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Research Article

SHATPADIDANSHA (CENTIPEDE BITE) AND ITS MANAGEMENT: OVERVIEW

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ABSTRACT

Centipede bite is referred as *Shatpadidansha*. *Shatpadi* is one of the oldest poisonous animals across the worldwide. *Ayurvedic* classics explain its types, bite effect & its management in very short. In Latin word centi means "hundred" and Pedis means foot. They are elongated metameric creatures with one pair of legs per body segment. Despite the name centipedes can have a varying number of legs ranging from 30 to 354. Centipedes always have an odd number of pairs of legs. Therefore there is no centipede with exactly 100 legs. It is more neglected concept in context to research so this topic was chosen & entitled as *Shatpadidansha* (centipede bite) and its management overview. It is conceptual type research so *Ayurvedic* texts as well as Non-*Ayurvedic* texts & various articles from journals are followed. The aim of this manuscript was to correlate the concept of centipede bite in context to *Shatpadidansha* as per *Ayurved*. All the references were composed, organised & considered to draw fruitful conclusion. Conclusion is *Shatpadidansha* can correlate with centipede bite.

Keywords: *Agadatantra*, *Shatpadidansha*, Centipede, Centipede bite, Poisoning, Management

INTRODUCTION

Danstraor Vishachikitsa (treatment) as the *Agadatantra* is popularly known deals with various methods of cleaning the poisons out of the body as well as recommends antidotes for particular poisons. It deals with the management of poisoning, resulting from the bites of snakes, insects & worms, spiders, rodents etc. & various other poisons produced by improper combinations of substances or drugs¹.

The substance which causes fear and grief is called as *Visha*². There are two types of Poisons (*Visha*) that have been described in the *Agadatantra*. The poisons are classified as *Sthavara* and *Jangama*. *Sthavara* comprise of poisons that have plant origin and toxic minerals, metals or metal ores that are found inside the earth. *Jangama* consist of the venoms of animals like snakes, scorpions, worms, insect's etc³. as described in definition of *Agadatantra* first preference is given to animal poisoning. In ancient time more number of people were affected by animal and insects as they were wandering the forest for their daily routine. Various types of animal bites are described in *Ayurveda*. Description about snake bite, scorpion bite, spider bite, dog bite are usually seen in our textbook & more focused on it. This may be due to their toxicity fatal for human being. But unfortunately less

importance has been given to other insects & arthropods bite. *Shatpadi Dansha* (sting) is one of them. *Shatpadi* are known as centipedes. The centipedes are known by various names in India. Kankhujra in Uttarpradesh, Kansla in Rajasthan, Kankol in Punjab, Kansui in Maharashtra, Kennri in Orissa, Kenno in Bengal. All of them begin with *kan* which in Hindi means ears. But this is not true at all. The fact is that it is a nocturnal arthropod having photonegative behavior that hides in dark places. Centipedes are fast moving, carnivorous, venomous invertebrates. Centipedes are arthropods belonging to the class Chilopoda of the subphylum Myriapoda & are organic animal irritants⁴.

There are so many research paper published in different international & national platform in context to toxicity of snake bite, dog bite. But there are very few papers are found regarding the centipedes & as per author's information & data found on different websites almost no research paper is seen about *Shatpadi*. The toxicity of centipedes is not usually fatal but the pain is moribund. By knowing the importance of this unique concept study was selected which was conceptual in nature. This study was little effort to explain & highlight the centipede bite in *Ayurvedic* Perspective literary. By this study now we can explain the centipede bite as *Shatpadidansha* in terms of *Ayurveda*.

AIM & OBJECTIVES:

- To study the concept of centipede bite and its management as per modern science.
- To study the concept of *Shatpadidansa* and its treatment according to *Ayurveda*
- To correlate the concept of centipede bite in context to *Shatpadidansa* as per *Ayurved*.

MATERIALS AND METHODS

Textual materials are used for various references in this study. *Ayurvedic* texts followed are *Charaka Samhita*, *Sushruta Samhita*, *Astanga Sangraha*. Non-*Ayurvedic* texts include books of forensic medicine & toxicology as well as various article from journals. All the references were collected, structured & deliberated to drawn prolific conclusion.

TYPE OF STUDY:

Conceptual Study.

REVIEW OF LITERATURE:**Modern review of centipedes, centipede bite and treatment:**

Centipedes are a varied group composed five orders. Scutigermorpha, Lithobiomorpha, Craterostigmomorpha, Scolopendromorpha & Geophilomorpha. There are more than 20 families approximately 3000 species of centipedes⁵.

Scutigermorpha: These are all fast moving species having 15 pairs of long legs & spiracles on the first 7 segments only. This is the only group of centipedes which have compound eyes all the others have either simple eyes or none at all. They are above ground predators. Scutigeralongicornis from India about 5-7cm long is one of the largest species known. Like scolopendris, they can autotomize their legs when under danger from predators. In some cases these legs remain to stridulate disturbing the predator from the whole animal.

Lithobiomorpha: The glistening brown centipedes that scamper away when stones & woods are turned belong to the group known as lithobiids or stone occupants. This relatively populargroup of medium sized to small centipedes is found commonly in temperate & hot areas. They have 20-50 antenatal segments, 15 pairs of legs & only 6 or 7 pairs of spiracles. Female lithobiids can be notable from males fair easily by their much larger, claw like gonopods protruding from the body between the last legs.

Craterostigmomorpha: There is only one genus in this order that occurs only in Australia & appears to represent a halfway stage between the Scolopendrids & the Lithobiids. They have 15 pairs of legs & only 7 sets of spiracles.

Scolopendromorpha: This is large order. All of them have 21 pairs of legs & 17-30 antennal segments. One of the species scolopendra gigantean can be over 30 cm in length. Many of the larger Scolopendrids are colorful & venomous. Some of them are dangerous. The largest Indian centipede scolopendra hardwickei is easily recognizable by its alternate colored bands on tarsal segments & is common in Deccan & the Andamans. The terminal legs are often modified. Some species autotomize some of their legs are often reformed. Some species autotomize some of their legs to distract potential predators. The order as a whole is more frequent in the tropics than in temperate regions.

Geophilomorpha: The cenipedes most likely found living in the soil are relatively long & slim are known as geophilids which means ground lover. These are long worm like species adapted to burrowing in the soil. They have 31 to 177 pairs of legs, 14 segments in the antennae & spiracle on every segment except the first & last one. Some species such as the North American *Oryabarbatica* may reach 15-17 cm in length. However most species are smaller such as the European *Haplophilus subterraneus* which is about 30.5 cm long. Centipedes have a wide geographical variety where they even reach beyond the freezing circle. Within these environments centipedes require a moist micro-habitat because they lack the waxy cuticle of insects and arachnids and so lose water briskly through the skin.

The body sections are flattened & some or all of them bear spiracles for breathing. Centipedes generally have a single claw at the end of each leg, which they walk or run on except the fast moving scutigera. They are plantigrade. The appendages of the first body segment have been modified to form large, poisonous fangs that are used to capture living preys during active predation & contain venom glands. Three pairs of modified appendages which compose the mouth parts include the most important appendage known as venom claw or jaw. A neurotoxic venom is injected through venom duct.⁶

The venom distribution apparatus consists of a modified pair of front legs (i.e. forcipules) just behind the mandibles. Venom is produced in a gland at the base of forcipules & is injected through ducts when the forcipules are driven into the victim's tissues. The venom of the North American giant desert centipede, scolopendraheros contains cytolysin. In addition to venom some species exude defensive substances from glands found along the body segments. These secretions are usually nontoxic to humans, although at least one species of the genus *Otostigmus* secretes a vesicating substance. Some centipedes secrete phenol, quinone, and cyanogen from the base of their feet which may produce ulcer.⁷ despite the fact that no centipede shows real danger for human beings the bite of large centipede such as *Scolopendra* can be painful to an adult & dangerous to a small child. Centipedes mainly use their antennae to seek out their prey. The digestive tract forms a simple tube, with digestive glands attached to the mouthparts. Like insects, centipedes breathe through a tracheal system typically with a single opening or spiracle on each body segment. They excrete waste through a single pair of malphigian tubules. All centipedes are principally nocturnal & are shy of light though some species of scutigermorpha are seen actively at times in daytime as well. Centipedes eats insects, earthworms, spiders, slugs & other small animals. The largest centipede, scolopendragig as eats rats & some small lizards.

Life cycle of centipedes

Centipede reproduction does not involve copulation. Males deposit a spermatophore for the female to take up. In one clade this spermatophore is dropped in a net and the male commences a courtship dance to encourage the female to consume his sperm. In other cases, the males just leave them for the females to find. In temperate areas egg laying take place in spring and summer but in subtropical and tropical areas there appears to be little seasonality to centipede

breeding. There are a few known species of parthenogenic centipedes.

The Lithobiomorpha, and Scutigermorpha lay their eggs singly in holes in the soil, the female fills the holes with soil and leaves them. The number of eggs placed ranges from about 10 to 50. Time of development of the embryo to hatching is decidedly changeable and may take from one to a few months. Time of development to reproductive period is highly variable within and among species. The young usually hatch with only 7 pairs of legs & gain the rest in consecutive sheds. Each time a centipede sheds, it gains new body segments & legs. Scutigera coleoptrata the American house centipede hatches with only 4 pairs of legs & in successive sheds has 5, 7, 9, 11, and 15 before becoming a sexually mature adult. It takes about 3 years for *S. coleoptrata* to achieve adulthood.

Females of Geophilomorpha and Scolopendromorpha show far more parental care. They lay eggs 15 to 60 in number, are laid in a nest in the soil or in rotten wood. The female stays with the eggs, protecting and thrashing them to defend them from fungi. The female in some species stays with the young after they have hatched, protecting them until they are ready to leave. If disturbed the female will either abandon the eggs or eat them, abandoned eggs tend to fall prey to fungi rapidly.⁸ Some species of Scolopendromorpha are matrophagic, meaning that the offspring eat their mother.

Centipede Bite

Even nonvenomous centipedes are considered terrifying by humans due to their dozens of legs moving at the same time and their tendency to dart quickly out of the dusk towards one's feet. The commonest genus encountered in India is scolopendra. The fangs of Centipedes of the genus Scolopendra can penetrate human skin and deliver a venom that produces extreme burning pain, swelling, erythema, gangrene, lymphanginitis and lymphadenopathy with inflammation of skin & subcutaneous tissues, ulceration & also in most cases a localized necrosis takes place⁹. Some species of centipede can be harmful to humans because of their bite. Although a bite to an adult human is usually very painful and may cause severe swelling, chills, fever and weakness. It is unlikely to be fatal. Bites can be dangerous to small children and those with allergies to bee stings. The bite of larger centipedes can induce anaphylactic shock in such people. Smaller centipedes generally incapable to puncture human skin. The degree of symptoms varies from person to person and bite to bite. Pain and oedema generally resolve naturally over a few days to one week but can continue for up to three weeks. Cellulitis and secondary infection occur but are unusual complications of *S. subspinipes* bites have been reported with the Giant Desert Centipede¹⁰. Systemic reactions and death from centipede envenomation rarely occur. However acute myocardial ischemia in an adult male as well as death in a 7-year-old girl after a bite to the head have been reported.

Treatment

Many sufferers of centipede envenomation do not seek medical attention and most symptoms will resolve spontaneously. Management should be supportive with wound care and control of pain and inflammation being the

spine of treatment. Pain can be treated with application of icepack over the injured area. Severe pain may require injection of local anaesthetic. A tropical corticosteroids, antihistamine, local anaesthetic combination may be of value in controlling inflammation & itching.¹¹ Since no vaccine or antiserum against centipede venom is available, application of tincture iodine or rubbing in of the crystals of potassium permanganate or liquid ammonia after making a nick between the two punctures is helpful. In addition dressings with hydrogen peroxide if necessary is recommended. Prophylactic antibiotics are generally not beneficial. However if confirmation of secondary infection is present, the wound should be cultured and a course of antibiotics which cover gram positive organisms should be introduced. Benzodiazepines may be helpful in the centipede victim with symptoms of anxiety. Cardiac ischemia and anaphylaxis are very rare complications and managing these conditions with standard protocols takes priority over treating localized symptoms. All patients presenting with centipede bites should be monitored in the emergency room for at least 4 hours for evidence of toxic shock. In addition, bite victims should receive an immunization for tetanus (Anti tetanus serum).

AYURVEDIC REVIEW OF SHATPADI, SHATPADI BITE AND TREATMENT

Eight varieties of *shatpadi* are mentioned in *Susrutasamhita*. *Parusa*, *Krsna*, *Citra*, *Kapila*, *Pitika*, *Rakta*, *Sweta* and *Agniprabha*.

Signs & symptoms of *shatpadi* bite:

According to *Acharya Susruta* centipede bite causes pain, swelling & burning sensation in heart region. When bitten by *sweta* & *agniprabha* kinds there will be more of burning sensation, fainting & development of white coloured eruptions¹². According to the *Acharya Charaka* centipede causes sweating, piercing pain & swelling.¹³ Bite by *shatpadi* (centipede) produces yellowish discoloration of the bitten part, sweating, pain, redness & swelling or it may resemble the flowers of *atasi* (white in colour) surrounded with eruptions & may produce giddiness¹⁴.

Treatment

Kumkuma (Crocus Sativus), *tagara* (Valeriana Wallichii), *sigru* (Moringa Oleifera), *padmaka* (Prunus Puddum), the two *rajani* (Curcuma Longa and Berberis Aristata) these all are macerated in water & applied on the bitten part will destroy the poison of *satapadi*¹⁵. *Svarjika*, *ksara* (ash) of *ajasakrt* (excrements of goat), *yavaksara*, *surasa*, *aksipidaka* this taken with wine scum is beneficial in centipede poisoning¹⁶.

DISCUSSION

Centipedes, bees, wasps, scorpions and other biting arthropods cause human fatalities but these are not often characterised as attacks. It may be difficult to characterize some of these encounters as offensive or defensive. As per *Ayurveda* *Shatpadidansha* causes pain, swelling, redness locally & same description is found in the centipede bite i.e. extreme burning pain, swelling, erythema, gangrene, lymphanginitis and lymphadenopathy with inflammation of skin & subcutaneous tissues, ulceration. Systemically *Shatpadidansha* produces burning sensation in heart region, sweating, fainting &

centipede bite may produces systemic features like nervousness, faintness, vomiting, headache, convulsions, irregular pulse & cardiac arrhythmias, rhabdomyolysis & renal failure in rare cases. As per treatment is concerned *Ayurveda* described mainly local application. Contemporary science also mainly focused on local treatment and symptom wise management

CONCLUSION

From above discussion it is concluded that centipede bite symptoms resembles with *Shatpadidansha*. The symptoms which are described in *Shatpadidansha*s exactly correlate with centipede bite. The fatality in both cases is negligible which is seen in both compendia. As the fatality rate are negligible but one can't neglect the intense pain which is produced due toxic bite. The treatment modality defined in both sciences are in the form of local applications & symptomatic.

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