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Spiders are carnivorous anthropods that coexist with humans. Most of the anthropods transmit communicable diseases. Spiders rarely transmit communicable diseases, but they also play an important role in the ecosystem by consuming other anthropods, such as mosquitoes and flies which transmit diseases. There are more than 30,000 species of spiders and most of them are venomous. Spider bites also called as arachnidism, is an injury resulting by the bite of spider. The epidemiologic analysis of spider bites is confounded by several factors including the extensive differential diagnosis of dermal bite-like lesions, suspected versus definite spider bites and precise identification of spiders by arachnologists. Most of the spider bites are not of importance due to delicate mouthparts and short fangs resulting in lack of substantial envenomation. The differential diagnosis and treatment of spider bite is of vast importance as it includes other anthropod bites, skin infections and exposure to chemical or physical agents. *Agada Tantra* part of Ayurveda has different approach towards classification of spiders with its clinical features and treatment. In this article an attempt is made to conceptualize spider envenomation according to Ayurveda which will help not only for differential diagnosis of spider bites but also the easy availability of herbal medicine treatment. This article is also helpful in further study to integrate differential diagnosis and treatment approaches of Ayurveda in modern science with the help of phyto-chemical analysis.

**Keywords :** *Luta, Luta visha, Spider, Spider bites*

**INTRODUCTION:** There are more than 30,000 species of spiders and most of them are venomous <sup>[1]</sup>. The largest phylum in animal kingdom is Anthropoda, including more than a million insects classified, and half a million more insects yet to be classified <sup>[5]</sup>. Most of the anthropods are plant pollinators, but others such as flies, mosquito and ticks can transmit serious human diseases. There are approximately 200 species from 20 genera of spiders worldwide, which can cause severe human envenomation, with severe dermonecrosis, system toxicity and death <sup>[5]</sup>. In India approximately 59 different Family of spiders are found, which include more than approximately 600 different spiders <sup>[6]</sup>. The most venomous spider found in India

is the Fringed-Ornamental Tarantula which can cause excruciating pain, muscle cramps and leads to coma. The collective term arachnidism is often used to refer envenoming spider bites, arachnidism also includes bites by other arachnids, such as scorpions <sup>[7]</sup>. The preferred collective term for envenoming spider bite is araneism, with spider bites further classified by systemic manifestations such as necrotic araneism <sup>[5]</sup>. Necrotic araneism is characterized by dermonecrotic ulceration at spider bite due to combinations of cytotoxicity from venom components and autoimmune responses from lymphocytes and cytokinins <sup>[5]</sup>.

The differential diagnosis of spider bites is difficult due to many species in spider

family itself and due to vastness of kingdom anthropoda. Most of the cases are treated symptomatically and for few poisonous spiders the treatment protocol being standard with antivenom like *Loxosceles* antivenom, Sydney funnel-web antivenom and armed spider antivenom has helped to reduce pediatric mortality, but has improper results differentiating from one patient to other patient<sup>[5]</sup>. *Agada Tantra*(Toxicology) part of Ayurveda deals with the study of poisons, their actions, their detection and treatment<sup>[1]</sup>. It also deals with signs, symptoms and management of poisoning, resulting from the bites of snakes, insects and worms, spiders, rodents etc. and with various other poisons produced by improper combinations of substances or drugs<sup>[1]</sup>.

*Agada Tantra* has simplified approach towards *Luta*'s (spiders) and has included the classification, clinical features (general and specific) and its treatment (general and specific) protocol.

**MATERIALS AND METHODS:** The study on *Luta-Visha* (spider-poison) was done with the help of Ayurvedic Samhitas especially *Sushruta Samhita* to conceptualize and summarize the data of different samhita in this article. The MEDLINE research and some case-series were reviewed to study cases of spider envenomation

## RESULTS

### Classification of *Luta*:

1. Based on *Dosha* Vitiating: *Vaatika* or *Vayavya* (*vata* vitiating), *Paitika* or *Agneya* (*pitta* vitiating), *Sleshmika* or *Saumya* (*kapha* vitiating) and *Sannipatika* or *Mishrika* (vitiating of *vata*, *pitta* and *kapha* at the same time)<sup>[4]</sup>.

2. Based on *Vishaprabhava* (action of poison):

- *Tikshna Visha* (acutely and violently): Occurrence of death is within 7 days<sup>[4]</sup>.

- *Madhyama Visha* (moderate): Occurrence of death is within 7 to 10 days<sup>[4]</sup>.

- *Manda Visha* (mild): Occurrence of death is within 15 days<sup>[4]</sup>.

3. Based on site of poison in *Luta*: There are eight poisoning sites of spider. 1)*Shvas* (Breath), 2) *Danshtra* (Fangs), 3) *Purish* (Fecal matter), 4) *Mutra* (Urine), 5) *Shukra* (Semen), 6) *Lalastrava* (Saliva), 7) *Nakha* (Nails) and 8) *Artava* (Menstrual fluid)<sup>[4]</sup>.

4. Based on *Sadhyaa-asadhyata* (prognosis):

- *Krrucha-sadhyaa* (Hard to treat).
- *Asadhyaa* (Untreatable)<sup>[4]</sup>.

### Clinical Features:

1. General Features:

Generally the poisons of spiders have the properties of vitiating all the three doshas, but there is predominance of vitiating of *pitta* and *kapha dosha* respectively<sup>[2]</sup>. The general features of *Luta* bites are, appearance of a round shape with rash in white-black or red or yellow or bluish in color, soft elevated, its center is either black or blue and resembles as a net at its edges, spreading in nature like *visarpa* (erysipelas), swollen, with burning sensation and severe pain, fever, undergoes quick ulceration or suppuration, exudation, sloughing, destruction of muscles, causes the wound if exudation gets touched to the other healthy parts<sup>[3]</sup>.

2. Specific Features:

- a) **According to Dosha Vitation:**

- *Vatika* or *Vayavya Luta*: These are born from the soil and give rise to diseases of *vata*. It will show the features of swelling which is rough, blue in color,

giving rise to pain in joints and bodyache<sup>[4]</sup>.

- *Paitika or Agneya Luta*: These are born from sweat and give rise to diseases of pitta. It will show the features of burning sensation, thirst, and formation of blebs (vesicles), fever and burning sensation all over the body<sup>[4]</sup>.

- *Sleshmika or Saumya Luta*: These are born from eggs (ova) and give rise to diseases of kapha. It will show features of hard swelling, white in color, itching and mild pain<sup>[4]</sup>.

- *Sannipatika or Mishrika Luta*: These are also known as *Upadika luta*<sup>[3]</sup>. It causes vitiation of three *doshas*. The poison of these *luta* spread rapidly causing fire like burning sensation all over body and is present with all the poisoning symptoms of *Vatika*, *Paitika* and *Sleshmika*<sup>[4]</sup>. The symptoms arise as per predominance of the *Prakriti* of the patient<sup>[2]</sup>.

b) According to site of poison in *Luta*:

- **Breath**: Poisoning by breath the person quickly develops swelling associated with fever and burning sensation<sup>[4]</sup>.

- **Fangs**: The site has profound swelling associated with pricking pain and burning sensation<sup>[4]</sup>.

- **Excreta**: There is swelling with foul smell, burning sensation, itching, pricking sensation, it ripens quickly and when ripe it is yellowish<sup>[4]</sup>.

- **Urine**: The swelling has red colored edges and black center, resembles a whirl, emits foul smell, spreads outwards and has burning sensation<sup>[4]</sup>.

- **Semen**: The swelling resembles a tumor, is hard and very painful<sup>[4]</sup>.

- **Saliva**: The site has pain; elevated rash which is not deep seated has mild pain, itching and soft to touch<sup>[4]</sup>.

- **Nails**: The site has eruptions, burning sensation, itching and feels as though hot smoke is coming out<sup>[4]</sup>.

- **Menstrual Fluid**: Red colored eruption appears resembling garland<sup>[4]</sup>.

c) According to *Sadhy-a-asadhyata* (prognosis):

- *Kruchasadhya Luta*: The bite from these spiders results in aching pain in the head, pain and itching at the site of bite and symptoms peculiar to the aggravated *vata* and *kapha*<sup>[2]</sup>.

- *Asadhy-a Luta*: The bites from these spiders are marked by bleeding, fever, burning sensation, diarrhea, and disorders due to the concentrated action of all the three deranged *doshas* of the body and the bitten part putrifies<sup>[2]</sup>.

**Stages of Spider Envenomation:** Acharya Vaghata described different stages of spider envenomation in a day-wise pattern. He also mentioned that the lesion at the site of bite does not manifest for half a day from the time of bite<sup>[3]</sup>.

- **First Day**: It appears as though pricked by a needle, with no discoloration over the affected part; there will be slight itching and pain<sup>[3]</sup>.

- **Second Day**: The site of bite is of raised edges, surrounded by eruptions with well change in color of skin, depressed in center and has itching<sup>[3]</sup>.

- **Third Day**: The patient suffers with fever, horripilation, red circular patches at the site with the shape of a saucer, with severe agonizing pain and discharge from hair follicles<sup>[3]</sup>.

- **Fourth Day**: There is profound swelling causing fever, dyspnea and giddiness<sup>[3]</sup>.

- Fifth Day: It gives rise to symptoms of poisoning related to predominant dosha as per described in dosha vitiation<sup>[3]</sup>.
- Sixth Day: The poison invades all the vital organs<sup>[3]</sup>.
- Seventh Day: The poisoning results in death<sup>[3]</sup>.

**Treatment:** The treatment measures for Luta visha is as follows:

- *Nasya* (Snuffing)<sup>[4]</sup>: Nasal drops from herbs *Shyama* (*Ocimum tenuliforum*), *Yavaphala* (*Trachyspermum ammi*), seeds of *Phanijjaka* (*Hyocymus niger*), and *Shirisha* (*Albizia lebbeck*) macerated with the juice of *Vartaka* (*Solanum melongena*) is best to remove the poison. And it also may be useful when there is heaviness of head, swelling, salivation and lock jaw<sup>[2]</sup>.
- *Anjanam* (Medicated Collyrium)<sup>[4]</sup>: If disorders of vision, swelling and itching in the time are present at the time of onset of sleep, then the collyrium prepared from *Vacha* (*Acorus calamus*), *Trikatu* (*Zingiber officinale* + *Piper longum* + *Piper nigrum*), *Triphala* (*Emblica officinalis* + *Terminalia bellerica* + *Terminalia chebula*), *Lodhra* (*Symplocos racemosa*), *Tamra* (Copper), *Mukta* (Pearl) and *Pravala* (Coral)<sup>[2]</sup>.
- *Abhyanga* (Unguents)<sup>[4]</sup>: Medicated ghee prepared with roots of *Katabhi* (*Careya arborea*), *Tagara* (*Valeriana wallichii*), *Devadaru* (*Cedrus deodara*), *Brihati* (*Solanum indicum*) and *Chandana* (*Santalum album*)<sup>[2]</sup>.
- *Panam* (Potions)<sup>[4]</sup>: *Sarpakshi* (*Xanthium strumarium*), *Chandana* (*Santalum album*), *Gandhanakuli* (*Acampe praemorsa*), *Ela* (*Elletaria cardamomum* + *Amomum subulatum*) is made into paste

with Goats Urine is used for internal drink and external application<sup>[2]</sup>.

- *Dhupanam* (Fumigation)<sup>[4]</sup>: Fumigation is done by antipoisonous drugs<sup>[3]</sup>.

- *Gandusha* (Gargling)<sup>[4]</sup>: Gargling is done by antipoisonous drugs<sup>[3]</sup>.

- *Vamana* (Emesis<sup>[4]</sup>): The poison should be removed by administrating *Vamana* using *Koshataki* (*Luffa acutangula*), *Lodhra* (*Symplocos racemosa*), *Indrayava* (*Hollarrhena pubescens*), *Saindhava* (Sea salt), *Patola patra* (*Trichosanthes dioica*), *Maricha* (*Piper nigrum*) and *Priyangu* (*Callicarpa macrophylla*)<sup>[2]</sup>.

- *Virechana* (Purgation)<sup>[4]</sup>: Purgation can also be done by *Triphala* (*Emblica officinalis* + *Terminalia bellerica* + *Terminalia chebula*), *Trivrut* (*Operculina turpethum*) and *Saindhava* (Sea salt)<sup>[2]</sup>.

- *Raktamokshana* (Blood-letting)<sup>[4]</sup>: Blood should be taken out from other parts of the body by cutting the vein. After blood letting it is beneficial to pour cold ghee, milk etc. on the body<sup>[2]</sup>.

**DISCUSSION:** As per the classification of *luta*, it is clearly understandable that Acharya's have given more focus on *Dosha* Vitation, due to which the *lutas* are divided only in four groups. These four groups have varying symptoms which help in proper differential diagnosis and thereby helping treatment. Acharya's have described the severity of prognosis for spider envenomation on the basis of *Dosha* Vitation and kept a simple approach, that the poison which vitiates more number of *doshas* the prognosis is bad. Acharya Vaghbata had described the stages of Spider envenomation in human beings which denotes the severity of poisoning increases with days and also gives a rough

idea of the severity of poison on a particular day. This helps in following the severity of treatment protocols. Acharya's have mentioned the treatment protocols to reduce the *dosha* aggravation thus resulting in better prognosis. *Nasya* and *Abhyanga* is done to decrease *Vata* aggravation. *Panam*, *Gandusha*, *Virechana* and *Raktamokshana* is done to decrease *Pitta* aggravation. *Anjana* and *Vamana* is done to decrease *Kapha* aggravation. The treatment modalities also give flexible protocols as per *dosha* predominance.

**CONCLUSION:** Ayurveda has explained the classification, diagnosis and treatment of *Luta visha* mainly on the basis of *Dosha* Vitation.

As the *Dosha* vitiation being the basis it simplifies diagnosis and treatment protocols.

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