



Concept Note

Snake venom – From a deadly poison to a life-saving remedy

Dilip K. Goswami

Department of Agada Tantra and Vidhi Ayurveda, Govt. Ayurvedic College, Guwahati-781014, Assam, India

E-mail: drdilipgoswami37@gmail.com; Phone: +91-9864351115

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ABSTRACT

Snake is considered and proved to be the most potently poisonous reptile. It is evidenced that venom of some snakes can cause the death of an individual immediately, even without giving time to utter a word. In modern toxicology, extensive study is being continued on snake venom to know it properly with special reference to its composition, property, mode of action, agents that can neutralize its effect and many secrets are invented by till now. In Indian mythology, there are many stories about snakes. Indians imagine a goddess as the mother of the snakes and the snakes are mentioned to have immense power and strength even to hold the earth. Several snakes like Basuki and Takshaka are mentioned as divine snakes and their anger is said to be of destructive power. Ayurveda, the well-accepted ancient health science, has also discussed the snake venom in detail and many interesting facts about it are also mentioned in the classics. Classification of snakes, the character of each of them, their behaviour, the effect of bite, preventive measures of snakebite, diagnosis, mode of action of snake venom, treatment etc. are the beauty of the Ayurvedic classics. Interestingly, Ayurvedic classics describe the use of snake venom for the treatment of some critical diseases which can be considered as a unique concept. A discussion on the use of snake venom as medicine is considered to be important and beneficial. It is expected that the information provided in this article will be able to inspire the researchers to explore new things in the field of not only toxicology but also medical care of some serious and incurable diseases.

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INTRODUCTION

Human society accepts the snakes as the strongest and potent animate. It is a popular belief that, snake bite occurs due to bad luck and almost all snake bites are fatal. The Ayurvedic classics describe the snake venom (Sarpabisha) as dangerous as thunder. Though most of the snakes are non-poisonous then also in the majority of incidences of snakebite death becomes the result.

A detail description of the snakes is available in the modern toxicology. Ayurvedic classics describe snakes with top priority with special reference to their number, type, morphology, behaviour, causes of bite, signs and symptoms of snakebite, complications and treatment with some specific medicines.

An interesting fact of the Ayurvedic classics can be considered as the description of “medicinal use of snake venom”. A unique description on collection, indication and necessary precautions necessary at the time of use of snake venom is attractive and praisable.

Throwing light on the medicinal use of snake venom to explore the scientific value can be considered to be the demand of the time. The present report described detail information about both toxic and medicinal effects of snake venom as mentioned in the Ayurvedic classics. Selected findings from the scientific literature are also included for appraisal of the modern scientific society. The Ayurvedic classics especially, Charaka Samhita, Susruta Samhita, Ashtanga Sangraha and Ashtanga Hridaya were studied to collect information on the snake venom with special reference to its harmful and medicinal effects.

AYURVEDIC ASPECT OF THE SNAKE VENOM

The snakes are considered as creatures with immense strength and potency. It is said that there are some snakes like Vasuki and Takshaka are holding the earth. They are so strong that if become angry, they can destroy the creation within a moment (Shastri, 1987). Indicating the potency of snake venom, the advice is given to the physicians

(Bishavaidya-Toxicologist) to treat the patient of snakebite without any delay because snake venom can cause the death of the patient within a moment (Gupta, 2005).

Snake venom is advised to use as medicine in some serious and incurable state of udara roga/tridosaja udararoga (gastrointestinal problems). It is advised that in such situations when all the treatments fail, the physician should explain to the relatives and friends of the patient about the failure of previous treatments and prognosis. It is also to be explained that the patient will surely die if the treatment will not be given. After getting consent, the poison should be given to the patient with food or drink.

It is said that the poison should be collected from an angry snake by allowing it to bite the fruit. This poisoned fruit should be eaten by the patient. This poison, with its strong excretory property, can expel out the vitiated Dosha from the system and the patient may recover (Sastri, 1987). It is advised that in dushibishaja udara roga (some gastrointestinal manifestations occurring due to slow poisoning prepared by mixing some poisonous/ non-poisonous substances) the patient should be given sugarcane plant or fruit bitten by a black cobra (Krishnasarpa). Since this condition is incurable, so snake venom is advised to apply as the ultimate choice (Shastri, 1987).

MODERN ASPECT AND RECOMMENDATION

Various scientific studies confirmed that the snake venom has the ability to treat serious and life-threatening diseases including cancers, diabetes and hypertension. The toxic venom can change harmful proteins to harmless proteins within the body of snakes and this reversal of function has been considered as an idea to discover the drugs against various chronic diseases (Gul et al, 2015). Many snake venom toxins target the same physiological pathways that doctors would like to target to treat a variety of medical conditions. The disintegrin eristostatin from the venom of the Asian Sand-Viper was found active against melanoma and other cancers (Hailey et al., 2013). Various constituents like phospholipase type A2, myotoxin, purine and pyrimidine have been identified from different snake venom which showed anticancer, anti-hypertensive and analgesic activities. On the other hand, these venoms have a high level of toxicity including destroying muscle cells, degeneration of synaptic nerve, respiratory arrest, convulsions, RBC destruction, attacks the circulatory system, blood clotting mechanism disturbance due to blood poisoning (Gul et al, 2015).

The description of snake and snake venom as having the capacity to cause immediate destruction of the creation is appreciable. From the different studies, modern toxicology also agrees about the immediate fatality of snake venom. About the strength and beneficial effects of the snakes, it is to

be admitted that, the description of the Ayurvedic classics are praisable. It is also to be mentioned that the snakes have a contribution to the maintenance of ecological balance. Hence, human society should respect them and should not cause harm to them without any cause. The snakes should be preserved and no cruelty should be shown towards them. Saying that, some of the snakes like Vasuki and Takshaka are holding the earth by their strength is also indicating the importance of the snakes for human society.

Concerning the fatal effect of snake venom, it is nicely expressed that a toxicologist should never make delay in treating a patient of snakebite as this venom can cause the death of the person even within a moment. This fact is also admitted by modern toxicology. A good number of snakes are identified until now that can cause the immediate death of the victim even not giving time to think about treatment.

The advice on the use of snake venom for treatment is very interesting. Naturally, snake venom is very strong and fatal. Hence, it should never be used in mild diseases. However, when all the treatments fail to give recovery, then the use of snake venom should be considered. It can dilute and scrape the vitiated dosha (body humour) accumulated in the different parts of the body. So, it is assumed that the use of the venom may clean the obstructed dirty channels (Srotas) of the body and expel out the accumulated disease-causing elements which can cure the patient. On this concept, more scope of scientific study is there.

The method of collection of snake venom mentioned in Ayurvedic classics is also interesting. Fruit or sugarcane plant bitten by an angry snake is advised to use. Though the procedure of collection is not detailed enough, it can be assumed that in the process, a poisonous snake (generally black cobra) is to be taken into control and kept in such a manner that it will not be able to bite the person. One person has to make the snake angry and fruit or sugarcane plant should be kept in such a manner that when the snake will become angry it will bite it. In each bite, the snake will inject venom into the fruit or the sugarcane plant. This process should be repeated and as much of venom should be collected in the fruit or sugarcane plant, the process has risk. On the other hand, in each case, fresh venom is to be collected which is not easy. This concept also needs more study.

The precaution for application of snake venom mentioned is interesting. The scholars are fully aware of the harmful effect of the snake venom going to be given to the patient. It may cause the death of the patient instead of a cure. Hence, it is advised that before the administration of the poison, the whole thing about the poison including the chance of death should be explained and after getting the consent only it should be used. It indicates the knowledge of the Ayurvedic scholars about informed consent.

CONCLUSION

The contribution of the snakes in the maintenance of ecological balance was well studied by the ancient Indian sages viz. Charaka, Susruta and Bagbhata (before approximately 5000 years of Christ). To make the society aware of the need for preservation of the snakes, they were described as the weight bearer of the earth. There were study and experience on the harmful effect of the snake venom. It was well known that snake venom is of such high potency that it can end the life of an individual even within a moment. Therefore, the toxicologists are warned and advised that in snakebite, there should be no delay in the treatment.

The study and concept of collection and use of snake venom witness the depth of knowledge of the Ayurvedic scholars. The advice to take the informed consent from the legal guardians including the administration is astonishing and praisable. It can be said that there should be an extensive study of the Ayurvedic classics to explore the knowledge. All the facts mentioned in the classics should be evaluated scientifically with multi-disciplinary effort for the benefit of human society.

CONFLICT OF INTEREST

The author declares no conflicts of interest.

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