



Review Article

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A CLASSICAL REVIEW ON SNAYUKA ROGA WITH SPECIAL REFERENCE TO DRACUNCULIASIS

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ABSTRACT

Snayuka roga is caused by a kapha-raktaja krimi, named Snayuka. In Ayurveda, reference of Snayuka roga is available in Bhavprakash, Sharangadhara Samhita, Madhava Nidana and Yogaratnakara. This disease is characterised by shotha (swelling), daha (severe burning sensation), discolouration of skin, blisters formation similar to visarpa (Erysipelas) and it further worsens the condition if the jivam (worm) crawls out of ulcer breaks further worsens the condition. On complete exit of worm from body through the wound, the symptoms get reduced. However, it can reoccur in other distant places. These symptoms and presentation of Snayuka roga resembles with Dracunculiasis in modern science, which was endemic in various countries in last century. Dracunculiasis, a vector-borne disease, commonly known as Guinea-worm disease, is caused by the parasite called *Dracunculus medinensis*, commonly called as "Guinea-worm". Its larvae migrate through the Cyclops containing water to the hosts by drinking and after degeneration of Cyclops in the stomach; they migrate to subcutaneous tissues, causing severe pain along with burning sensation followed by local swelling, blisters and finally an ulcer. In India the GWD was endemic in 89 districts in seven states. India was declared as guinea worm disease free country by WHO in 2000. But intestinal parasitic infection is a main public health problem in developing countries. There is need to create awareness among people about intestinal parasitic infections. Hence, here an effort has been made to understand and review Snayuka roga, caused by Snayuka krimi as explained in Ayurvedic texts, correlating Dracunculiasis (Guinea worm disease- GWD).

Keywords: Snayuka roga, Dracunculiasis, Guinea worm, Snayuka krimi, GWD.

INTRODUCTION

In Ayurveda, Snayuka was first quoted by Acharya Sharangadhara as one among twenty types of Krimis (worms), during rogaganana in Purva Khanda. He further denotes it as kapha-raktaja in origin.¹ Acharya Madhava author of Madhava Nidana is identified as most authentic and specific on concepts related to Nidana and he has explained 'Snayuka Nidanam' in parishistha.² Nidana, lakshana and chikitsa of Snayuka roga are elaborately described in Bhavprakash authored by Acharya Bhavamishra.³ A detailed description of Snayuka roga is also discussed in Yogaratnakara. Along with this, Yogaratnakara also classifies Snayuka roga into eight types based on doshik predominance with lakshanas.⁴ This is a unique work by him in comparison to other Acharayas. Snayuka roga is also called as 'Snayu roga' as mentioned in Bhavprakash.⁵ The etiopathology, presentation and manifestation of Snayuka roga resembles with Dracunculiasis explained in modern science.

Dracunculiasis is also called Guinea-worm disease (GWD). Infestation of this nematode is caused by ingestion of contaminated water infected with guinea worm larvae. These larvae get primarily liberated into water from the lesion of that infected person upon immersing leg into water. The wound consists of gravid female worms and they liberate larvae. These larvae thereby contaminate water and reach infective stage once are been ingested by tiny crustaceans or Cyclops or copepods or water fleas. Through the intake of contaminated water, the one individual swallows the infected Cyclops and these get killed in

the stomach followed by liberation of the infective larvae form. These larvae penetrate the wall of the intestine and migrate throughout the body and ultimately form a blister in extremities. Thus, it takes about a year after infection for painful blister to arise, usually in lower leg. From this blister one or more worms can emerge associated with immense burning sensation. Patients often immerse the infected part of the body into water to get a cooling effect until burning sensation is relieved. The worm thus gets an opportunity to release plenty of larvae into the water. This vicious cycle continues again. Due to these painful blisters patient may find it difficult to walk or work.⁶ So, there is a huge similarity between these two diseases and correlation can be tried based on the evidences. The worm was widely present in tropical Africa, the Middle East in Arabia, Iraq, Iran and in Pakistan and India. In India, it was seen in the dry areas in Rajasthan, Gujarat, Madhya Pradesh, Andhra Pradesh, Maharashtra, Tamil Nadu and Karnataka. About 50 million people were estimated to be infected with the worm. The disease still remains endemic in 13 African countries including Sudan (highest incidence), Niger, etc.⁷ Although, after the successful conclusion of the smallpox eradication campaign in 1979, public-health experts sought Dracunculiasis for another potential disease candidates for eradication.⁸ The infection has been eradicated from India and all of Southeast Asia region by 2000. India was declared as guinea worm disease free country by WHO in 2000.

Here in this article, the Nidana, Rupa, Samsthana, Samprapti and upadrava of Snayuka roga as mentioned in classics are discussed descriptively and an effort has been made to make a bridge

between Snayuka roga and Dracunculiasis (Guinea worm disease-GWD) through its etiopathology, presentation, manifestation and complications with the help of Ayurvedic texts and modern concept.

Classical view on Snayuka roga

Nidana (Etiological Factors)

‘Atyantavrishtyaadi nimitto yada seveta dushtam bahusho
jalam’⁹

‘Tantunibham jeevam vrittam shwetadyutih bahih’¹⁰

Consumption of dushta jala produced from heavy rain (contaminated water) should be regarded as Nidana (cause). Consumption of that dushta jala (contaminated water) containing krimi (worm) enters the body and results in dushti (vitiation) of Doshas leading to Snayuka roga. Acharya Bhavamishra has mentioned this krimi as ‘jivam’ having round, whitish thread like structure. This white live worm resembles tendon and thus named as Snayuka which is a kapha-raktaja krimi (worm/parasite arise from kapha and rakta) as per Acharya Sharangadhara.

Rupa (Clinical Presentation)

‘Shotham kritvaa visarpavat’

That means Snayuka roga presents with shotha which is similar to shotha in visarpa. This phenomenon may be understood as the vitiated Doshas reside in bahya rogamarga i.e. Shakha. It results in formation of shotha (swelling) along with formation of skin lesion resembling Visarpa (erysipelas).

‘Bhinatti tatksate tatarasoshma snayu vishoshya cha’

When the blister ruptures, then the heat generated in the lesion dries up to form a snayu (ligament) like worm and forms a wound.

‘Shanaih shanaih kshataadyati chhedaat kopamupaiti cha’

The manifestation and the pathogenesis of the disease are very slow and worm frequently comes out.

‘Tat paataat shotha shaantihsyaat punaha sthaanaantare bhavet’

On complete exit of worm from body through the wound, shotha (swelling) gets reduced. However it can reoccur in other places.

‘Vaatenah shyavarukshah sarugatha dahanaaneelapeetah
.....sarvalingo’

This indicates specific features of Snayuka according to their doshik predominance.¹¹

Samsthana (Manifestation Site)

‘Shaakhaasu kupito doshah’

Here ‘Shakha’ refers to Bahya rogamarga- ‘Raktaadidhatutwak cha’ (skin including raktadi dhatus). The progression of the disease also happens with involvement of successive dhatus. Shakha may also be interpreted as involvement of extremities or limbs.

‘Shanaih shanaih’

It means the progression of the disease or manifestation of symptoms is very slow and slowly worm comes out from the wound.

‘Baahvoryadi pramadena janghayoh trutyati kwachit’

It proves that the lesion becomes manifested in upper and lower extremities.¹²

Upadrava (Complications)

‘Baahvoryadi pramadena janghayoh trutyati kwachit |
sankocham khanjataam chaiva cchinastantuh karotyaso ||’

If due to mistake or carelessness, the living worm creeping out of the wound breaks in limbs or leg or calf region then it leads to contracture and lameness.¹³

Samprapti (Pathogenesis) of Snayuka Roga

Dosha inside the body becomes vitiated by consumption of Dushta jalam. Then that Prakupita dosha either in single or associated with other Prakupita doshas (dwidoshaja) or sometimes with all three Prakupita doshas (tridoshaja), travel to Shakha (extremities) vitiating twak and raktadi dhatus and gets located at Khavaigunya Sthana (usually limbs) and results in Shotha (swelling) resembling Visarpa (blisters). This shotha (swelling) ruptures / bursts, due to heat generated in the wound dries up the Snayus (tendon), and a white, thread-like, elongated creature gets produced which crawls out. This live worm resembles tendon (snayu) and thus named as Snayuka. This Snayuka will afflict neighbouring tissues and results in formation of blister followed by a wound. If complete worm comes out of the wound, the symptoms subside and patient gets relief. However, it may appear in other distant location. Due to carelessness or if not treated in time or by mistake while extracting the worm, If the worm breaks in affected limb, it may lead to Sankocha (contracture of the limbs) or may become victim of Khanjatwa (lameness). This etiopathogenesis of Snayuka roga resembles Dracunculiasis in contemporary science as explained above.

Samprapti Ghataka of Snayuka roga

Dosha: Vata, pitta, kapha

Dushya: Twak, rakta, mamsa dhatus

Agni: Jatharagni

Agnidushti: Mandagni

Srotas: Annavaha srotas, Rasavaha srotas, Raktavaha srotas

Srotodushti: Vimargagamana

Adhishthana: Shakha

Udbhavasthana: Amashaya

Vyaktasthana: Bahu, Pada, Jangha

Rogamarga: Bahya Rogamarga

Swabhava: Chirakari

Sadhyaasadyatwa: Kricchrasadhya

Bheda (Classification) of Snayuka Roga

Acharya Yogaratnakara classifies Snayuka roga into eight types. In Yogaratnakara, eight types of Snayuka are mentioned based on doshik predominance (Table 1). Same explanation is also found in Madhava Nidana. This may be interpreted as different stages and symptoms encountered in Dracunculiasis.

Table 1: Classification of Snayuka roga¹⁴

Type of Snayuka roga	Lakshana
Vataja Snayuka	Shyava, Ruksha, Sarook (blackish red, dry and painful)
Pittaja Snayuka	Neela, Peeta, Dahana/sadaha (bluish yellow associated with burning sensation)
Kaphaja Snayuka	Shweta, Prithu, Garima (white, thick and heavy)
Vata-pittaja Snayuka	Manifest with dwidoshaja lakshanas.
Vata-kaphaja Snayuka	
Pitta-kaphaja Snayuka	
Raktaja Snayuka	Aaraktakanti, Adhika daha (red and with severe burning sensation)
Tridoshaja Snayuka	Manifests with all tridoshaja lakshanas in combination.

Life cycle of *Dracunculus medinensis*

Dracunculus medinensis i.e. guinea worm, measures about one to two millimetres wide and an adult viviparous female worm measures about 60 to 120 centimetres long (usually males are much shorter about 10–40 mm)¹⁵. Outside the humans, the young guinea worm can survive up to three weeks, during which they have to be ingested by water fleas or Cyclops to continue further development and life cycle. The larvae inside body of Cyclops can survive up to 3–4 months. The Cyclops is killed by the gastric acidity and the guinea worm larvae present in its hemocele are released. The larvae penetrate the wall of the duodenum and reach the retroperitoneal and subcutaneous connective tissues. Here, the larvae develop into male and female adults in about 3–4 months and mate. After mating, the male worms die in the tissues and sometimes become calcified. In another 6 months time, the fertilized female worm grows in size, matures, and migrates within the connective tissues throughout the body, to finally reach a site where it is likely to come into contact with water.¹⁶ This adult mature worm manifest papulo-vesicular lesion followed by blister formation which further ruptures and releases a milky-white fluid containing numerous larvae which are swallowed by the Cyclops which is the intermediate host.¹⁷ The larvae penetrate the gut wall of the *Cyclops* and enter its body cavity, where they molt twice to form infective third stage larvae. Then the cycle continues.

Chikitsa of Snayuka roga Along With Treatment of Dracunculiasis

Samprapti Vighatana is Chikitsa and Acharya Bhavamishra has given the treatment principle of Snayuka roga in the chapter-Snayurogaadhikara in Bhavaprakash. Generally, therapies prescribed for Visarpa (Erysipelas) are advocated in Snayuka. As Snayuka is a type of krimi, the line of treatment should be like Apakarshana, Prakriti vighaata and Nidana parivarjana.¹⁸ For Apakarshana, the tantunibha jeeva should be extracted out carefully and slowly to give relief to the patient symptomatically. For Prakriti vighaata, Swedana with bheka saadhita kanji, lepa with babula beejapishta or shigramulapatra macerated with saindhav yukta kanji should be applied locally and gavyasarpipaana for consecutive 3 days followed by nirgundi swarasa paana for another consecutive 3 days or sushavya mula macerated with cold water or gandharvagandha siddha ghrita paana or churna of Ativisha, Mustak, Bhargee, Shunthi and Pippali etc. can cure Snayuka roga as mentioned by Acharya Bhavamishra.¹⁹ And above all Nidana Parivarjana is the prime among the three. For that, patient and who are susceptible to get infected should take fine-cloth-filtered water as the tiny worm will get stuck in the sieve like cloth and clean water will be obtained as filtrate that can be safely drunk—as mentioned by Acharya Kullukabhata and Vriddha Vagbhata.²⁰

In modern concept, prevention has an important role, can be achieved through early diagnosis of the disease and avoiding the individual from immersion of wound in drinking water source to

decrease further spread of the parasites. Provision of protected piped water supply is the best method of prevention or else boiling or filtering water through a cloth and then consuming. Contaminated drinking water should be treated with a chemical called Abate in order to kill the larva. Till date no medication or vaccine against the disease is found. Some antihistaminic, anthelmintic and antibiotics are used here as medications. The worm may be removed slowly over a few weeks by rolling it over a stick very carefully not snapping the worm.²¹ So, in case of treatment principle also both of the concepts Ayurveda and modern are same.

DISCUSSION

Snayuka roga is caused by Snayuka krimi, a kapha-raktaja krimi (worm/parasite arise from kapha and rakta) whose jeeva is vritta (round), tantunibha (thread like) and shwetam (white in colour). Nidana (cause) of Snayuka roga should be considered as Dushta jalapaana (consumption of contaminated water). General and specific lakshanas (symptoms) include shotha with visarpa which ruptures and worm comes out; along with ruk (pain), dahana (burning sensation), adhika dahana (severe burning sensation), shakhaasu shotha (swelling in the extremities); finally the worm breaks while removing from skin, it will result in Sankocha (contractures of limbs) and Khanjatwa (lameness of limbs). Generally this is a vyadhi of bahya rogamarga and usually manifested at Bahu-Pada-Jangha (extremities). And above all the total progression of the disease is long. On the other hand, it is noteworthy that Dracunculiasis also result from consumption of contaminated water from various water sources. The morphology of the viviparous adult female worm is explained as a long, cylindrical worm with milky white cuticle resembling a long piece of white twine, which has a blunt anterior end and a tapering recurved tail. In Dracunculiasis, a blister is formed at the point of exit commonly in the feet between the metatarsal bones or on the ankles. This blister ruptures and milky-white liquid oozes along with worm crawls out. It is quite interesting that the blister develops initially as a reddish papule with a vesicular centre and surrounding induration which resembles like visarpa (erysipelas). The fluid in the blister is a sterile yellowish liquid with polymorphs, eosinophil's and mononuclear cells which causes oedema to surrounding tissues.²² Female worm burrows through the deeper connective tissue, it takes years to develop completely and later blisters manifest over the skin including the subcutaneous tissues. In Guinea-worm disease, incubation period is about 1 year and the entire life cycle of guinea-worm takes about a year; so that all the infected persons develop the blisters and present with clinical manifestations at about the same time of the year. In Dracunculiasis also, after complete removal of worm symptoms get relieved. But during removal if the worm breaks, then complications arise.

In this inflammatory stage, suffering individual dips his leg with blister and wound in water to reduce severe burning sensation and pain. Then the larvae come out and get mixed in that water and ingested by water fleas or Cyclops to continue further

development and life cycle. Larvae present in water fleas or Cyclops when ingested through contaminated water by humans, fleas are destroyed in gastrointestinal system and larvae migrate from intestine to different parts of the body. Dracunculiasis parasite *Dracunculus medinensis* usually afflicts lower limbs. Along with the other similarities, treatment principles are also similar in these diseases. In case of guinea-worm disease, removal of the worm is the best method as it is the safe and effective ancient technique by patiently twisting it around a stick. It may take 15-20 days to extract the whole worm but care should be taken not snapping the worm.

CONCLUSION

So, the above study shows a great similarity in between Snayuka roga and Dracunculiasis. Most description regarding Snayuka roga encounters in Ayurveda literature is analogous with Dracunculiasis. Hope this study draws an effort to understand Snayuka roga caused by Snayuka krimi in the light of Ayurvedic texts. Hence Snayuka roga can be correlated with Dracunculiasis explained in modern science, caused by nematode *Dracunculus medinensis*.

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