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ORIGINAL ARTICLE

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Efficacy of anti-scorpion venom serum over prazosin in the management of severe scorpion envenomation

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:: Abstract

Background : Scorpion venoms cause a massive release of neurotransmitters. Either anti-scorpion venom serum (AScVS) or prazosin has been used in the management of severe scorpion envenomation. **Aims :** To compare the time taken for clinical recovery by patients with severe scorpion envenomation after AScVS therapy with that following prazosin therapy. **Settings and Design :** A prospective, open-labeled clinical trial was undertaken to compare the effects of the AScVS and/or prazosin on clinical recovery in scorpion-stung patients. **Materials and Methods :** Eighty-one patients from rural districts of Maharashtra presenting with severe scorpion envenomation were assigned to three treatment groups (AScVS: n = 28; prazosin: n = 25; AScVS + prazosin: n = 28). Severity of scorpion envenomation was graded using a proposed composite clinical scoring system to assess the therapeutic efficacy. AScVS was administered as an intravenous slow bolus, ranging from 40 to 100 ml, depending on the severity of envenomation. Prazosin was given as 1 mg every 3 h. **Statistical Analysis Used :** The non-parametric "Kruskal-Wallis" test was used in the statistical analysis and a P-value of 0.05 was considered significant. **Results :** Mean composite scores of patients from the three groups at the time of admission were comparable. Complete clinical recovery was noted in 4.14 ± 1.6 h and 19.28 ± 5.03 h in the subjects who were administered AScVS and prazosin, respectively (P < 0.001). There was no incidence of anaphylactic reaction to AScVS. **Conclusions :** Intravenous slow bolus of AScVS given based on the clinical severity of envenomation leads to early recovery than prazosin alone and is well tolerated.

Keywords: *Mesobuthus tamulus concanensis* pocock (Indian red scorpion), anti-scorpion venom serum, prazosin

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:: Introduction

Scorpion venoms cause a massive release of neurotransmitters that contribute to the clinical symptoms resulting from envenomation. ^[1] The symptoms and signs show either cholinergic or adrenergic predominance, like profuse sweating, priapism, ^[1] bradycardia, increased salivation, vomiting or transient hypertension followed by hypotension, tachycardia and signs of circulatory failure, tachypnea, pulmonary edema, tingling numbness and restlessness. ^[2] This overstimulation of the autonomic nervous system leads to morbidity as well as mortality.

Mesobuthus tamulus concanensis pocock is the only poisonous species of scorpion in the west coastal region of Maharashtra. ^[3] One milliliter of reconstituted Anti-scorpion venom serum (AScVS) neutralizes 1.0 mg of dried scorpion venom. ^[3] The certain lethal dose (CLD) value of Indian red scorpion venom is 40 μ g per 0.5 ml of injected dose given IV in 18-20 g mice. ^[3] Some investigators have demonstrated the effectiveness of scorpion anti-venom in decreasing the circulating venom, ^{[4],[5],[6],[7]} and others have questioned its effectiveness. ^{[8],[9],[10]}

The scorpion anti-venom dose requirement is much higher for complete clinical recovery in more serious patients. ^{[6],[11],[12]} Intravenous slow bolus doses hasten the recovery. ^{[6],[11],[12],[13]} A strong correlation was found between clinical symptoms of the envenoming and the level of the scorpion venom antigens in the serum, ^[7] implying that variable doses of AScVS are necessary to neutralize the changeable quantity of scorpion venom. Adults required a doubled dose of scorpion anti-venom than children, ^[11] which is attributed to greater body mass, or, in similar clinical settings, adults may have received a higher quantity of venom in the context of severity.

The data available regarding efficacy of either AScVS or prazosin is, however, generated through experiences gathered in diverse clinical settings. ^{[11],[14]} Hence, it was decided to assess the clinical outcome of therapy with AScVS with that of prazosin on time taken for clinical recovery in patients with severe scorpion envenomation. As there was no study performed with the combination of prazosin with AScVS before, it was decided to have another group with the combination to detect the outcome trend.

:: Materials and Methods

The mean recovery time after scorpion envenomation of 10 h with AScVS and 27 h with prazosin have been reported in the literature. To obtain statistical significance with an alpha error of 0.05 and Power of 80% or beta error of 80%. (I will have to consult the statistician.) a sample size of 20 patients in each group with a 1:1 randomization was computed. Considering that the study would be carried out at multiple centers in rural areas of Maharashtra, it was decided to enroll at least 30 patients to get data of 20 evaluable patients.

The study was planned as an open-label, prospective, parallel design trial at three rural hospitals during September 2006 and December 2007. Approval of the Inter-System Biomedical Ethics Committee, Bhavan's SPARC, Mumbai, was obtained for the study. Patients presenting with the history of scorpion sting between the age group of 12 and 70 years were recruited after written informed consent. Apart from history and signs and symptoms of scorpion envenomation, history of scorpion being seen was elicited to confirm the diagnosis. Time of the scorpion sting was recorded. Based on the signs and symptoms of the scorpion-stung victims, a clinical scoring system for dose requirement is proposed based on sweating, pulse rate, respiratory rate, blood pressure, central nervous system (CNS) effects and presence of priapism for proper therapeutic dosage schedule.

The proposed score was devised to help in assessing the efficacy of the therapeutic regimen. This clinical composite score (CCS) was computed for each patient ^[Table 1]. The maximum CCS that could be attained was 25 and the minimum was 0. Patients with CCS 5-21 were included in the study and informed consents were taken. Those with CCS of <5 were observed for 4 h for improvement/deterioration.

CCS	Signs/Symptoms
0	1. No sweating
1	1. Sweating
2	1. Sweating
3	1. Sweating
4	1. Sweating
5	1. Sweating
6	1. Sweating
7	1. Sweating
8	1. Sweating
9	1. Sweating
10	1. Sweating
11	1. Sweating
12	1. Sweating
13	1. Sweating
14	1. Sweating
15	1. Sweating
16	1. Sweating
17	1. Sweating
18	1. Sweating
19	1. Sweating
20	1. Sweating
21	1. Sweating
22	1. Sweating
23	1. Sweating
24	1. Sweating
25	1. Sweating

Table 1 :Clinical composite score system

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Electrocardiogram was performed immediately after admission and after 4 h. Blood was collected for biochemical investigations. The patients were assigned to either of the three treatment groups, viz. AScVS alone, prazosin alone or AScVS + prazosin, as they presented to the hospital. Treatment schedule was explained and time of starting the treatment was recorded.

AScVS alone

AScVS was procured as F(ab')₂ fraction from Haffkine Biopharma, Mumbai, India. (Batch No. 407) and administered only after a test dose (0.1 ml SC). The dose was decided based on the CCS and age group of the patient ^[Table 2].

For this, a vial of AScVS was dissolved in 10 ml distilled water and injected IV over a period of 5-7 min.

Composite clinical score	Vials of AScVS	
	Age	Age
	>12 to 14 years	>14 years
>5 to 10	2	4
>10 to 15	3	6
>15 to 21	4	0
One vial = 10 ml		

Table 2 :Selection of AScVS dose based on composite clinical score

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Prazosin alone

Prazosin (1 mg, SUN Pharma , SUN Pharmaceuticals India Ltd. Acme plaza, Andheri Kurla road. Andheri (E) Mumbai. 4000059. Mumbai, India. Batch No. GK 60559) was given as 500 μ g for patients having 15-20 kg body weight and 1 mg for those above 20 kg body weight every 3 h orally till complete recovery.

Combination AScVS and prazosin therapy

Oral prazosin immediately followed by AScVS IV bolus, as mentioned above, was administered. Prazosin was repeated every 3 h until complete recovery.

Concomitant medications included frusemide 10-20 mg, aminophylline 5 mg/kg and oxygen whenever necessary for pulmonary edema. Supportive therapy (e.g., IV fluids if there was severe perspiration) was administered at the discretion of the attending physician.

Follow-up clinical examination was carried out at 1, 2, 4, 8, 16 and 24 h or till the time of complete recovery, whichever is earlier. Time of first recovery sign (increase in pain at the sting site) ^[11] and time of complete recovery was recorded.

The primary end point was considered as time taken for complete recovery. Complete recovery following the scorpion sting was defined as CCS <3, when grades for CNS, pulse, respiratory rate or blood pressure are 1 or 0 and no increase occurs in the next 4-8 h.

Biochemical investigations were repeated at 4 h. The mean time for complete recovery in the individual group was calculated.

Descriptive statistics (mean, median and range) was used to summarize the continuous data such as age, time lapse, recovery time and composite score in the three treatment groups, and the frequency table was generated for categorical variables such as sex, sweating, etc.

The chi-square test was used to determine the association between categorical variables (sex, sweating and tachycardia) and the three treatment groups. The non-parametric "Kruskal-Wallis" test was used to determine any difference between the three treatment groups and age, time lapse, composite score and recovery time due to non-normal distribution. The significance level was set at 0.05. SPSS Version 14.0 for windows was used for analysis.

:: Results



Eighty-three consecutive patients were recruited in the study from three hospitals. Patients were enrolled as they presented to the hospital. The demographic data and clinical findings ^[Table 3] of patients were comparable in the three groups. Hemogram and blood sugars were performed in all patients. Leucocytosis was noted in 98% of the patients. The mean blood sugar was 219.3 mg/dl at the time of admission and 125.8 mg/dl at 4 h after admission. The number of patients presenting with pulmonary edema and hypotension was higher in the group given AScVS, although the difference was not significant statistically. The mean baseline CCS were comparable (11.43 ± 2.79 for AScVS, 9.12 ± 2.68 for prazosin and 9.46 ± 2.65 for combination therapy). However, as depicted in ^[Table 4], in the AScVS group, only 42.9% of the patients had a CCS in the range of 5-10 as compared with 60.72% in the prazosin group and 71.4% in the combination group ($P < 0.05$). Similarly, a larger number of patients with baseline CCS above 16 were seen in the AScVS group (14.2%) than in the other two groups (3.6-4%).

	AScVS (n = 28)	Prazosin (n = 25)	AScVS + prazosin (n = 28)	P value
Age (years)	26.5 $\pm$ 15.69	30.88 $\pm$ 15.54	37.39 $\pm$ 17.81	0.059
Sex (M:F)	18:10	10:15	19:9	0.086*
Pulmonary edema	9 (32)	4 (16)	2 (7)	0.051*
Tachycardia	5 (18)	1 (4)	2 (7)	0.20*
Bradycardia	4 (14)	5 (20)	5 (18)	0.974*
Hypertension	7 (25)	7 (28)	9 (32)	0.838*
Hypotension	3 (11)	0 (0)	0 (0)	0.052**
Sweating	15 (54)	10 (40)	13 (46)	0.61*
Pruritus	7 (25)	2 (8)	5 (18)	0.59*

*Chi-square test, Figures in parentheses are in percentage

Table 3 :Demographic data of the patients

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Treatment group	Time lag (h)						Baseline CCS	
	<1	1-2	>2-5	>5-10	20-30	5-10	11-25	16-21
AScVS	7 (25)	11 (39)	7 (25)	1 (4)	2 (7)	12 (43)	12	4 (14)
Prazosin	4 (16)	10 (40)	0 (0)	0 (0)	0 (0)	16 (64)	8 (32)	1 (4)
AScVS + prazosin	4 (14)	18 (64)	1 (4)	0 (0)	0 (0)	10 (36)	7 (25)	1 (4)

Figures in parentheses are in percentage, CCS = Clinical composite score

Table 4 :Time lag between scorpion sting and reporting to the hospital and baseline CCS

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All the groups were comparable with respect to time lag between scorpion sting and reporting to the hospital (AScVS: 3.63 ± 6.67 h; prazosin: 1.93 ± 0.94 h; combination: 1.99 ± 1.74 h). ^[Table 4] illustrates the number of patients reporting at different time intervals. Of the 27 patients given prazosin, two patients were withdrawn from the study due to deterioration.

In patients treated with AScVS or the combination, first signs of recovery were evident after 1 h of the therapy,

while in the prazosin-treated group, recovery signs were seen only after 8 h. The mean time for complete recovery was 4.14 ± 1.6 h in the group treated with AScVS. Twenty-two of 28 patients recovered within 5 h of injection. As against this, none of the patients given prazosin showed complete recovery in the first 10 h. The complete recovery time was 19.28 ± 5.03 h in the group treated with prazosin ($P < 0.001$ vs. AScVS). When the combined regime of AScVS + prazosin was used, the time for complete recovery shortened to 3.46 ± 1.10 h, which was comparable to AScVS [Table 5].

Group	AScVS		Prazosin		AScVS + prazosin		P value
	Mean $\pm$ SD	Median (IQR)	Mean $\pm$ SD	Median (IQR)	Mean $\pm$ SD	Median (IQR)	
Recovery time	4.14 ± 1.6	4.0 (1.0-8.0)	19.28 ± 5.03	18.0 (0-24)	3.46 ± 1.1	3.0 (0-5)	<0.001
Composite score	11.43 ± 2.795	11.0 (8.0-13.0)	9.12 ± 2.68	9.0 (6.0-11.0)	9.46 ± 2.54	9.0 (6.0-11.0)	0.007
Time lapse	9.4 ± 6.668	2.0 (0-12)	1.92 ± 0.943	2.0 (0-10)	1.99 ± 1.47	1.74 (0-32)	0.919

Table 5 :Recovery time, composite score and time lag in various treatment groups

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Additional features observed in the individual group are described below :

AScVS alone

The earliest reporting time in this group was 15 min, with the exception of two who presented at a later stage (23 and 30 h after sting). These patients recovered at 8 h.

Patients with CCS >16 ($n = 4$) had a recovery time that ranged from 4 to 8 h. Nine of 28 patients reported with pulmonary edema, but recovered within 2-8 h (median, 4 h) after receiving AScVS. Six to eight AScVS vials were required as a mean dose, except for one patient who required a higher dose of seven vials, with a recovery time of 8 h.

None of the patients treated with intravenous AScVS exhibited allergic reactions.

Prazosin alone

The earliest reporting time in this group was 25 min, and the maximum was 4 h 15 min.

In five of the 19 patients given prazosin, the CCS remained unchanged during the first hour; 14 showed an increase in the CCS. The mean CCS of these 19 patients was significantly higher (9.79 ± 2.51) compared with baseline values (8.89 ± 2.73 ; $P < 0.05$). When data of all 25 patients was considered, values of CCS did not change during the first 2 h (baseline: 9.12 ± 2.68 , 1 h: 9.25 ± 2.43 , 2 h: 8.96 ± 2.54). CCS then gradually declined over the next few hours. Even after complete recovery, these patients were found to be exhausted.

There were six patients who presented with hypertension (BP ranging from 180/106 to 162/102 mmHg). Of these, three (50%) developed pulmonary edema after start of the treatment with prazosin. Of these, two young patients (ARJ, M, 12 years and PPB, M, 13 years) exhibited pulmonary edema with severe tachycardia after 15 and 18 h, respectively, and were withdrawn from the study. They were given additional therapy with AScVS and recovered completely subsequently. One of these patients required a higher dose. As against these young patients, the third patient (RRM, F, 32 year) developed mild pulmonary edema after 4 h, but was managed with prazosin and adjunctive treatment (without AScVS). She recovered after 30 h.

Prazosin + AScVS

The earliest reporting time of patients from this group was 15 min and the maximum was 9.5 h after the sting. All patients required only one dose of prazosin and showed complete recovery by the time the second dose was due. Nine patients presented with hypertension. Three patients had grade 4 hypertension (BP 200/110 mmHg) and six patients had grade 3 hypertension. Out of six patients with grade 3 hypertension, two patients showed recovery at 2 h while the others recovered at 4 h. Efficacy with the AScVS + prazosin combination was superior in the subset of patients with hypertension.

:: Discussion



Scorpion anti-venom is considered an effective treatment by many investigators worldwide. [11],[13],[15],[16],[17],[18] The other treatment modalities preferred are prazosin, [9],[14],[19] dobutamine, [20],[21] captopril [22] and insulin. [2] Ionotropic support with dobutamine is advocated to treat the cardiotoxicity. Captopril reduces afterload and relieves pulmonary edema and enhances cardiac output. Insulin allows the incorporation of fatty acids into triglycerides in the liver and in adipose tissues. Glucose infusion along with insulin suppresses fat mobilization by favoring re-esterification.

Scorpion anti-venom directly neutralizes the venom in the circulation as well as that present at the other body compartments. The alpha blocker treatment is directed toward neutralizing the effects of the overstimulated autonomic nervous system. Prazosin is an alpha adrenoreceptor antagonist that stimulates insulin secretion.

There is a need for standard treatment protocol using scorpion anti-venom and drugs, [23] as these multiple modalities confound the problems of medical officers working at the peripheral parts of rural India. This is the first study conducted in a rural setting of coastal regions of Maharashtra, western India, which allows comparison of the effects of AScVS and prazosin on recovery time in patients with severe scorpion envenomation. The time taken for complete recovery was significantly less in patients given AScVS than in those given prazosin. Once the venom is neutralized, the catecholamines responsible for the deleterious effects of envenomation disappear faster because of their short span of activity of 1-2 min. AScVS doses required in this study for *in vivo* neutralization of venom were as large as 100 ml.

The studies using 20 ml bivalent scorpion anti-venom or 20-30 ml AScVS or 5-15 ml scorpion anti-venom injected intramuscularly (IM) or IV (as per manufacturer's instructions), on the contrary, failed to induce clinical recovery or delayed the recovery. [8],[9],[10] Ismail [16] has criticized the doses used in these studies, [10] suggesting that 20-times higher doses should have been used to neutralize the venom. Experiments have shown that a high dose of scorpion anti-venom was needed to reach the concentration required to neutralize the diffused scorpion venom in slowly accessible tissue compartments of the body. [12] The F(ab')₂ fraction of scorpion anti-venom on IM injection undergoes slow and incomplete absorption. [12]

Considering the severity, scorpion anti-venom needs to be injected IV in doses higher than the doses calculated to neutralize the venom. [12] Large doses (up to 80 ml, i.e. eight vials) were needed in clinical practice depending on the severity of envenomation. [11]

There was no anaphylactic reaction noted in any of the patients when AScVS was given slowly IV in the present study. No anaphylactic reaction has been reported after using AScVS in 48 patients. [11] Anaphylaxis is rare probably due to the large quantities of circulating adrenaline being released during envenomation. [11],[16] In the present study, the patients had severe envenomation, with systemic manifestations of catecholamine surge. In patients without systemic manifestations, however, catecholamine levels are low, and in these patients, scorpion anti-venom should not be used. Moreover, constant improvements and standardization of all the steps involved in anti-venom production, purification and quality control have resulted in pure, safe and efficient F(ab')₂ fraction with no side-effects when used intravenously. [24]

The efficacy of AScVS administered in patients coming late after sting has been questioned. [8],[25] However, as seen from our data, in patients reporting after 18-20 h of sting, AScVS was beneficial. Two patients developed pulmonary edema after 15 and 18 h of prazosin treatment and were withdrawn from the study and were treated with AScVS, showing, eventually, complete recovery. Higher doses than the computed ones were required in two of them, which led to recovery without any adverse reactions.

Prazosin is advocated for scorpion sting because of its antagonistic effects against sympathetic overactivity, oral administration, ease of availability and affordable cost. [9]

The initial deterioration in clinical scores following prazosin may be due to its delayed absorption on oral administration. Prazosin does not neutralize the venom in the body and hence is needed to be given every 3-hourly till venom is lost from the body, which has a long half-life of 24 h. [16],[26] The patients appeared exhausted and fatigued after recovery, possibly due to the prolonged blockade of the sympathetic system.

Two patients in the present study who were given prazosin needed withdrawal due to the development of late pulmonary edema with severe tachycardia. Development of pulmonary edema in patients on the way of recovery in spite of 3-hourly administration of prazosin has also been reported earlier. [14] Prazosin-resistant cases need inotropic support. [20] This emphasizes continuous monitoring for 24 h by a cardiac expert, which is a rarity in rural India. These observations favor the use of AScVS in scorpion envenomation.

Patients in the combination group (AScVS + prazosin) showed early recovery, as observed in the AScVS group. The patients needed only one dose of prazosin as they showed recovery when the second dose was due. Patients with an initial phase of accelerated hypertension responded well to the combination therapy.

Limitation of the study included lack of randomization. This occurred primarily because of problems in the rural setting regarding communication, patient's demand for AScVS injection instead of oral medication and, to some extent, a clinician's bias toward higher use of AScVS because of faster recovery. Higher incidence of complications like pulmonary edema and hypotension in the AScVS group is attributed to patients opting for AScVS as a self-perceived better mode of treatment for the severity. Notably, the recovery time was significantly lesser in the AScVS-treated group.

AScVS therapy is of utility because of its short recovery period, and can be used even when trained manpower and cardiac expertise are not available. A strong correlation exists between clinical symptoms of envenomation and level of scorpion venom antigens in serum. [7] To quantify the clinical changes, CCS was proposed and used based on the previous experience. [11] It was used to calculate the large and variable doses of AScVS to neutralize the changeable quantity of scorpion venom present in more serious victims. Such a system can be an asset for the physicians in rural areas. Neutralization of venom was thus proved to be better than therapy for complication.

In conclusion, from the experience of the present study, we put forth the following recommendations:

1. Physicians should use the proposed CCS to decide the severity of clinical condition as well as the dose of antivenin. The proposed score can be further validated in future studies.
2. If there are no systemic signs (only severe pain and sweating confined to that particular extremity and CCS 0-3), AScVS should not be used. Such patients should be observed for the next 6 h.
3. For patients with systemic manifestations, a test dose of AScVS should be given. Fifteen minutes later, intravenous slow bolus of AScVS, computed based on CCS, should be given.
4. For patients with scores 5, 10 or 15, if required, one may go to the next group of CCS range to select the AScVS dose. This may especially be advised for those patients who report late (>20 h or so) with pulmonary edema or those in semiconscious or unconscious states. These patients also need close monitoring. It is better to give a higher dose rather than to undertreat the patient, leaving behind the venom to cause delayed effects.
5. Prazosin should be reserved for patients presenting with hypertension and pulmonary edema. In these

patients too, AScVS should be administered to neutralize the venom and achieve clinical recovery faster. Only one dose of prazosin suffices when given with AScVS, as complete recovery would be seen when the next dose is due.

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Tables

[\[Table 1\]](#), [\[Table 2\]](#), [\[Table 3\]](#), [\[Table 4\]](#), [\[Table 5\]](#)

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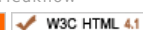


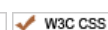
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Table 1 :Clinical composite score system

Criteria	Grade	Symptoms
Pain	0	Pain at sting site, as only symptom
Sweating	0	Limited to the extremity of the sting site
	1	Minimal sweating all over the body, slight nasal secretions
	2	Generalized sweating with rigors and cold extremities
	3	Generalized profuse sweating causing wetting of clothes and bed sheets and cold, clammy skin
Pulse rate	0	70–90
	1	>91 to 100
	2	>101 to 120 or <70
	3	>121 to 140 or <60 or irregular pulse even if between 60 and 90
	4	>141 to 160
	5	>161
Respiratory rate	0	<20
	1	>21 to 30
	2	>31 to 40 without crepitations
	3	>31 to 40 with crepitations
	4	>41 with crepitations
	5	>50 with crepitations and/or cyanosis
Blood pressure	0	120/80
	1	Systolic: >120 to 140 and diastolic: >80 to 90
	2	Systolic: >141 to 160 and diastolic: >91 to 100
	3	Systolic: >161 to 180 and diastolic: >101 to 110 or systolic: <100
	4	Systolic: >181 to 200 and diastolic: >111 to 120 or systolic: <80
	5	Systolic: >201 and above and diastolic: >121 or systolic: <60
CNS effects	0	No sensory involvement
	1	Minimal tingling numbness around the mouth
	2	Tingling, numbness around mouth and giddiness
	3	Altered sensorium, rowdiness present
	4	Patient semiconscious
	5	Patient unconscious
Priapism	2	Slight erection
	3	Strong erection

Table 2 :Selection of AScVS dose based on composite clinical score

Composite clinical score	Vials of AScVS	
	Age	Age
	>12 to 14 years	>14 years
>5 to 10	2	4
>10 to 15	3	6
>15 to 21	4	8

One vial = 10 ml

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Table 3 :Demographic data of the patients

	AScVS (n = 28)	Prazosin (n = 25)	AScVS + prazosin (n = 28)	P value
Age (years)	26.5 ± 13.69	30.88 ± 13.54	37.39 ± 17.81	0.059
Sex (M:F)	18:10	10:15	19:9	0.086*
Pulmonary edema	9 (32)	4 (16)	2 (7)	0.051*
Tachycardia	5 (18)	1 (4)	2 (7)	0.20*
Bradycardia	4 (18)	5 (20)	5 (18)	0.974*
Hypertension	7 (25)	7 (28)	9 (32)	0.838*
Hypotension	3 (11)	0 (0)	0 (0)	0.052*
Sweating	15 (54)	10 (40)	13 (46)	0.61*
Priapism	7 (25)	2 (8)	5 (18)	0.26*

*Chi-square test, Figures in parentheses are in percentage

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Table 4 :Time lag between scorpion sting and reporting to the hospital and baseline CCS

Treatment group	Time lag (h)					Baseline CCS		
	<1	1-2	>2-5	>5-10	20-30	5-10	11-15	16-21
AScVS	7 (25)	11 (39)	7 (25)	1 (4)	2 (7)	12 (43)	12 (43)	4 (14)
Prazosin	4 (16)	10 (40)	11 (44)	0 (0)	0 (0)	16 (64)	8 (32)	1 (4)
AScVS + prazosin	6 (21)	10 (36)	11 (39)	1 (4)	0 (0)	20 (71)	7 (25)	1 (4)

Figures in parentheses are in percentage, CCS= clinical composite score

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Table 5 :Recovery time, composite score and time lag in various treatment groups

Group	AScVS		Prazosin		AScVS + prazosin		P value
	Mean ± SD	Median (SEM)	Mean ± SD	Median (SEM)	Mean ± SD	Median (SEM)	
Recovery time	4.14 ± 1.604	4.0 (0.303)	19.28 ± 5.029	18.00 (1.006)	3.46 ± 1.105	4.00 (0.209)	<0.001
Composite score	11.43 ± 2.795	11.00 (0.528)	9.12 ± 2.682	9.00 (0.536)	9.46 ± 2.646	9.00 (0.500)	0.007
Time lapse	3.6 ± 6.668	2.00 (1.26)	1.93 ± 0.941	2.00 (0.188)	1.99 ± 1.74	1.47 (0.328)	0.910

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