An Atypical Response to Epinephrine

Niren Naidoo  
*Henry Ford Health System*

Adithya Peruri  
*Henry Ford Health System*

Alan Mundakkal  
*Henry Ford Health System*

Jayanthi Chandrasekaran  
*Henry Ford Health System*

Follow this and additional works at: [https://scholarlycommons.henryford.com/merf2019caserpt](https://scholarlycommons.henryford.com/merf2019caserpt)

Recommended Citation

Naidoo, Niren; Peruri, Adithya; Mundakkal, Alan; and Chandrasekaran, Jayanthi, "An Atypical Response to Epinephrine" (2019). *Case Reports*, 98.  

This Poster is brought to you for free and open access by the Medical Education Research Forum 2019 at Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Case Reports by an authorized administrator of Henry Ford Health System Scholarly Commons. For more information, please contact acabrer4@hfhs.org.
Case Description: A 38-year-old Caucasian female presented after a bee sting and subsequent Epipen self-administration. She had no past medical history except for anaphylactic reaction to a bee sting in her childhood, and had undergone desensitization with an allergist. En route to the hospital, she developed chest pressure, palpitations, facial droop, dysarthria, and decreased strength. The patient’s vital signs were within normal range. Blood work was notable for hypokalemia, hyperglycemia and lactic acidosis. CT head with angiography was unremarkable. Neurology was consulted and her MRI brain showed no evidence of acute stroke. Within three hours of hospital admission her symptoms had resolved. The patient was monitored overnight, and subsequently discharged the next day with no residual deficits.

Discussion: The Epipen is widely used for immediate relief of impending anaphylaxis. We believe this patient’s angina and TIA-like symptoms were secondary to non-specific vasospasm given the alpha-adrenergic mechanism of epinephrine. A literature review showed limited information on such reactions after Epipen injection.

Conclusion: It is imperative that physicians are aware of such potential adverse effects in order to enhance patient care.

### Tables and Figures

#### Tables

**Table 1:**

<table>
<thead>
<tr>
<th>Compound</th>
<th>Value (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>136</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.7</td>
</tr>
<tr>
<td>Chloride</td>
<td>104</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.2</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.9</td>
</tr>
<tr>
<td>Glucose</td>
<td>103</td>
</tr>
<tr>
<td>Lipid</td>
<td>187</td>
</tr>
<tr>
<td>Total protein</td>
<td>8.8</td>
</tr>
</tbody>
</table>

#### Figures

- An Atypical Response to Epinephrine
- Conclusion

### Discussion

This case presents a very rare and previously undocumented reaction from the use of an Epipen. Transient global paralysis has never been previously reported as an adverse reaction. The patient was exposed to a bee sting venom at a young age and was hospitalized due to anaphylactic shock. After this incident she underwent several years of desensitization with an allergist. It is uncertain whether desensitization therapy is able to be maintained without further exposure in the following 28 years of life, or even if the patients immune system developed a new and heightened response to bee venom related antigens. Bee venom is made up of several toxins and compounds that cause a proinflammatory response. Studies have shown that it can cause a systemic (including possible anaphylaxis) or localized response [2].

The patient’s presentation is thought to be the first case of global (cerebral and coronary) vasospasm secondary to epinephrine administration. Epinephrine is known to be dose-dependent whereby at lower concentrations, beta-related effects are greater, and at higher concentrations alpha-effects play a greater role. There have been multiple accounts of digital ischemia due to accidental Epipen injection. This is secondary to localisation of high concentration of epinephrine, resulting in vascular constriction from α-1 adrenergic stimulation.

It is uncertain whether certain vasculature beds may be more sensitive to adrenergic receptor stimulation than others. This case presentation suggests is that there was evidence of hypoperfusion to certain areas following epinephrine administration, as far as 12 hours following administration. Relating this to the clinical scenario, it leads us to believe that some individuals are more sensitive to epinephrine stimulation than others. Furthermore, genetics and environmental factors may play a role in sensitivity toward epinephrine and vasospasm.

Based on the history, physical exam and diagnostic studies, the primary care team built a plan of treatment to rule out a concerning diagnosis such as a stroke. After analysis of the results, neurology and the primary team were confident that the patient could be discharged home safely. The patient was recommended to follow-up with her primary care physician within a week of discharge. The history of anaphylaxis in response to bee venom is still concerning. The patient was recommended to continue using her Epipen in any future incidents as the benefits of the epinephrine outweigh the risks of possible drug induced vasospasm or temporary neurologic deficits.

### Conclusion

Despite potentially rare and unusual side effects, patients should be encouraged to continue to use epinephrine in potentially life threatening allergic or anaphylactic reaction settings. Further research should be undertaken to determine whether certain environmental and genetic factors may precipitate epinephrine related side effects. This may additionally include further evaluation of α-1 receptor stimulation testing to determine whether certain environmental triggers play a role in receptor sensitivity. Given the necessity of maintaining a patient airway and circulation, rare side effects from epinephrine should not discourage providers from both educating and prescribing potentially life-saving therapy to patients. Patients should additionally be instructed on how to monitor for concerning signs when being prescribed the medication so as to minimize poor outcomes.

### References