Thromboembolic Stroke: A Sequela of Hymenoptera Venom-induced Anaphylaxis

John Frith DO
Allergy/Immunology Fellow PGY4
University Hospital Richmond Medical Center
Outline

• Introduction
• Case Report
• Results
• Discussion
• Conclusion
Introduction

• Hymenoptera sting can lead to a systemic allergic reaction in 3% of adults
• 40 fatal stings occur each year in the US
• Most Common Symptoms:
  • Cutaneous signs (e.g., urticaria, angioedema, flushing, pruritus)
  • Respiratory signs (e.g., dyspnea, throat tightness, stridor, wheeze)
• Circulatory component (e.g., dizziness, hypotension, shock)
• Thromboembolic stroke associated with hymenoptera venom-induced anaphylaxis has not been documented in the literature
Case Report: HPI

• 44 year old Male
• Hx of hypertension
• Stung by hymenoptera in his right knee
• Within 20 minutes developed
  • Lightheadedness, dizziness, diaphoresis, hives
• Within 1 hour
  • Ataxic gait, dysarthria, left sided hemiparesis, and facial droop
• Co-workers called EMS
• No history of anaphylaxis or being stung that he could recall
ED Course

- 75 minutes after sting was treated in ED with:
  - Diphenhydramine, Famotidine, and Methylprednisolone
- Vital signs were stable in the ED and was not given epinephrine
- CT head was negative
- MRI showed an acute infarction with thrombus in the right middle cerebral artery
ED Course

• Initial Labs:
  • INR-1
  • PT-10.3
  • Platelet count 259
  • Additional labs for venous thromboembolism or DIC, CRP were not obtained

• Neurology evaluated the patient and was given tPA
Hospital Course

- Thromboembolic work up did not reveal any source of emboli
  - Neck MRA
  - Echocardiogram
  - Cardiac Event monitor (out patient was negative)
- Repeat MRI showed resolution of emboli
- Day 3 of admission function of his left side significantly improved
- Discharged on Atorvastatin, Aspirin, injectable Epinephrine
Clinic Testing - 3 weeks later

<table>
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<tr>
<th>Allergen</th>
<th>(ug/ml)</th>
<th>Wheal Size on Scale 0 to 4</th>
<th>Allergen</th>
<th>IgE Level (Normal &lt;0.35 KL)</th>
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<td>Yellow Jacket</td>
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<td>White hornet</td>
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<td>Honey bee</td>
<td>1</td>
<td>1</td>
<td>Honey bee</td>
<td>&lt;0.35</td>
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Clinical Course

• Given the specific stinging insect was not identified by the patient a conservative approach was taken to desensitize him to all skin test positive results.

• Venom immunotherapy (VIT) was initiated
Discussion

• Activation of the coagulation cascade during anaphylaxis is known, however its precise mechanism remains elusive

• Smith et al. obtained blood samples of two participants with severe anaphylaxis after insect challenge
  • Assessed for ability to correct the ptt of plasma selectively deficient in a coagulation factor
  • Factor V and VIII markedly decreased at 2% and 14%
  • Fibrinogen was reduced to 1/9th of the level obtained at baseline
  • The consumption of these coagulation factors is consistent with a concomitant thrombotic process

• There have been few cases describing stroke after anaphylaxis but there were shown due to documented hypotensive episodes and imaging showed no emboli
Conclusion

• Three percent of the population is at risk for anaphylaxis induced by hymenoptera sting.
• Hymenoptera anaphylaxis has been associated with thrombotic processes.
• A spectrum of diseases share the common pathogenesis of thrombosis, including stroke and myocardial infarction both of which carry high morbidity and mortality.
• In light of the under recognition of fatalities caused by hymenoptera sting there is likely an under appreciation for the non-fatal thrombotic processes provoked by them as well.
• Venom immunotherapy 95%-100% effective in preventing systemic reactions
• This is the first definitive case demonstrating thromboembolic stroke in the setting of hymenoptera induced-anaphylaxis.
References


Thank you