WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 10, Issue 6, 696-704. Review Article ISSN 2277– 7105

LOCAL COMPLICATIONS OF SNAKE BITE AND IT'S MANAGEMENT THROUGH *AYURVEDA* W. R.TO *VISHAUPADRAVA*: A REVIEW

Dr. Kalpana R. Chavhan*[1] and Dr. Dipti K. Bopate[2]

[1]Assistant Professor, Department of Agadtantra, Government Ayurveda College, Nagpur.

[2]PG Scholar, Department of Agadtantra, Government Ayurveda College, Nagpur.

Article Received on
07 April 2021,

Revised on 28 April 2021,
Accepted on 19 May 2021

DOI: 10.20959/wjpr20216-20566

***Corresponding Author**
Dr. Kalpana R. Chavhan
Assistant Professor,
Department of Agadtantra,
Government Ayurveda
College, Nagpur.

ABSTRACT

It is clear that in many regions of the world, snake-bite is an important medical emergency and cause of hospital admission. It results in the death or chronic disability of many active younger people, especially those involved in farming and plantation work. However, the true scale of mortality and acute and chronic morbidity from snake-bite remains uncertain because of inadequate reporting in almost every part of the region. Snake bite creates systemic as well as local complications on the body of a bitten person.The local complications at bite site may arise depends on a variety of factors such as the species of snake involved, the venom, the amount injected, location of injection, patient factors could also be important body size , distribution of venom, children, adult etc. Active management is helpful for the survival of the individual, but there are certain local complications like cellulites, numbness over the area, paralysis of the region, tissue damage and necrosis, infection, Chronic ulceration etc. at snake bite site. *Vagbhata* mentioned 16 *Vishaupadrava* and its management among which some local *Updrava* due to *Sarpadansha* are also described. This review includes an effort to focus on the bite site complications due to snake venom, it's modern science perspective and the measures of its treatment in *Ayurveda*.

KEYWORDS: Snake bite, Snake venom, Complications, *Vishupadrava*, *Sarpdansha.*

INTRODUCTION

There are about 236 species of snakes in India, most of which are nonpoisonous However, there are 13 known species that are poisonous, of these, four namely Common cobra,

Russell's, viper, saw-scaled viper and common Krait are highly venomous and believed to be responsible for most of the poisonous bites in India.[1] A snake bite is an injury caused by a bite from a snake, often resulting in puncture wounds infected by the animal's fangs and sometimes resulting in envenomation. A significant proportion of snake bites is said to be due to non- venomous snakes; the question of envenomation does not arise in such cases.[2] The physical appearance of snakes may differ, there is often no practical way to identify a species and professional medical attention should be sought. The risk of being bitten can be lowered with preventive measures, such as wearing protective footwear and avoiding areas known to be inhabited by dangerous snakes. The outcome of snake bites depends on numerous factors, including the species of snake, the area of the body bitten, and the amount injected, which in turns depends upon the age, size, sex, weather it had recently taken a prey the type of fang canalized or groove.[3] Feelings of terror and panic are common after a snakebite and can produce a characteristic set of symptoms mediated by the autonomic nervous system. Snakebiteis an important medical emergency and cause of hospital admission. It results in the death or chronic disability of However, the true scale of mortality and acute and chronic morbidity from snake-bite remains uncertain because of inadequate reporting in almost every part of the region. Venom is nothing but the toxic saliva secreted by modified parotid glands, and is clear, amber colored fluid when fresh.[4] A bite may also trigger an anaphylactic reaction, which is potentially fatal. First aid recommendations for bites depend on the snakes inhabiting the region, as effective treatments for bites inflicted by some species can be ineffective for others. Snake bite creates systemic as well as local complications on the body of a bitten person. The local complications at bite site may arise depend on a variety of factors such as the species of snake involved, the venom the amount injected.Active management is helpful for the survival of the individual, but there are certain local complications like cellulites, numbness over the area, paralysis of the region, tissue damage and necrosis, infection, Chronic ulceration etc. at snake bite site. *Agadtantra* is a branch of *Ayurveda* which deals with signs-symptoms and management of poisoning. Ancient *Ayurveda* text books having many references related to snake bite and its treatment aspect. *Ashtang Sangraha Uttartantra* includes the description of *Agadtantra*, explains the types of poisons, it's signs-symptoms and treatment of various poisonings. Even In ancient time the *Acharyas* were aware of the complications of various poisoning. *Ashtang Sangraha* also describes the complications of poisoning as 16 various *Visha-upadravas*. Along with systemic *vishaupadrava* and its management some local *updrava* due to *serpadansha* are also

described.[5] This review is an effort to focus on the bite site complications due to snake venom, it's modern science perspective and the measures of its treatment in *Ayurveda*.

AIMS AND OBJECTIVES

1. To study the local Complications of Snake Bite and its Management.
2. To study the *Vishupdrava* and management of snake bite through *Ayurveda*.

MATERIALS AND METHODS

1. Classical Textbook of *Ayurveda (Asthang Sangraha*).
2. Different reference book regarding Forensic Medicine and Toxicology were studied**.**
3. Various pre reviewed journals**,** Previous studies conducted on similar subject at different universities and another research Centre.

Signs and Symptoms

There is vast variation in symptoms between bites from different types of snakes. The degree of toxicity depends upon the size of the person bitten, the potency of the venom, the main toxic principles it contains, and the amount injected.[6] The most common symptoms of all snakebites are overwhelming fear. Fear and anxiety are very common and can lead to panic and trauma related to falls due to severe anxiety. Local Pain at the site of the bite, Local Swelling spreading proximally, Tenderness, Painful Swelling of regional lymph nodes draining bite site. Other signs include fang marks, persistent local bleeding, bruising, lymphangitis, inflammation. Systemic envenoming include nausea, Vomiting, malaise, Abdominal discomfort.[7]

In patients with 'dry Bites'. Symptoms like flushing, breathlessness, palpitations, and dizziness, tightness in the chest, sweating and acroparaesthesiae are common Dry snakebites, and those inflicted by a non-venomous species, can still cause severe injury.[8] A snakebite may become infected with the snake's saliva and fangs sometimes harboring pathogenic microbial organisms, including Clostridium tetani. Infection is often reported with viper bites whose fangs are capable of deep puncture wounds. Bites may cause anaphylaxis in certain people.

Local Features of Snake bite[9]

- Fang marks- the presence of two fang marks is an indication of snake bite.
- Local Pain & bleeding -Burning or throbbing pain may develop immediately after the bite and spread proximally up the bitten limb.

- Local Swelling & inflammation
- lymphangitis (raised red lines tracking up the bitten limb)&lymph node enlargement
- Blistering, local infection, abscess formation& Necrosis

COMPLICATIONS OF SNAKE BITE

What is complication?

A secondary disease or condition that develops in the course of a primary disease or condition and arises either as a result of it or from independent causes.

The complications that may arise depend on a variety of factors such as the species of snake involved, the venom – the amount injected, location of injection, patient factors could also be important (body size – distribution of venom, children, adult). Snake bite creates systemic as well as local complications on the body of a bitten person. The complications of venomous snake bites can range from mild to severe. Complications include intense local pain and swelling ecchymosis and oozing at the bite site.[10] vision damage (from sprays especially), intracompartmental syndrome (localized severe swelling that can damage or destroy nerves and blood vessels, leading to muscle necrosis)[11] infection, limb loss, gangrene, sepsis, internal bleeding, cardiac damage, respiratory compromise, and even death. However, the ranges of possible complications that I could find are listed below, and these can be put into the following categories already known;

- **Neurotoxins** – numbness over the area, paralysis of the region could also result. This targets NMJ/synapses and can be classified as pre and post synaptic toxins (ANS). It includes ptosis, Dysarthria, muscular weakness, Paralysis.[12]
- **Myotoxins**– this involves destruction of skeletal muscle cells, resulting in muscle tenderness. Generalised muscular pain and stiffness.[13]
- **Haematoxins** – this affects blood clotting, some venoms possess anticoagulant activity, and promote excessive bleeding (cerebral haemorrhages can be very fatal – 20% of people who die after a snake bite have cerebral haemorrhages), while other toxins are procoagulant – initially causing wide spread clot formation, followed by defibronigenation, making patients more vulnerable to strokes (etc).
- **Nephrotoxins** –Renal failure is secondary to ischemia in Viper Bites [14]
- **Cardiotoxins --**Local tissue damage and necrosis may result in scarring and cosmetic effects, Chronic ulceration at snake bite site, infection Myocardial damage, Arrythmias, bradycardia tachycardia or hypotension Hyperkalaemia – where there is an excess of

serum potassium levels, Hypocalcaemia – lower calcium levels in blood serum, this and the above could be associated with the effect of toxins on neurons.[15]

Treatment of the bitten part

Immobilization:- Activity increases the spread of venom. Besides reducing the spread of venom, immobilization ceases the pain of snake bite.

Tourniquet:- Application of tourniquet is possible only when the bite is on a limb. It should be applied approximately 5 cm proximal to the bite.

Cleaning the wound:- The wound should be cleaned with plain water or saline.

Incision and Suction:- Free incision of the wound through fang marks and thorough sucking either with breast pump or mouth.[16]

Bacterial infections

Infection at the time of the bite with organisms from the snake's venom and buccal cavity is a problem with some species such as the Malayan pitviper, but prophylactic antibiotics were not effective Interference with the wound (incisions made with an unsterilized razorblade/knife) creates a risk of secondary bacterial infection following improper unclean wound incisions may require broad spectrum antibiotic therapy.[17] Later infections include nosocomial pneumonias and urinary tract infections.

Compartmental syndrome

Compartment syndrome results when increased pressure within limited space compromises the circulation and function of affected tissue. The failure to promptly identify and treat compartment syndrome leads to tissue necrosis, permanent functional impairment. Disability resulting from compartment syndrome is significant.[18]

Clinical features: Disproportionately severe pain, Weakness of intracompartmental muscles. Pain on passive stretching of intra compartmental muscles, Hypoaesthesia of areas of skin supplied by nerves running through the compartment.[19]

Fasciotomy in snake-bitten limbs

1. Fasciotomy is indicated when intracompartmental pressure rises within 20 to 30 mm Hg of systemic diastolic pressure. Pressures in Compartment syndrome typically exhibit 40 to 60 mmHg.[20]
2. Clinical evidence of an inter compartmental syndrome.

3. Hemostatic abnormalities have been corrected (antivenom with or without clotting factors).
4. In patients with severe local envenoming, the limb should be maintained in a functional position. For example, in the leg, equines deformity of the ankle should be prevented by application of a back slab.Functional effects of local envenoming range from persistent stiffnessand induration due to sclerosis of veins, lymphatics and tissue planes through which the venom has spread, to severe deformity, tissue loss, especially dermonecrotic, and requiring skin grafting and gangrene requiring debridement and amputation. Restoration of normal function in the bitten part should be started by simple exercises while the patient is still inhospital. After the patient has been discharged from hospital rehabilitation is rarely supervised but relatives can be instructed and given a time table of rehabilitation activities. Conventional physiotherapy may accelerate functional recovery of the bitten limb.

Local Complications Related to Bite Site According to *Ayurveda*

Vaghbhata mentioned 16*vishupdrava* i.e. complications of poisoning in *Asthangsanghraha Uttarasthan* Ch.47. According to him in the treatment of poisoning cases it is very important to remove the residual poison from the body by the use of drugs, by sight and sound. Even slight remanent of poison causes either disease of death.

Vagbhat mentioned systemic as well as local complications of poisoning. *Javar, Kaas, Vamana, Shawasa, Hikka, Atitrushna, Murchha, Atisara, Malawarodha, Anaha, Bastipeeda, Sheershool, Shotha, Raktstrava, Vishvaat, necrosis* these are 16 *Vishupadrava* along with these symptoms *vagbhata* also described the specific treatment for each *upadrava.* Even he stated that by ignoring these complications the person suffering from poisoning will die soon. By saying this *Vagbhata* quoted that treatment of complications of poisoning is equally important to that of specific treatment of poisoning.

Local complications mentioned by *vagbhata*

Shotha-Swelling of the bitten part

Putidansha-Necrosis of bitten part

Raktastrava-Bleeding from bitten part

Treatment of Complications

Shotha-Swelling of the bitten part	• *Vaman+Virechana* • *Sunthi+Pippali+Kutaki+DevadaruSiddaDugadhapaan* • *Tilasimulakalka+Pippali siddha* goat milk • *Nishotha+Trifalakwatha bhavana*(3day) [21] Give it to patient with Ghrita • *Lepaa--Honey+Vidanga+Trifala+Trikatu+Devadaru+Kasha+ Padmakhaka* *Madhur +Kashaya dravyalepaa*[22] • *Dhoopan-* *Shirish pushpa+Sarpashir+Tagara+kutha+Ghrita*[23]
Putidansha-Necrosis of bitten part	• *Madhur+shital +SnigdhadravyaPrishek,Aalepan* • *Leepa/sheka-* *-Ksheeri-vrikshaKashaya+milk* • *-Vatashrunga+Madhuk+Tila+Sarshapa+Saindhava+ Haritaki +Nimbapatra+Ghrita*[24]
Raktastrava-Bleeding from bitten part	• *Marich+GhritaPaan* *Tanduliyamula+sugar+Ghrita*[25] • *Leepa-Daruhaldilepan* *-Indravarunikalklepan* *Nasya-Sugar+Honey+goat milk* *-Ksheerkakolinasya*[26] • *In Krushavyakti-Snehana, Basti, Nasya, Pradhamana, Anjan karma*[27]

Agadpan-*Vagbhata* described few Agada for the removal of poison from body and to minimize the complications due to that.[28]

- *Kasharagada*
- *Sugandhyakhya agada*
- *Mahasugandhi Agada*

DISCUSSION AND CONCLUSION

Snake bite is a medical emergency can be dead if not treated quickly. A Common sign of a Bite from a venomous snake is the presence of two puncture wound from the animal fangs. Fear following a Bite is Common. Sometimes Venom injection from the bite may occur. The right antivenom can save a person's life. The treatment of Snake bite andits complications is very important. Swelling, excessive bleeding, Necrosis these are serious local complications that the bitten person can suffer. Sometimes Bites may result loss of limb or other Chronic problems. The outcome depends on the type of snake, the area of the body bitten, the amount of venom injected and the general health of the person bitten. Problems are often severe in children than in adults. Prevention of snake bites can involve wearing protective footwear,

avoiding areas where snakes live. Modern medical science follows many drugs and line of treatments for treating those complications. Antivenom is effective at preventing death from bites however, antivenoms frequently have side effects. *Ayurveda* also describes management of snake bite poisoning and complications of poisoning as *Vishupdrava* and it includes the local complications as *Putidansha, Shotha, Raktastrava*. Along with that *Ayurveda* mentioned the line of treatment for these specific local complications in form of *lepan, Dhoopan, Abhyantersevaniyadravya and Agadapaan*.

REFERENCES

1. Mohan G, Singh A, Singh T. Guidelines for the Management of Snake Bites. Curr Trends Treat, 2018; 2(2): 102- 108.
2. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; 981.
3. BV Subrahmanyam, Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, 8th edition, CBS Publishers, Chapter 45; 599.
4. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; 979.
5. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 2, Varanasi: ChaukhambaKrushnadas Academy, 2011; 380.
6. BV Subrahmanyam, Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, 8th edition, CBS Publishers, Chapter 45; 599.
7. Mohan G, Singh A, Singh T. Guidelines for the Management of Snake Bites. Curr Trends Treat, 2018; 2(2): 102-108.
8. SR Mehta, VSM & VK Sashindran. Clinical Features and Management of Snake Bite. Medical Journal Armed Forces of India, 2002; 58(3): 247-249.
9. SR Mehta, VSM & VK Sashindran. Clinical Features and Management of Snake Bite. Medical Journal Armed Forces of India, 2002; 58(3): 247-249.
10. BV Subrahmanyam, Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, 8th edition, CBS Publishers, Chapter 45; page 600.
11. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; 992.
12. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; 984.

13. BV Subrahmanyam, Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, 8th edition, CBS Publishers, Chapter 45; 600.
14. SR Mehta, VSM & VK Sashindran. Clinical Features and Management of Snake Bite. Medical Journal Armed Forces of India, 2002; 58(3): 247-249.
15. SR Mehta, VSM & VK Sashindran. Clinical Features and Management of Snake Bite. Medical Journal Armed Forces of India, 2002; 58(3): 247-249.
16. BV Subrahmanyam, Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, 8th edition, CBS Publishers, Chapter 45; 602.
17. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; Page 992.
18. Mark W. Bowyer. Lower Extremity Fasciotomy: Indications and Technique. Curr Trauma Rep., 2015; 1: 35-44.
19. VV Pillay, Comprehensive Medical Toxicology, Paras Medical Publisher, 2nd edition, Chapter 20; 992.
20. Vlad Adrian Alexandrescu, Didier Van Espen. Threatening Inferior Limb Ischemia: When to Consider Fasciotomy and What Principles to Apply?Hindawi Publishing Corporation ISRN Vascular Medicine, 2014; 1-9.
21. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 23, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
22. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 25, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
23. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 26, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
24. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 27, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
25. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 29, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
26. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 30, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
27. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Verse 31, Varanasi: ChaukhambaKrushnadas Academy, 2011; 382.
28. KavirajAtridev Gupta, Editor (Reprinted ed.). AsthangSangraha, Uttarsthan; Chapter 47, Varanasi: ChaukhambaKrushnadas Academy, 2011; 383.