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Introduction

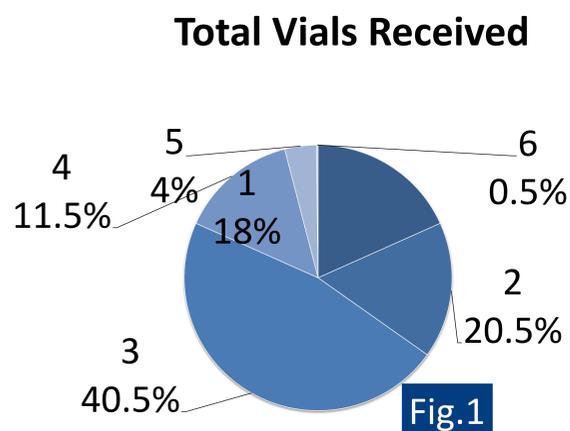
- The effectiveness of *Centruroides* F(ab')₂ antivenom (AV) in controlling the neurotoxicity and clinical complications of severe scorpion envenomation is well established.¹
- Concerns stemming from its high-cost and reports of unexpected and astronomical medical bills received by patients treated with AV have emerged.²
- Despite the 2011 FDA approved protocol of a 3 vial infusion over 15 minutes, healthcare providers often choose alternative dosing regimens, citing the treatment's expense and limited availability.
- This retrospective review seeks to quantitate billed charges associated with AV use to better understand its impact on patient and healthcare economics.

Methods

- IRB approved retrospective review of 527 patients presenting to a hospital system with severe scorpion envenomation from April 2013 to May 2015.
- Subjects included were those with clinical signs of scorpion envenomation who received AV. Exclusion criteria included patients not receiving AV or if clinical records were unavailable.
- Clinical data extracted included signs and symptoms, initial dose of AV, total number of vials of AV received, additional treatments received, and LOS.
- Institutional financial records were obtained and included billed charges and hospital cost for each study subject.
- Continuous data were reported as median with interquartile range and linear regression was utilized to determine predictors of outcomes.

Results

- All patients had a grade 3 or 4 envenomation.
- The majority were treated in an ED setting (95.5%).
- See **Fig. 1** for breakdown of total vials of AV received.
- Most patients received 3 vials initially (52.6%) followed by 1 vial of AV (43.6%) compared to 2 (3.8%) **Fig.2**.
- Linear regression showed that billed charges were predicted by total number of vials administered and LOS (adjusted R² of 0.81).
- Each additional vial increased billed charges by \$8,091.98.
- Each additional hour increased charges by \$327.51.
- Correlation between billed charges and hospital costs was poor.



Initial Dose Administered	Median (IQR) Total Charges
3 Vials 52.6%	\$29,308
2 Vials 3.8 %	(\$20,477 - \$34,866)
1 Vial 43.6%	
Estimated Charge Increases	Cumulative dose
Per/hr: \$370.46	≥3vials 56.5%
Per/vial: \$7,765.51	1-2 vials 43.5%

Fig.2

Discussion

- The total number of AV vials given was the strongest predictor of billed charges.
- The majority of patients received an initial dose of 3 vials which is consistent with the package insert description
- A large majority 43.6% receiving 1 vial of AV is likely reflective of efforts to minimize charges incurred by the patient and perceived as judicious use of resources, however could actually amount to higher costs in both additional time and AV expenditure
- Despite this attempt by healthcare providers to use as few vials as possible, most patients required 3 or more vials of AV for full resolution of envenomation.
- Poor correlation between total hospital cost and billed charges remains unclear but may suggest complexities and discrepancies between various second party health payer systems.

Conclusions

- Total number of AV vials administered was the strongest predictor of total billed charges.
- Despite apparent attempts by healthcare providers to minimize vials of AV given the majority of patients required 3 or more vials of AV.

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