictable. The donor was not knowingly taking any NSAIDS or other medications or supplements that would affect platelet function.
- On two subsequent donations one month apart the platelet aggregation results were abnormal.

INTRODUCTION

- What was the problem?
- She reported she had begun taking a daily dose of 1500 mg of glucosamine with 1500 mg celadrin supplement approximately 4 weeks prior to first testing.
- A literature search generated one article using humans that demonstrated that glucosamine suppressed platelet ADP receptors, but not collagen or thrombin receptors.
- Two other articles using guinea pigs and dogs also showed the effect of glucosamine on platelet function.

MECHANISM OF ACTION OF ASA:

Inhibits the prostaglandin-producing enzyme cyclooxygenase which converts arachidonic acid into prostaglandins.

MATERIALS AND METHODS

- Platelet aggregations were performed on a Chrono-Log 570 VS using both optical and impedance aggregometry using ADP, Collagen and Arachidonic Acid as agonists.
- Studies were performed on the PFA-100 using the ADP/Collagen and EPI/Collagen cartridges.
- The Accumetrics system was used to detect a response for the presence of aspirin and Plavix using individual cartridges.
- A CBC with platelets was performed on an ADVIA 120 hematology analyzer.
- All platelet function testing was performed on 3.2% Citrated whole blood.

RESULTS

<table>
<thead>
<tr>
<th>Dates</th>
<th>Optical (%)</th>
<th>Impedance ADP 20.0 μM</th>
<th>Impedance ADP 10.0 μM</th>
<th>Impedance ADP 5.0 μM</th>
<th>Impedance Collagen 1.0 μg</th>
<th>Impedance Aspirin 1.0/3.0 μM</th>
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RESULTS

<table>
<thead>
<tr>
<th>Dates</th>
<th>PFA - ADP/COLL (sec)</th>
<th>PFA - EPI/COLL (sec)</th>
<th>Accumetrics ASA (ARU)</th>
<th>Accumetrics P2Y12 (%)</th>
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</thead>
<tbody>
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<td>610</td>
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</table>

Normal QC subject: Baseline Normal aggregations before enrolling in 81 mg ASA protocol.

Normal QC subject: Baseline aggregations before enrolling in 325 mg ASA protocol

Subject has been taking a glucosamine/celadrin supplement for 30 days. Platelet aggregations are abnormally low.

Subject has now been taking glucosamine/celadrin supplement for two months. All aggregations are decreased.

Subject has not ingested the glucosamine/celadrin supplement for 14 days. Aggregations have normalized.
DISCUSSION

• The subject discontinued the supplement and the platelet aggregations returned to normal limits.
• Only the ADP optical and whole blood platelet aggregations curves were affected by the supplement.
• The PFA-100 closure times were all within normal limits.
• The Accumetrics P2Y12 cartridges which are specific for that ADP receptor were all within normal limits.

REFERENCES