

# Rattlesnake Envenomations In Children: Are They More Severe Than Envenomations In Adults?

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## INTRODUCTION

Pediatric and adult rattlesnake envenomations are considered a life-threatening medical emergency and account for the highest incidence of mortality and morbidity in the United States over any other native venomous snake species. In the Arizona Poison and Drug Information Center (APDIC) 2019 Annual Report, rattlesnake bites accounted for 179 of bite/sting cases, a reported 15% increase since 2018. It was also reported that those aged 0-18 years accounted for 15.2% of rattlesnake bites in 2019.<sup>1</sup> Correspondingly, pediatric snakebite envenomations are an important public health concern and it is imperative that healthcare providers are informed on the management of the envenomed pediatric patient. Thus, there is a need to compare available data in both populations, to better understand how to properly manage envenomations regardless of patient age.

## OBJECTIVES

The objectives of this study is to compare characteristics, clinical treatments, severity, and outcomes in pediatric rattlesnake envenomation cases as compared to adults to better understand the current differences in envenomation management between the two populations.

## METHODS

This is a retrospective descriptive study utilizing the electronic medical records from the Arizona Poison and Drug Information Center (APDIC). Rattlesnake bites requiring care at a healthcare facility and followed to the outcome by the APDIC between January 1, 2017, and September 30, 2020, were included. Dry bites, cases transferred to another poison center, cases where the patient left against medical advice, or otherwise unable to be followed to the outcome were excluded.

## RESULTS

There was no significant difference in the amount of antivenom vials used between the adult and pediatric groups ( $p = 0.503$ ). Also, there was no significant difference between the mean Abbreviated Snakebite Severity Score (ASSS) between both the adult and pediatric groups ( $p = 0.373$ ). Other symptoms that were evaluated showed no significant differences in coagulopathy, late coagulopathy, peak edema, and hematologic toxicities.

### Primary and Secondary Outcomes

Outcome	Pediatrics	Adults	p-value
<b>Primary Outcome</b>			
Total number of anti-venom vials used (Mean, SD)	15.4 (57.5)	15.1 (5.87)	0.503 <sup>a</sup>
<b>Secondary Outcomes</b>			
<b>More than 1 loading dose of antivenom needed (N;%)</b>			
Yes	40 (56%)	183 (47%)	0.517 <sup>b</sup>
No	31 (44%)	207 (53%)	
<b>Hematologic Platelets or Fibrinogen (N; %)</b>			
>150	37 (52%)	214 (55%)	0.776 <sup>b</sup>
100-150	11 (16%)	72 (19%)	
50-100	8 (11%)	41 (10%)	
20-50	6 (8%)	31 (8%)	
Undetectable	9 (13%)	32 (8%)	
<b>Neuro-Systemic Symptoms (N;%)</b>			
Present	4 (6%)	33 (8%)	0.634 <sup>b</sup>
Not present	67 (94%)	357 (92%)	
<b>Peak Edema (N; %)</b>			
None	0 (0%)	1 (0.3%)	0.678 <sup>c</sup>
5 – 7cm	13 (18.2%)	92 (23.6%)	
< ½ of extremity	39 (54.9%)	209 (53.6%)	
> ½ of extremity	18 (25.4%)	77 (19%)	
Beyond extremity	1 (1.4%)	11 (3%)	
<b>Blebs/Bullae (N; %)</b>			
Present	18 (25%)	66 (17%)	0.096 <sup>b</sup>
Not present	53 (75%)	324 (83%)	
<b>Abbreviated Snake Severity Score (Mean; SD)</b>	3.4 (2.14)	3.1 (1.59)	0.373 <sup>a</sup>
<b>Late Coagulopathy (N; %)</b>			
None	45 (66%)	186 (60%)	0.513 <sup>c</sup>
Recurrent	15 (22%)	70 (23%)	
Delayed	8 (12%)	53 (17%)	
<b>Adverse Reaction to Antivenom (N; %)</b>			
None	69 (97.2%)	371 (95.1%)	0.417 <sup>c</sup>
Anaphylactoid	0 (0%)	7 (1.8%)	
Anaphylaxis	1 (1.4%)	1 (0.3%)	
Serum Sickness	1 (1.4%)	7 (1.8%)	
Other	0 (0%)	4 (1%)	

<sup>a</sup> p-value is for a Mann-Whitney Test

<sup>b</sup> p-value is for a Fisher's Exact Test

<sup>c</sup> p-value is for a Pearson Chi-Square Test

## DISCUSSION

In comparing this study with the limited amount of current data available, further demonstrates that characteristics, clinical treatments, severity, and outcomes in the pediatric populations do not significantly differ to the data found in the adult population. Taking these results into consideration, antivenom treatment should be approached by the severity of the envenomation in both pediatric and adult populations; underdosing a pediatric patient has the greatest risk of mortality and morbidity.

## CONCLUSION

The purpose of this study was to compare characteristics, clinical treatments, severity, and outcomes in pediatric rattlesnake envenomation cases as compared to adults to better understand the current differences in envenomation management between the two populations. The findings are consistent with other published literature that show that there are no significant differences between pediatric and adult patients, when it comes to rattlesnake envenomations, treatment should be based on clinical severity regardless of patient age.

## REFERENCES

1. Arizona Poison and Drug Information Center. (n.d.). 2019 ANNUAL REPORT. [https://azpoison.com/sites/default/files/apdic\\_annual\\_report\\_2019.pdf](https://azpoison.com/sites/default/files/apdic_annual_report_2019.pdf)
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