**Journal of Advanced Medical and Dental Sciences Research**

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

# Original Research

## Assessment of use of polyvalent anti-snake venom in patients

Sukhpreet Singh

Assistant Professor, Department of Pharmacology, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

***ABSTRACT:***

**Background:**Envenomation with poisonous snakes, also known as snakebite, occurs when a venomous snake injects venom into a person through its fangs. The present study was conducted to assess use of polyvalent anti-snake venom in patients. **Materials & Methods:**78 patients of snake biteof both genders were selected. Parameters such as type of snake bite and its severity, details of ASV administration, premedication, occurrence of early adverse reactions to ASV, clinical outcomes etc. were recorded. **Results:** Out of 78 patients, males were 50 and females were 28. Indication of ASV was neurotoxicity in 28, vasculotoxicity in 15, and neurotoxicity+ vasculotoxicity in 35. Prophylactic premedication was pheniramine+ Hydrocortisone in 46, only hydrocortisone in 20 and not given in 12 cases. Supportive treatment was fresh frozen plasma in 7, packed cell volume in 10 and neostigmine in 13 patients. Mortality was due to neurotoxicity in 7 and vasculotoxicity in 5 cases. Early reactions to ASVwas anaphylaxis in 19, urticaria in 5, hypotension in 11, vomiting in 4 and acute renal failure1 patient. The difference was significant (P< 0.05). **Conclusion:** There are increased death rates from neurotoxic snake bites, a quarter of patients needing a high ASV dose (>30 vials), and an overuse of neostigmine and prophylactic premedication.

**Keywords:**Envenomation, snakes,

Received: 21 October, 2020 Accepted: 26 November, 2020

**Corresponding author:** Sukhpreet Singh, Assistant Professor, Department of Pharmacology, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

**This article may be cited as:** Singh S. Assessment of use of polyvalent anti-snake venom in patients. J Adv Med Dent Scie Res 2020;8(12):284-287.

## INTRODUCTION

Envenomation with poisonous snakes, also known as snakebite, occurs when a venomous snake injects venom into a person through its fangs. This can happen accidentally if a person disturbs or steps on a snake, or intentionally in cases of handling snakes, such as in snake handling shows or when handling pet snakes.[1]The severity of snakebites varies depending on factors such as the type of snake, the amount of venom injected, the location of the bite, and the health of the victim. Venomous snakes inject venom primarily to immobilize prey, but when humans are bitten, the venom can cause a range of symptoms.[2]These may include pain, swelling, redness, and bruising around the bite site. Some venomous snakes can cause tissue damage or necrosis (death of tissue) in severe cases.Venom can affect various body systems, leading to symptoms such as nausea, vomiting, sweating, dizziness, weakness, difficulty breathing, changes in heart rate, and in severe cases, paralysis or organ failure.[3]

The prompt delivery of snake antivenom is the only effective way to stop or reverse the majority of the symptoms resulting from a poisonous snake bite. In India, four major venomous snakes are used to make polyvalent anti-snake venom (ASV), which is raised in horses and used to treat snake bites. These snakes are the Indian cobra (Naja naja), Indian krait (Bangarus caeruleus), Russell's viper (Daboia russelii), and sawscaled viper (Echiscarinatus). Regionally tailored ASV use surveillance is justified by a number of criteria.[4] It is not reasonable to believe that polyvalent ASV will always work in cases of dangerous snake bites. The idea of the "Big Four" is coming under more and more scrutiny as more snake species that are known to exist in specific regions of the nation are recognized. Additionally, the observation of intraspecies differences in the composition of venom andvarying antigenicity is also well-documented.[5]The present study was conducted to assess use of polyvalent anti-snake venom in patients.

## MATERIALS & METHODS

The present study consisted of 78 patients of snake biteof both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Parameters such as type of snake bite and its severity, details of ASV administration, premedication, occurrence of early adverse reactions to ASV, clinical outcomes etc. were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## RESULTS

**Table I Distribution of patients**

| Total- 78 | | |
|---|---|---|
| **Gender** | **Male** | **Female** |
| Number | 50 | 28 |

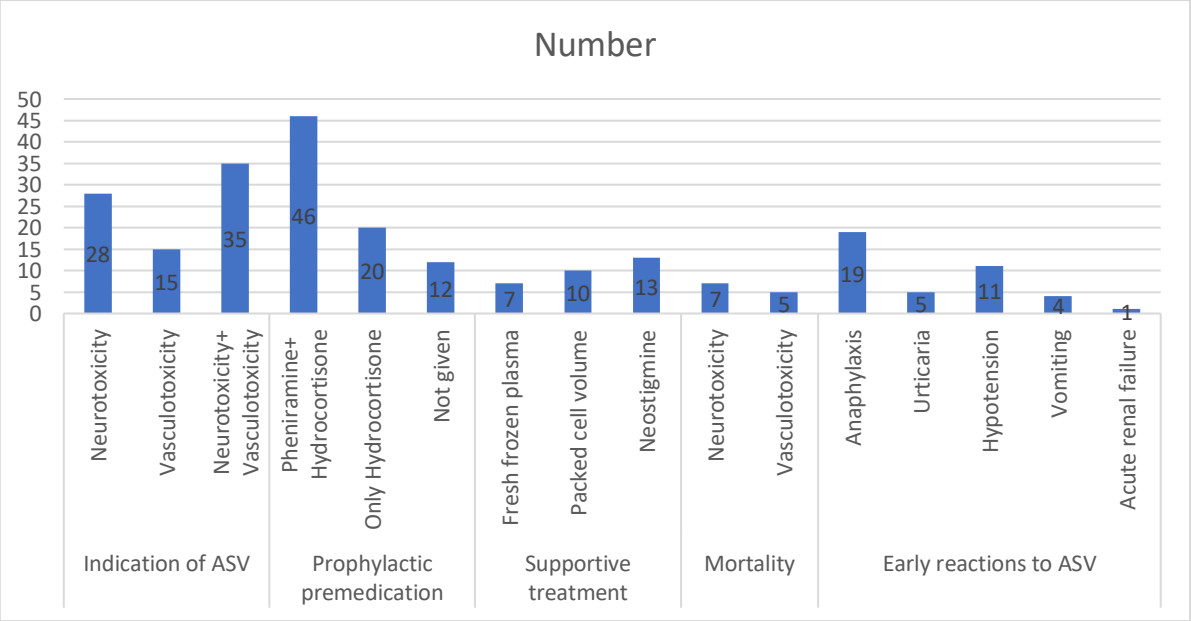
Table I shows that out of 78 patients, males were 50 and females were 28.

**Table II Assessment of parameters**

| Parameters | Variables | Number | P value |
|---|---|---|---|
| Indication of ASV | Neurotoxicity | 28 | 0.05 |
| | Vasculotoxicity | 15 | |
| | Neurotoxicity+ Vasculotoxicity | 35 | |
| Prophylactic premedication | Pheniramine+ Hydrocortisone | 46 | 0.01 |
| | Only Hydrocortisone | 20 | |
| | Not given | 12 | |
| Supportive treatment | Fresh frozen plasma | 7 | 0.82 |
| | Packed cell volume | 10 | |
| | Neostigmine | 13 | |
| Mortality | Neurotoxicity | 7 | 0.74 |
| | Vasculotoxicity | 5 | |
| Early reactions to ASV | Anaphylaxis | 19 | 0.03 |
| | Urticaria | 5 | |
| | Hypotension | 11 | |
| | Vomiting | 4 | |
| | Acute renal failure | 1 | |

Table II, graph I show that indication of ASV was neurotoxicity in 28, vasculotoxicity in 15, and neurotoxicity+ vasculotoxicity in 35. Prophylactic premedication was pheniramine+ Hydrocortisone in 46, only hydrocortisone in 20 and not given in 12 cases. Supportive treatment was fresh frozen plasma in 7, packed cell volume in 10 and neostigmine in13patients. Mortality was due to neurotoxicity in 7 and vasculotoxicity in 5 cases. Early reactions to ASVwas anaphylaxis in 19, urticaria in 5, hypotension in 11, vomiting in 4 and acute renal failure1 patient. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**



## DISCUSSION

Snake bite remains an important occupational hazard in South-East Asia region. The use of polyvalent ASV greatly reduces morbidity and mortality from poisonous snake bite.There could be other reasons for the insufficient effectiveness of ASV in treating neurotoxic snake bites.[6] First of all, snake venom is a complicated mixture of several toxins with various neurotoxic qualities rather than a single, homogenous toxin. While ASV or anticholinesteraseases can counteract the effects of certain postsynaptically active neurotoxins, there are other neurotoxins that attach nearly irreversibly to the nicotinic acetylcholine receptor and whose activity is not easily reversible.[7] Moreover, the motor nerve terminal degenerates as a result of presynaptically active neurotoxins with phospholipase activity. Clinical recovery is a gradual process that is dependent on motor nerve terminal regeneration.[8,9]The present study was conducted to assess use of polyvalent anti-snake venom in patients.

We found that out of 78 patients, males were 50 and females were 28. Pore et al[10] conducted a study in which 176 patients of snake bite.Univariate and multivariate analysis was performed to find out significant risk factors associated with mortality.The main indication for ASV was vasculotoxic snake bite (75%) followed by neurotoxic snake bite (16%). Mean dose of ASV was 18.63 ± 14.52 vials. Prophylactic premedication with corticosteroids alone or in combination with antihistaminic was used in more than 70% patients. Early adverse reactions to ASV were seen in 4% patients. Neurotoxic snake bite was a significant risk factor associated with mortality in multivariate analysis.

We observed that indication of ASV was neurotoxicity in 28, vasculotoxicity in 15, and neurotoxicity+vasculotoxicity in 35. Prophylactic premedication was pheniramine+ Hydrocortisone in 46, only hydrocortisone in 20 and not given in 12 cases. Supportive treatment was fresh frozen plasma in 7, packed cell volume in 10 and neostigmine in13 patients. Mortality was due to neurotoxicity in 7 and vasculotoxicity in 5 cases. Early reactions to ASVwas anaphylaxis in 19, urticaria in 5, hypotension in 11, vomiting in 4 and acute renal failure1 patient. Bawaskar et al[11], 30 individuals with suspected snake envenomation were rolled (23 cases of krait and 7 cases of cobra). A uniform data form was used to gather information about the bite site, the subject's activities at the time of the bite, local manifestations, systemic involvement, the progression of venom poisoning, and the subject's response to treatment afterward. Either the deceased specimen was examined, or clinical symptoms were combined with subject or bystander identification when preserved specimens were shown, to confirm the type of snake.Of the 23 individuals (11 men and 12 women) bitten by kraits, 2 passed away at the scene, 7 passed away in the hospital, and 14 survived. Four of the fourteen survivors needed artificial respirations using antivenom, anticholinesterase medications, and a resuscitation bag. One's bite was parched. The remaining nine made a full recovery.Of the seven subjects—five males and two females—who saw cobras, two died from their bites when they arrived at the hospital, and one passed away unexpectedly from what appeared to be a cardiac collapse after witnessing a hooded cobra on a road (no bite site was found on this individual). Antivenon, anticholinesterase medications, and/or mechanical breathing helped four patients recover.

Inamdar et al[12] evaluated the outcome, seasonal variation, and death pattern of snakebite cases admitted at the tertiary health care centre in the last 10 years.Out of 5 639 admitted snakebite cases, 65.24% were male. The 16 - 45-year age group accounted for 84.7% of cases; 46% were referred from other health centres, mostly from rural areas; 55.2% occurred during July to September, which coincided with the rainy season in this region; 94.6% of the snakebite patients survived; and 5.4% died. Case fatality rates were higher for females (8.78%) and for bites by neurotoxic snakes (8.91%).

## CONCLUSION

Authors found that there are increased death rates from neurotoxic snake bites, a quarter of patients needing a high ASV dose (>30 vials), and an overuse of neostigmine and prophylactic premedication.

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