SNAKE POISON

Just as the root - Venom is the most lethal and truly life-threatening among immovable poisons, similarly, among the movable poisons, the snake-venom is the most lethal and truly life-threatening.

Snakes are present in almost all parts of the world and at all places but are seen more especially in the warm climate and forest areas of the tropics. There are about 2500 species of snakes found in the world. in these

About 216 are found in India, out of which only 52 are toxic.

About two lakh snakebite incidents occur every year in India, out of which an estimated 15,000 to 30,000 people become the victims of death. Some of them die from fear or fear of snakebite. In this regard, the description of Charaka's fear of snake-bite is visible.

TYPES OF SNAKES

According to Acharya Sushruta -

1. **Divine** - mythological soaps like Vasuki, Takshak etc.; And

2. **Bhoomik** - One who walks on the land. terrestrial snakes again

Five main distinctions are considered-

a. Darvikar

b. Mandli

c. Rajiman

d. Nirvish

e. Vaikranj

Types of snakes according to caste

1. Brahmin snake

2. Kshatriya snake

3. Vaishya Snake

4. Shudra Snake

According to Acharya Charak -

According to the scriptures, here the snake is called Darvikara, the circle of kings. The three are respectively irritants to the wind, bile and mucus.

Acharya Charak has mentioned only these three snakes – Darvikar, Mandali and Rajiman. This is the category of three venomous snakes.

Darvikar snake - vata prakopak

Mandali snake- pitta prakopak

Rajiman Snake- kapha prakopak

Classification of Snake Bite

According to Acharya Sushruta

3 types of snake bite :

1 .Sarpit

2. Radit

3. Nirvish

Sign n symptoms of Sarpit snake :

After the snake bite, when the teeth are taken out, there are left one, two or many traces of the teeth; these marks are :

1. deep
2. low
3. those who look like a garland
4. deforming
5. subtle and
6. edema

Sign and symptoms of Radit snakes:

1. lilac, indigo, yellow and white lined
2. low Toxicity

Sign and symptoms of Nirvish snakes:

1. With one or more marks
2. Dyspeptic
3. Infrequent hemorrhage
4. Patient feels healthy

According to Acharya Charak

Symptoms of Darvikar snakebite

1. Blackish discoloration of skin, eyes, nails, teeth, mouth, urine, pimples and bites
2. Dryness in the body
3. Heaviness
4. Arthralgia
5. Weakness in waist, back and neck
6. Yawning
7. Tremors in the body
8. hoarseness of voice
9. gurgling sound in neck
10. Stiffness of the body
11. Dry belching
12. Cough
13. Dyspnea
14. Hiccough
15. Misperistalsis
16. Cramps due to colic
17. Thirst
18. Salvation

Symptoms of mandli snake bite

1.Yellowish discoloration

2.Craving for cold articles

3.Generalized burning sensation

4.Burning sensation- localized

5.Thrust

6.Intoxication

7.Fainting

8.Hyperpyrexia

9.Hemorrage

10.Putrefaction of muscle tissue

11.Edema

12.Gangreneat the site

13.Yellowish colour vision

14.Short tenperedness

15.Pain with burning sensation etc

Symptoms of rajimann snake bite

1. Whitish discoloration

2.Fever with chills

3.Horripilation

4.Stiffness

5.Edema at the site

6.Thick mucus

7.Vomiting

8.Itching in eyes

9.Edema in throat region

10.Hoareseness of voice

11.Difficulty in breathing

12.Black outs

13.Itching etc.

SEA SNAKES

Sea snakes are air breathing, highly venomous reptiles closely allied to the front fanged cobras and kraits, and to a greater degree to the Australian elapids.

In fact, it is believed that present day sea snakes have evolved independently at least twice (there are amphibious sea kraits, and these are totally marine species) and that both groups of sea snakes, tracing their ancestry to the same stock which gave rise to the elapid snakes.

DESCRIPTION

With the body flattened from side to side and the most obvious paddle like tail and the upward positioning of the nostrils, the sea snakes are at ease in the sea.

In addition, they exhibit special adaptations much needed in a marine environment all sea snakes have salt glands in the body to get rid of excess salt and their right lung is extensile and is used for absorption of oxygen and also as a hydrostatic organ which enables the snakes to remain submerged for several hours if occasions so demand.

The skin is rather thick, particularly in between scales which protects against loss of fluid or penetration of the body by salt ions.

Though the sea snakes are graceful swimmers, they are helpless on land where they move with a slow and awkward gait owing to the absence of the enlarged belly scales so characteristic of the land snakes.

Though sea snakes do not exhibit any definite scheme of colouration, majority of them are strikingly banded, for the most part the young are patterned and coloured more distinctively than the adults.

This is primarily because sea snake coloration fades with age.

Sometimes the variation in colour is so great that it is difficult to distinguish the individuals within the species.

FOOD OF AQUATIC SNAKE

- Sea snakes eat fish (particularly eels) and marine invertebrates.
- At least two species eat fish eggs.
- As is with other snakes, sea snakes swallow fish much larger than their size.
- Some sea snakes have curious shapes, which act as a camouflage enabling them to strike the prey in water.
- It is remarkable that some of the longest sea snakes have a small head, hardly wider than neck, and a bulky posterior half of the body.

REPRODUCTION

The majority of sea snakes give birth to live young, but a few species (i.e. the Laticaudinae) are egg layers.

HABITAT

Sea snakes generally prefer inhabiting the shallow waters along the coasts,

Where they can readily dive to the bottom for food and can rise quickly to the surface to breathe.

They are also found among the rock crevices, tree-roots along the beaches, or pilings

That support houses built over the water near the sea shore.

Some species are common in the estuaries.

Sea snakes are attracted by light

That is why they gather in large numbers near the gangways in the hardbours. Like other marine reptiles (sea turtles), they love basking on the surface of water And on days when the sea is calm, hundreds of them can be seen from the bows of steamers. Long columns of sea snakes congregating in thousands have often fascinated the naturalists on sea voyages.

VENOM

Although the sea snakes are generally described as timid and easy going, biting only under provocation or when mishandled, the fact is that all sea snakes are deadly possessing neurotoxic venom which is estimated to be 4 to 10 tilnes potent than that of a cobra. In common with their counterparts - the cobras and kraits, the fangs of sea snakes are short, grooved and immobile. But because their venom apparatus is not as efficient as that of the cobras, sea snakes deliver a lesser quantity of Venom resulting in slow signs of poisoning. There may be no pain or

reaction at the site of the bite and the person bitten by the sea snake hardly feels them. The initial symptoms accompanying the bite range from an ill-feeling or anxiety to muscular stiffness. Late stmptoms include blurred vision, locking of jaws and respiratory difficulties leading to death. The antivenom for sea

snake bite is manufactured in Japan and Australia only and is not

available in India.

DISTRIBUTION

Sea snakes are mostly confined to the tropical portions of the Indian and Pacific Oceans. The species of subfamily Hydrophiinae range from the Persian Gulf to the Idzu sea of Japan, southward to the coast of Tasmania and across the Pacific to the Gilbert Islands. One species, the yellow-bellied sea snake (Peialnis piaturus), occurs outside these limits. It ranges from the east coast of Africa, across the Indian and Pacific Oceans to the west coast of Latin America, and from southern Siberia to Tasmania.

DIVERSITY

Approxinlately sixty kinds of sea snakes are recognized today, of which twenty species are found in the waters of India. These are divided into two subfamilies namely Hydrophiinae (true sea snakes) comprising 18 species, and the amphibious Laticaudinae, including two species.

The members of the Laticaudinae have retained the overlapping dorsal scales and enlarged belly scales (ventrals), as is common with most of the terrestrial species. While the laticaudids may come out of the water to lay their eggs on land.

SEA SNAKES AS FOOD

The deadly serpents of the sea are a popular delicacy in Singapore, Hong kong, Japan and some other countries of the Far East.

The demand for the delicacy is so heavy in Japan that millions of sea snakes are shipped from the Philippines to Japan.

For edible purposes, the snakes are held on pointed bamboo sticks, roasted and smoked and erved with a side dish.

Apart from their food value, the skin of the sea snakes also commands a good market.

BEHAVIOR

- Heyborne noted that water snakes are known to be aggressive. "When handled, they tend to hiss or bite as a defense," he said.
- For this reason, they do not make good pets. They sometimes become aggressive when approached, even if they are not touched.
- Water snakes often climb trees and rest on the branches above the water. If disturbed, they will drop down into the water.
- They tend to be solitary animals and are primarily diurnal, though they sometimes hunt at night as well.
- They hibernate in the winter and are social immediately before and after hibernation. At this time, groups may bask together, according to the ADW.
- Water snakes produce a musky secretion from glands near their tail, said Heyborne, which can be expelled if they feel threatened.
- Water snakes have also been known to defecate and vomit when threatened or agitated.

SEA SNAKES

Class - REPTILIA
Order - SQlJMATA
Suborder - SERPENTES
Family - HYDROPHIIDAE
Subfamily - HYDROPHIINAE






1. ***Astrotia stokesii*** (Gray, 1846)

Stokes' sea snake (or) Large headed sea snake

2. ***Elllzydrina schistosus*** (Daudin, 1803) Common sea snake; Hook-nosed sea snake; Beaked sea snake

3. ***Hydrophis nigrocinctus*** (Daudin, 1803)

Black-banded sea snake or Daudin's sea snake

4. ***Hydrophis obscura*** (Daudin, 1803)

Estuarine sea snake; Eccentric sea snake

5. ***Lapemis curtus*** (Shaw, 1802)

Short sea snake; Short tailed sea snake

6. ***Thalassophis viperina*** (Schnlidt, 1852)

Viperine sea snake

SEA SNAKES

Family - HYDROPHIIDAE

Subfamily - HYDROPHIINAE

Stokes' Sea Snake

1. ***Astrotia stokesii*** (Gray)

- Other common names - Large headed sea snake.

- Distinctive features - Head large, with entire and regular shields,eye moderate or small.Body short, stout and covered with strongly inbricate, pointed and keeled scales, in from 47-59 rows round the body; the keels of dorsal scales often broken up into tubercles and the scales on the forebody often with dentate tips. Ventrals 226-286, in two halves except a few of which being entire anteriorly; preanals strongly enlarged. This sea snake is easily

distinguished by its size, the strongly imbricate body scales and divided belly plates.

- Colouration - Brownish or yellowish brown to orange- red above, with a dorsal pattern of 24-36 broad, dark brown or black bands, or with dorsal bars and ventral spots; the dorsal bands are sometimes interrupted by spots or narrow bars. Head dark olive to yellowish.

- Size - The most massive, if not the longest, of all known sea snakes. Adults attain a maximum length of 1.83 metres. The girth of the type- specimen is about 260mm.

- Habits - The species is involved in the largest concentration of sea snakes reported by Naturalists. The female is reported to produce from 12 to 14 young at a time.

Common Sea Snake

2. ***Enhydrina schistosus*** (Daudin)

- Other common names Hook-nosed sea snake; Beaked sea snake.

- Distinctive Features Head moderate, slightly distinct from neck; end of snout extends over lower jaw, giving a beak-like profile which accounts for the common name(s), ‘Beaked or Hook-nosed sea snake’;Scales keeled and overlapping, in 49-60 row in males, and in from 51-66 row in females; ventrals 239-322 (rarely 354), a little broader than the adjacent scale, each one with two keels; preanals feebly enlarged.

- Colouration: Adults dirty white to pale greenish grey, young with a dorsal pattern of 45-50 jet-black crossbands that are wider in the middle and taper to a point on the sides.

- Size: Most specimens do not exceed 1.4 metres in total length.

- Habits; The common sea snake is generally found in shallow waters with a muddy bottom. It is also frequently noticed in the streams to about the limits of tidal flow. On days when the sea is calm, this snake is seen hiding under the surface, it enters the tidal creeks during the monsoon.

- Disposition: The snake is very aggressive in disposition and bits readily if restrained. However, the fisherfolk throughout Asia pick up the common sea snake with apparent unconcern and throw it back in the sea.

- Venom: The common sea snake is responsible for a considerable number of deaths attributed to the bites of sea snakes, Though sea snakes do not secrete large quantities of venom when they bite, the common sea snake is reported to yield up to 80 mg (dry weight) of venom at one bite.

Black-banded Sea Snake

3. ***Hydrophis nigrocinctus*** (Daudin)

- Other common names - Daudin's sea snake.

- Distinctive features - Head moderate ; body elongate, robust (in the adult), scales imbricate throughout and strongly keeled, in from 39-45 rows at

midbody; ventrals 296-330, distinct throughout, not twice as broad as the adjacent scales; preanals considerably enlarged.

- Colouration - This sea snake is usually olivaceous to brownish above, with 40-60 narrow, dark bands and yellowish below; the dorsal bands, more or less uniform in width and sometimes incomplete ventrally, fade with age. The head is yellowish, with a dark line along the upper lip and dark triangular patch on the top of the head, which extends to the prefrontals.

- Size - 1.08 Inetres

- Distribution - Restricted to the coastal areas of the Bay of Bengal, particularly around the Sundarbans, and the Myanmarese coast.

Short Sea Snake

4. ***Lapemis curtus*** (Daudin)

- Other common names - Short-tailed sea snake.

- Distinctive features - Head large, slightly distinct from neck; nostrils on top of the head, in contact with one another; compressed laterally throughout,

covered with hexagonal or squarish scales which do not overlap one another; the scales adjacent to the belly scales are slightly larger than the other; scale rows 33-39 (in males), 36-43 (in females); ventrals small, distinct anterior, narrower or absent, or vestigial, 154-168 (in males), 160-194 (in females); preanals slightly enlarged.

- Colouration : Variable, Light or dark or greyish above, whitish below, with from 45-55 narrow, black dorsal bars, which taper to a point on the sides or sometimes encircle the body completely. Head blackish in the young, olive or grayish in the adult, with or without a curved yellow mark.

- Size: Up to 1 meter and slightly above.

- Distribution : Coastal areas of the Arabian Sea, Indian Ocean and the Bay of Bengal; common along the Malabar and Coromandal coasts of southern India, although it is rare in the latter region.

Viperine Sea Snake

5. ***Thalassophis viperina*** (Schmidt)

- Distinctive features : Head-short and not very wide, shields entire; nasal subtriangular, as long as broad. Body thick, laterally compressed posteriorly, covered with scales juxtaposed and somewhat hexagonal in shape; scale rows

at mid body 38-47; ventrals 181-291 (or 226-274), broad anteriorly, narrow posteriorly.

- Colouration : Grey above and white below in colour . Some specimens have dark rhomboidal spots or 25-38 bars, while others ,are completely banded.

- Size : Maximum length : 1 metre.

- Distribution: From the Persian Gulf around the coasts of India to southern China and the northern coasts of Borneo and Java.

COMMON TREATMENT OF SNAKE BITE

According to Acharya vaghbhatt

In ayurvedic samhitas the treatment of snake bite has been explained in detail. Except instant and local treatment many other special and combined agadas has also been explained. To reduce the potency of different poison that has reached to different organs special procedures has been given :

The poison on the bite site remains till 100 matrakaal after that it spreads in complete body through dhatus that's why the incision etc should be given so that the poison doesn't spread. The time taken by eyes to blink once is called one **matrakaal**

- The person bitten by snake should do the lepa on the bite site instantaneously either by the use of sand, banana fruit, saliva , ear wax or the snake itself which has bitten.
- Application of torniquette 4 angulas above bite site
- Try to bring out the poison from bite site through compression where application of torniquette isn't possible for example - joints and marma sthana
- If the poison doesn't come out after compression then except in the case of mandali sarpa use cauterization therapy through heating metals like gold or woods
- Below torniquette on bite site the incision should be given for suction to try to eliminate poison
- On areas with subcutaneous fat incision should definitely be given for suction. All these methods are more useful only when the poison is situated on bite site.
- If the poison has spread in full body blood letting therapy should be given

- The blood that has remained in the body because of the heat of visha should be made impotent through the use of cold lepas (ointments), irrigation therapy etc.
- If the blood doesn't stop flowing out of the body because of the vega of visha cold lepas and cold treatment should be given until the person starts feeling goosebumps due of cold.
- Because of the tikshna guna visha harms heart in excessive amount. To protect heart ghee, ghee + honey or the agada in ghee should be given to patient. During the protection of heart the kapha gets accumulated in there due to this the heaviness in heart , malaise and emesis occurs. To reduce these symptoms use to emetic therapy should be done.

Due to the usage of above procedures the poison doesn't spread in body.

Some important Agadas in ayurveda

In the poison of dravikar snakes

1. Grind the root of sindhuvar, Shweta and Girikarnika in water

2. Grind the root of sindhuvar with sindhuvar swaras and give it to drink.

3. Give nasya of kutha and honey.

4. Make a paste of charti and nakuli on the bite site.

In the poison of rajiman snakes

1. Grind Chawlai, Gambhari, Apamarga, Aparajita, Bijora, Sita and Lasode with water and give it. Give the nasya and anjan of it.

2. Give powder of Kaduvi Tumbi, Atees, Kuth, Dhuvasa of Ghar, Harenu, Trikatu and Tagar with honey.

In the poison of mandali snakes

1. Sugandha, Mrdvika, Shweta, Gajakarnika all equal parts;
tulsi leaves, cath, bilva and pomegranate and take half and half part and lick it after mixing it with honey.

2. Give the powders of Panchavakal, Triphala, Mulethi, Nagkesar, Elvaluk, Jivaka, Rishabhak, Sandalwood, Sita, Lotus and Padmakha with honey.

3. Give water from Gambhari, Banyan's Shunga, Jivaka, Rishabak, Sita, Majith and liquorice.

In the venom of Gonas snakes

1. Make the bark and seeds of Bamboo, kutki, seeds of padal, dry ginger, seeds of shirish, root of Atis, Gavedhuk and vacha after grinding them in cow urine.

The following method is also adopted in place of Kakapad incision on the head for venom-traction. As per the rooster the rooster dies instantly due to the venom being drawn out by the cistern. Again the second rooster is plucked. He too soon dies. Then in the same way, one by one they keep on smothering the chickens until they stop dying. The survival of the chicken in the above condition is considered to be the proof that the poison has been completely removed from the patient's body. This is also a miraculous experiment, whose success is considered unquestionable.

Treatment of visha reaching various tissues and organs

In blood venom

1. Mix the bark of the root of lasodha, the buds of berry and sycamore and the caulk of Aparajita and give it a drink.

In flesh poison

1. Khadir - wood, neem and Kutz
Grind it with honey and drink it.

2. Grind Bala, Atibala, Mulethi, Manphal and Tagar and dissolve it in water and give it a drink.

Venousvenom

• Powder or caulk of any one or more of the following substances

Use as Nasya -

1. Dupahiya
2. Bharangi,
3. Shyama Tulsi,
4. Pippali, Asafoetida, Scorpion, Mansil, Sirish seeds, Apamarga seeds and salt;
5. Pippali, Nakchikni, Ativisha and Black pepper.

In axillary venom

1. By giving a feeling of Pippali, Black pepper, Yvaakshara, Bach, Rock salt and Drumstick powder in the pitta of Rohit fish;
2. By stirring fine powders of sandalwood, liquorice, balsad, pippali, black pepper, nilkamal and rock salt in cow's bile;

3. Fruits of Karanj, Trikatu, Bilvamool, Turmeric, Baruhaldi and Grinding basil flowers in goat's urine; Or

4. Grind Balchhad, Gunja and Khus with water and put it in the eyes.

In gut venom

• Lick the pulp of cath by mixing honey and sugar candy.

In gastric poison

• Take the powder of sugarcane mixed with honey and sugar candy. in pancreatic venom
• Grind equal parts of madder, turmeric, barberry and pippali in cow's bile and drink it.

In cholelithiasis

• Removes the toxin in the gall bladder by purgation. The patient suffering from poison should get virechana done while lying on the bed. Due to repeated rise, the poison inflames the air.

In veneral poison

Calm down the poison that has reached the stomach by mixing it with ghee.

On increasing phlegm in the throat of a poison patient

Mix pippali, dry ginger and yavakshara in butter and do pratisarana in the gut. In order to reduce the potency of poison on the bite of mucous snakes in a person of Kapha nature, give vomit. Vomiting must be done on the bite of a snake above the navel.

If the vata becomes irritable after the release of poison, then except oil, honey, linseed and acid liquids, treatment should be done with aphrodisiac affection etc. When the bile is irritated, it should be pacified with the antipyretic astringent, affection, basti etc. In case of irritability of Kapha, Kwatha of medicines of Argvadhadi Gana should be taken with honey.

Comparative study of sea snakes with Mandali sarpa in accordance to ayurveda

	sea snake	**mandali sarpa**
IDENTIFICATION	•large and flattened body • paddle like tail. • facing upwards	•large bodied and variegated.

		• they have various kinds of mandals. • these are sluggish in movement. • they have lustre like fireflame and sun.
VENOM	neurotoxic and myotoxic	neurotoxic and myotoxic
SYMPTOMS	• dizziness • nausea • weakness • respiratory collapse • affects muscles	• yellowish discoloration • craving for cold • burning sensation • intoxication • painless bite • petrification of muscles • gangrene at the site

So through these points as they are both neurotoxic and myotoxic as they both affect muscle and neuron and mandali sarpa can also live in sea water. So, it can be concluded that we can compare mandali sarpa with sea snake in ayurveda.

आचार्य चरक के अनुसार

भीतमत्ताबलोष्णक्षुत्तृषार्ते वर्धते विषम् ।

विषं प्रकृतिकालौ च तुल्यौ प्राप्याल्पमन्यथा ।।

वारिविप्रहताः क्षीणा भीता नकुलनिर्जिताः ।

वृद्धा बालास्त्वचो मुक्ताः सर्पा मन्दविषाः स्मृताः । । (च.चि. 23/162)

आचार्य चरक के अनुसार उन व्यक्तियों में सर्पविष का वेग वृद्धि को प्राप्त होता है जो डरे होते हैं, पागल होते हैं, निर्बल होते हैं, उष्णता से त्रस्त होते हैं, और क्षुधा तृष्णा से पीड़ित होते हैं। इसी प्रकार जब विष के समान ही मनुष्य की प्रकृति हो और काल भी (7 विषप्रभाव के तुल्य हो, तो भी विष का वेग वृद्धि को प्राप्त होता कु है। जब विष की प्रकृति से भिन्न प्रकृति का मनुष्य दंश का शिकार होता है और काल एवं ऋतु भी भिन्न प्रकृति के होते हैं तो विष का वेग क्षीणता या ह्रास को प्राप्त होता है तथा विष अधिक प्रभावी नहीं होता है।

जो सर्प जल में रहने वाले होते हैं, जो दुर्बल होते हैं और कृश होतेहैं, जो डरपोक होते हैं, जो युद्ध में नकुल (नेवला) से पराजित हुए होते हैं, जो वृद्ध होते हैं और जो अपनी केचुल छोड़ चुके होते हैं, वे मन्दविष वाले होते हैं।

आचार्य वृद्धवाग्भट के अनुसार

जलाप्लुता रतिक्षीणा भीता नकुलनिर्जिताः ।

शीतवातातपव्याधिक्षुत्तृष्णा श्रमपीड़िताः ।।

तूर्णं देशान्तरायाता विमुक्तविषकञ्चुकाः ।

कुशौषधीकण्टकवद्ये चरन्ति च काननम् ।।

देशं च विद्याध्युषितं सर्पास्तेऽल्पविषा मताः ।। (अ.सं.उ. 41/47)

आचार्य वृद्धवाग्भट के अनुसार जल में डूबे, सम्भोग से क्षीण, भयभीत-नकुल आदि से परास्त; शीत, वायु, धूप, रोग, भूख, प्यास, थकान आदि से पीड़ित; शीघ्र ही दूसरे देश (प्रदेश) से आव्रजित, तुरन्त ही विष-केंचुल त्यागनेवाले, विषघ्नी विद्या (महामायूरी आदि) से अध्युषित स्थान में रहनेवाले तथा कुशा-औषधि (विषघ्नी औषधियों) तथा कँटीली झाड़ियों के प्रदेश में रहनेवाले सॉप अल्पविषवाले होते हैं।

आचार्य सुश्रुत ने इनमें अति वृद्ध, अति बाल, उद्विग्न और रोगी सर्पों का भी समावेश किया है। सम्भवत: इनमें विष अल्प मात्रा में और अल्प वीर्यवाला होता है, इसीलिए काटने पर कम चढ़ता है।

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