Treatment with F(ab')2 (Anavip®) for Eastern Massasauga Rattlesnake Envenomation: A Case Report

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BACKGROUND

- FabAV (CroFab) and F(ab')2 (Anavip®) are the two FDA-approved antivenins for crotalid (pit viper) envenomation.
- The Eastern Massasauga rattlesnake is native to the Great Lakes region in North America.
- All documented cases of antivenin administration for Eastern Massasauga bites have used FabAV, which is derived from North American crotalid species.
- It is not previously known if F(ab')2, derived from South American crotalid species, is safe and/or effective in Eastern Massasauga envenomations.

PATIENT DESCRIPTION

- A 33-year-old wilderness photographer in Michigan was bitten in the right knee by an Eastern Massasauga rattlesnake.
- In route to the emergency department (ED) he reported nausea and cold sweats, but upon arrival his only complaint was localized pain at the envenomation site.
- Initial vitals: heart rate 110, blood pressure of 147/105. Otherwise, normal
- First labs: WBC of 13.4 (x10^3/uL), PT 11.3 seconds, and INR 1.1.
- Transfer to tertiary center delayed administration of antivenin to 7.5 hours post-envenomation. F(ab')2 was selected for use.
- Repeat labs showed a WBC 22.1, PT 19.5, and INR 1.9. Fibrinogen was 232 (mg/dL).
- Over the 2-day hospital course, a total of 34 vials of F(ab')2 were administered.
- After the first 10 vials, PT/INR had further increased.
- After the second 10 vials, PT/INR were decreasing but fibrinogen reached critically low levels.
- After the third 10 vials, values were normalizing but hypofibrinogenemia persisted.
- A final 4 vials were administered, after which labs normalized and remained stable, and the patient's symptoms were controlled with oral acetaminophen alone.
- No adverse reactions occurred throughout the hospital course.

DISCUSSION

- While FabAV and F(ab')2 have similar indications and efficacy in published trials, it has been suggested that regional differences should be considered when choosing an antivenin. It's possible F(ab')2 (derived from South American species) is less effective than FabAV (from North American species) when treating Eastern Massasauga bites.
- Previous research has shown a mean of 21 vials F(ab')2 when treating crotalid envenomation, lower than the 34 vials given in our case.
- Average time-to-treatment in previous research has been 3 hours, compared with 7.5 hours in this patient. Delayed time to treatment may have impacted antivenom efficacy.
- Average hospital length of stay in crotalid envenomation treated with F(ab')2 is 1.6 days, comparable with the 2 days in our case.
- Delayed coagulopathies can occur in crotalid envenomation; however no follow-up labs were obtained in our patient.

Figure 1. Eastern Massasauga Rattlesnake

Figure 2. Rattlesnake bite on knee

CONCLUSIONS

- This case suggests a favorable safety profile, but possibly decreased efficacy, of F(ab')2 for envenomation by Eastern Massasauga rattlesnakes.
- Our patient had delayed time to treatment, above average number of F(ab')2 vials administered, and a relatively benign clinical course. He was discharged in under 2 days without adverse effects to treatment.