



Role of Anti Snake Venom in Snake Bite in Third Trimester of Pregnancy

**Pediredla Sri Sowmya^a, Tanuraj Sirohi^{a#}, Nitesh Jindal^{a*}
and Sanchit Bhandari^{a†}**

^a Department of Medicine, SVSU, Meerut, Uttar Pradesh, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJMPCR/2022/v15i4314

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/92589>

Case Study

Received 07 August 2022

Accepted 12 October 2022

Published 28 October 2022

ABSTRACT

A case of pregnancy associated with neurotoxic snake bite presenting with Neuropathic symptoms and systemic envenomation complicated by disseminated intravascular bleeding is uncommon. We present a case of 22-year-old Primigravida at 32 weeks gestation with snake bite on left-hand, with left-hand swelling, nasal bleeding and neuropathic signs. At presentation, there was pallor, tachycardia, hypotension, a gravid uterus with a single live fetus, & regular fetal heart rate. Primi Gravida with venomous snake bite with Neuropathy with disseminated intravascular Coagulation was diagnosed. Conservative management with Anti Snake Venom instituted led to survival of both mother and continuation of pregnancy.

Keywords: *Anti snake venom; snake bite; pregnancy; health issues.*

1. INTRODUCTION

"Millions of people are bitten or stung by venomous animals yearly throughout the world.

the relationship of the total number of snakebites to envenoming is highly variable and may be influenced by a number of factors like. It is estimated that the number of envenoming

[°] Junior Resident III;

[#] Professor;

[†] Junior Resident I;

*Corresponding author: E-mail: niteshjindal06@gmail.com;

ranges from 421,000 to as high as 1,841,000 annually & 1,200,000 to 5,500,000 snake bites may occur globally per year” [1].

“Snake-bites remains a public health problem in most countries, even if it is difficult to be precise about the actual numbers involved. The true incidence of and mortality from snake envenomation could exceed 5 million per year, with an associated mortality level of 125000 persons per year.

About 2.5 million people are envenomed each year, half of whom request medical care, and probably more than 100000 individuals suffer from severe sequelae” [2].

“The highest burden of snakebites is in Asia and Sub-Saharan Africa, but the precise incidence is underestimated due to lack of data. However, it was recently estimated that over 314,000 bites, 7300 deaths, and nearly 6000 amputations occur from snake bites annually in Sub-Saharan Africa and Nigeria, the most common poisonous snakes are the elapids and viperids” [3].

“Much remains unknown about snakebites in India. Knowledge about the snakes responsible is still developing: the major snakes of medical importance in India have historically been considered to be: the Russell’s viper (*Daboia russelii*), the saw-scaled viper (*Echis carinatus*), the Indian cobra (*Naja naja*) and the common krait (*Bungarus caeruleus*), which together are known as the ‘Big Four’. India is the largest single contributor to the global tally of snake bite deaths, with the numbers ranging between 15,000 and 50,000 a year. Accurate statistics are not available and there is no standardized reporting of bites and identification of snakes” [4,5].

“Snakebites tend to be high in areas which have agriculture as the major occupation of the people. Coupled with the fact that there are several challenges militating against the easy access to timely and appropriate healthcare services, snakebites pose serious threat to the victim and mostly result in lasting morbidity or mortality. The majority of bites occur among people with low socioeconomic status and have been linked to the occupations such as farming, fishing, animal rearing, and hunting. The factors associated with snakebite depends on people’s occupation, thus, some cases derived from victims doing farm worker busy with other works either in the community or nearby bush, hence, exposes many to high risk of snakebite” [6-7].

“Although rare, venomous bites and stings during pregnancy may have a significant adverse effect on the fetus as well as the mother. The overall case-fatality rate in the pregnant females is approximately 4%, and the fetal loss rate approximately 20%” [8].

“The challenge in this scenario is the serious consequence to the mother in terms of coagulopathy and shock. The fetus is at grave risk of hypoxia and demise. There is also a mention of fetal anomalies and the anaphylactic reaction of the anti-snake venom serum” [9,4].

2. CASE DESCRIPTION

A 26-year-old Primi gravida period of gestation 32 weeks presented with alleged history of snakebite 12 hours back on the left-hand, while sleeping on floor at home. The snake with unidentified species escaped and later on patient developed nasal bleeding and drooping right eyelid followed by left eyelid patient was unable to keep her eyes open and developed redness and paresthesia at the site of bite. A few hours after bite she noticed nasal bleeding. she had drooping of right upper eye lid, abdominal pain, change in taste, mouth numbness, dizziness. there was no difficulty in breathing, cough, & muscle pain.

On Examination patient was conscious oriented having Glasgow Coma scale score of 15/15. Pallor was present, afebrile and anicteric. there was unilateral left-hand oedema with discoloration and excoriation along with fang mark on left hand also there was bleeding from nose but no such bleeding from oral cavity or intravenous cannula site was being reported. pulse rate was 110 beats per minute. And blood pressure was 94/62 mm Hg on Auscultation first and second heart sounds were heard and were normal, the respiratory rate was 24 cycles per minute and the chest was clear clinically.

Multidisciplinary management was instituted in conjunction with gynecologist and neurologist. Per abdominal Examination Symphyes fundal height was compatible with 32 weeks pregnancy and the fetus was in longitudinal lie and cephalic presentation, fetal heart rate was 156 beats per minute and regular. her vulva was stained with blood and digital examination was deferred. Moreover a clinical assessment of preterm contraction with antepartum hemorrhage due to venomous snake bite was made to rule out placenta previa. Laboratory investigation

revealed packed cell volume of 22 % white blood cell count 10500 cells/mm cubes and platelet count 70000 cells/mm cube. Beside clotting time was prolonged on admission which later reduced to 4 minutes after treatment was instituted. Prothrombin time was also prolonged.

PT was 21 seconds with International Normalized Ratio of 1.3, while the Activated Partial Thromboplastin Time APTT for patient was 60 seconds and control was 45 seconds. Patient had a total of three units of Fresh Frozen Plasma transfused. Moreover Liver Function Test, Kidney Function Test were in normal limit, while urine analysis shows proteinuria 1+. Indian Polyvalent Anti Snake Venom 100 ml in 1000 ml of normal saline was infused intravenously over 12 hours.

The patient recovered gradually and her symptoms of loss of taste, numbness in mouth, ptosis were recovered. Hypotension was recovered after fluid therapy, while tachycardia resolved spontaneously after 3 days.

3. DISCUSSION

India has always been known as country of snakes and snake charmers, snakes are part of the rich heritage of the Country and have always been worshiped by the natives. Venomous snakes are not uncommon and any physician working in this large country will face challenges regarding the management. Identifying the correct species or giving the correct dose of ASV is always a challenge due to paucity in the availability of proper guideline and literature people often reach health care facilities in the later part of the disease moreover hospital register complicated cases more often.

Physician need to be very vigilant and a high suspicion is required for the correct diagnosis and treatment [1].

“Snake venoms are secretions of venomous snake which are synthesized and which are stored in venomous gland. The glands which secrete the zootoxin is a modification of the parotid salivary gland and are situated on each side of head below and behind the eye encapsulated in muscular sheath. The glands have large alveoli in which venom is stored before being conveyed by the duct to the tubular fangs, through which it is injected. Snake venoms are complex mixture of enzymatic and toxic proteins, which include phospholipase A2

(PLA2s), mycotoxins, hemorrhagic metalloproteinases and other proteolytic enzymes, coagulant components, cardiotoxins, cytotoxins and neurotoxins” [10-12].

Different species have different types venom which depends upon its species, geographical location, its habitat, climate, age etc.

There are three types of venom according to its effect viz. Hemotoxic, Cytotoxic & Neurotoxic.

- Haemo-toxic venoms are one which affects cardiovascular system.
- Cytotoxic venoms target specific cellular sites.
- Neuro-toxic venoms harm nervous system of human body.

“Enzymes present in snake venom hydrolyze protein and membrane components which lead to tissue necrosis and blood clotting” [10].

“Anti-venom is the only available treatment against snake bite, with first anti venom developed by Alberte Calmette against the Indian cobra (*NajaNaja*). Anti-venom is made by immunizing mammals such as horse, goat, rabbit with particular snake venom and the specific immunoglobins are isolated from the blood. The subject animal will undergo an immune response to the venom, producing antibodies against the venom's active molecule which can then be harvested from the animal's blood and used to treat envenomation. Anti venom is classified into two types. Monovalent anti snake venom when they are effective against a given species. Polyvalent anti snake venom when they are effective against a range of species” [10].

The cost effectiveness of the treatment is also a factor to be considered as the approx. cost of 1 vial anti snake venom which is nearing 300-500 INR and sometimes in thousands, hence the decision to choose between low dose regimen or high dose regimen depends upon patients financial condition rather than clinical condition. All patients with clinical manifestations or laboratory abnormalities, or both, because of snakebites ought to receive the antivenom as soon as possible, but many of them receive the antivenom too late [13].

Ricky Lee Langley et al concluded that although rare, venomous bites and stings during pregnancy may have a significant adverse effect on the fetus as well as the mother.

Anuradhani Kasturiratne et al. concluded Snakebites cause considerable morbidity and mortality worldwide with The highest burden existing in South Asia, Southeast Asia, and sub-Saharan Africa.

Chippaux et al. showed that snake-bites remained a public health problem in most countries, & actual numbers are difficult to be measured. The global figures were greatly underestimated. The true incidence of and mortality from snake envenomation exceeded 5 million per year, with an associated mortality level of 125000 persons per year. About 2.5 million people were envenomed each year, half of whom requested medical care, and probably more than 100000 individuals suffered from severe sequelae. The global disparity in the epidemiological data for snake-bites reflected the variation of health reporting accuracy and the great diversity of ecological and economic conditions throughout the world. Agricultural activities were associated with most of the bites. The snake species involved can be very dangerous because of the toxicity of their venom or abundance in areas close to human settlements.

Austin Gideon Adobasom-Anane et al showed that most of the snakebite victims were discharged as cured, but may have suffered some form of complication from the envenomation. It was also possible that the number of cases that were discharged against medical advice may have also died due to the poor prognosis of the cases leading to an increased number of deaths from snake bites. Delayed initiation of treatment for snakebite leads to less favorable outcomes for the victims involved.

4. CONCLUSION

Neurotoxic snake bite presented with neuropathic symptoms and systemic envenomation can be a treating dilemma for any treating physician. Role of anti snake venom in pregnancy and whether to use Anti Snake venom in pregnancy can be an ethical question as absence of proper clinical guidelines and scarcity of relevant research sources leaves chunk of treatment on clinical knowledge and expertise of treating physician. Outcome may depend on the degree of envenomation, gestational age at presentation, timing, duration and quality of treatment along with the clinical

sense and justification of empirical treatment given.

The current study highlighted that there is a significant decrease in morbidity and mortality of pregnant female having snake bites in terminal pregnancy i.e., third trimester, who are getting treatment from anti snake venom either low or high dose on early presentation to the health facilities. Moreover, no significant changes were seen in outcome of fetal health, although some cases reported increase in fetal mortality and morbidity which can be more due to other maternal and fetal health issues.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Kasturiratne A, Wickremasinghe AR, De Silva N, et al. The global burden of snakebite: A literature analysis and modelling based on regional estimates of envenoming and deaths. *PLOS Med*. 2008;5:1591-1604.
2. Chippaux JP. Snake-bites: Appraisal of the global situation. *Bull World Health Org*. 1998;176:515-524.
3. Jarwani B, Jadav P, Madaiya M. Demographic, epidemiologic and clinical profile of snake bite cases, presented to Emergency Medicine department, Ahmedabad, Gujarat. *J Emerg Trauma Shock*. 2013;6:199-202.
4. Sakthivel Vaiyapuri, Rajendran Vaiyapuri, Rajesh Ashokan, Karthikeyan Ramasamy, Kameshwaran Nattamaisundar, Anburaj Jeyaraj, Viswanathan Chandran, Prabu Gajjeraman, Fazil Baksh M, Jonathan M, Gibbins E, Gail Hutchinson. Snakebite and

- Its socio-economic impact on the rural population of Tamil Nadu, India.
Available:<https://doi.org/10.1371/journal.pone.0080090>
5. Austin Gideon Adobasom-Anane. Retrospective study of snakebite cases at the tamale teaching hospital.
Available:<http://hdl.handle.net/123456789/-1751>
 6. Ndu IK, Edelu BO, Ekwochi U. Snakebites in a Nigerian children Population: A 5-year review. *Sahel Med J.* 2018;21:204-7.
 7. Descriptive analysis of snake bite surveillance data in North Bank West Region. *The Gambia*; 2017-2021.
Available:<https://doi.org/10.21203/rs.3.rs-1812925/v1>
 8. Langley RL. Snakebite during pregnancy: A literature review, *Wilderness Environ. Med.* 2010;21:54-60.
Available:<http://dx.doi.org/10.1016/j.wem.2009.12.025>
 9. Gutiérrez JM, Calvete JJ, Habib AG, Harrison RA, Williams DJ, Warrell DA. Snake bite envenoming.
DOI:10.1038/nrdp.2017.63
 10. Jin H, Varner J. Integrins: Roles in cancer development and as treatment targets. *Br J Cancer.* 2004;90(3):561-65.
DOI:10.1038/sj.bjc.6601576
 11. Kini RM. Excitement ahead: Structure, function and mechanism of snake venom phospholipaseA2enzymes. *Toxicon.* 2003; 42(8):827-40.
 12. Soares AM, Fontes MRM et al. Phospholipase A2 myotoxins from Bothrops snake venoms: Structure-function relationship. *Curr Org Chem.* 2004;8(17): 1677-90.
 13. A Ministry of Health, Information Systems for Notifiable Diseases - SINAN. Accidents by venomous animals. Brasília (DF): Ministry of Health; 2004.

© 2022 Sowmya et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/92589>