



Review Article

www.ijrap.net (ISSN:2229-3566)



A CRITICAL REVIEW ON MADHUMEHA JANYA TWAK-GATA VATA WITH SPECIAL REFERENCE TO DIABETIC PERIPHERAL NEURITIS

Karishma *

Professor, Dept. Of Dravyaguna, Yenapoya Ayurveda Medical College and Hospital, Mangalore, Karnataka, India

Received on: 15/04/21 Accepted on: 15/07/21

*Corresponding author

E-mail: karishmayamch@yenepoya.edu.in

DOI: 10.7897/2277-4343.1204119

ABSTRACT

With the increasing prevalence of Diabetes mellitus especially in the middle age group, the chances of developing neuro-vascular complications are very high. One such complication is Diabetic Peripheral Neuropathy / Distal Symmetric sensory Polyneuropathy (DSPN). Diabetes mellitus can be correlated to Madhumeha and its complication Peripheral neuropathy to that of Twak-gata vata. Twakgata vata is one such vatavyadhi which can manifest in a Madhumeha Rogi. According to Acharya Charaka, Prakupita vata localized in twak brings about dryness of skin, skin cracks open, numbness in that part, emaciation, black discolouration, pricking type of pain, a feeling of stretching in that part, redness, and pain in small joints. Charaka has explained the special reason for the manifestation of a vatavyadhi. He says that depending upon the specific cause and site the aggravated vata produces different types of vyadhis, like twak-gata vata, raktagata vata, etc. Though, Daha as a lakshana has not been mentioned under Twakgata vata lakshanas, when there is anubandha of vata with pitta, daha is seen. Sushruta says in rasa-rakta etc., if vata gets associated with other doshas it produces various disorders. Ex: If there is daha, then association of vata with pitta should be inferred.

Keywords: Madhumeha, twak-gata vata, diabetes mellitus, diabetic neuropathy, distal symmetric polyneuropathy.

INTRODUCTION

Ayurveda is a time-tested treasure of medical knowledge which focuses on natural and holistic therapies that create an excellent environment for healing. In the present era due to stressful and non-justifiable lifestyle man is becoming prey to various diseases. One among them is Diabetes Mellitus which can be correlated to Madhumeha. Being a vataja prameha it is said to be asadhy.

Though this condition can be controlled, because of hyperglycemia it can give rise to various complications like diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, etc. which can bring enormous burden on the family, society and healthcare providers involved in the management of diabetes due to its high morbidity and mortality.

Diabetic neuropathy is a group of nerve disorders caused by diabetes. Among the four types of diabetic neuropathy namely- Autonomic, Peripheral, Proximal and Focal, the peripheral neuropathy or Distal Symmetric Sensory Polyneuropathy (DSPN) refers to the functional impairment of many peripheral nerves simultaneously and symmetrically. It is characterized by numbness generally initiated with tingling sensation, burning sensation and pain in the feet. Its incidence fairly depends upon the effective maintenance of blood glucose levels. It is a debilitating complication that has been well characterized in adults, with prevalence rates ranging from 10–26% in newly diagnosed adults with diabetes¹. A complete loss of sensation can result in severe complications of minor injuries ending up with gangrene necessitating amputation. Though one does not find any description as such in the classics regarding the above-mentioned features, the entity can be correlated to Twakgata vata lakshanas which can manifest in an improperly managed Madhumeha Rogi, lakshanas being daha, suptata, toda, chumachumayana, rukshata etc.

Diabetic Neuropathy

Diabetic neuropathies are a group of nerve disorders caused by diabetes. It is a descriptive term meaning a demonstrable disorder, either clinically evident or sub-clinical, that occurs in the setting of diabetes mellitus without other causes of peripheral neuropathy. It manifests in the somatic and/or autonomic parts of the peripheral nervous system.

According to recent studies diabetic neuropathy is more common in Type 2 diabetes mellitus and its prevalence increases as the duration and severity of diabetes mellitus increase. In 10% of patients, neuropathic complaints are evident at the diagnosis of diabetes mellitus. The risk of neuropathy increases over time so that more than 50% of diabetics are affected after 10 years.

People with diabetes can develop nerve problems at any time, but the longer a person has diabetes, the greater the risk. An estimated 50% of those with diabetes have some form of neuropathy, but not all with neuropathy have symptoms.

Peripheral Neuropathy

It is the impairment of functions of many peripheral nerves simultaneously and symmetrically. It is the most common type of diabetic neuropathy and is also called Distal symmetric sensory polyneuropathy. It starts in the long nerve fibers of the toes and fingertips. Symptoms then move proximally into the legs, arms and then trunk. This can lead to alterations in normal sensations and predisposition to injury, ulceration, and chronic infection.

Madhumeha is a vata Pradhana vyadhi associated with dhatus, kshaya, oja kshaya and vata prakopa. Dhatus, kshaya due to vyadhi Swabhava itself can lead to vata vriddhi in the body which in turn aggravates the existing vitiated vata dosha in a Madhumeha Rogi. This vicious circle sets in. Hence various vatajanya vikrutis can

manifest in an improperly managed Madhumeha Rogi. Vata prakopa occurs in two conditions:

- Dhatukshaya
- Margavarodha

Charaka opines that when there is depletion in the Prakruta pramana of any dosha, dhatu, upadhatu or mala i.e., kshaya in their snigdha etc., gunas, then in the empty srotases and ashayas, the matra and kriya of vata increases and the concerned vata vyadhis manifest². Twakgata vata is one such vatavyadhi which can manifest in a Madhumeha Rogi.

Lakshana

According to Charaka, Prakupita vata localized in twak brings about dryness of skin, skin cracks open, numbness in that part, emaciation, black discolouration, pricking type of pain, a feeling of stretching in that part, redness, and pain in small joints³. Bhavamishra opines that there will be pain in all the layers of twak.

According to Madhukosha commentary, twak should be considered as rasa- dhatu. Shrikanta datta opines that twak along with its corresponding rasayana should be considered together. Twak at certain places is also called udakadhara as udaka is a

component of rasa dhatu. Thus, twak is an ashraya for rasa dhatu. Acharya Sushruta has explained that when vata gets lodged in a particular dhatu it produces a specific type of disease. In the twakgata vata lakshanas, he has included sphurana, paripotana, and chumachumayana along with other lakshanas told by Charaka. He is also of the similar opinion that rasa-dhatu should be taken as twak⁴. According to Basavaraja, Twakgata vata lakshanas are twak sphutana, sarvanga pada mula vidarana and Kara pada vidaha⁵.

Samprapti of Twak Gata Vata

The manifestation of the features of twak gata vata in a Madhumeha Rogi can be thought to proceed in the following manner: In a Madhumeha Rogi, Prakupita vata takes / move in triyak gati and gets localized in rasa-dhatu. This pravruddha vata yukta rasa is Sarva-shareera gata i.e., circulates throughout the body. When it reaches adhodeha, this pravruddha vatayukta rasa dhatu is unable to move upwards because of rasayani daurbalaya. Thus, while staying in adhodeha for quite a long period, it gives rise to a lakshana samuha which simulates with Twakgata vata lakshanas. Hence these lakshanas are seen first in Ubhaya pada, later these may spread all over the body, if the condition is not managed properly and in time. Schematic representation of Madhumeha janya twak gata vata Samprapti is shown in Figure 1.

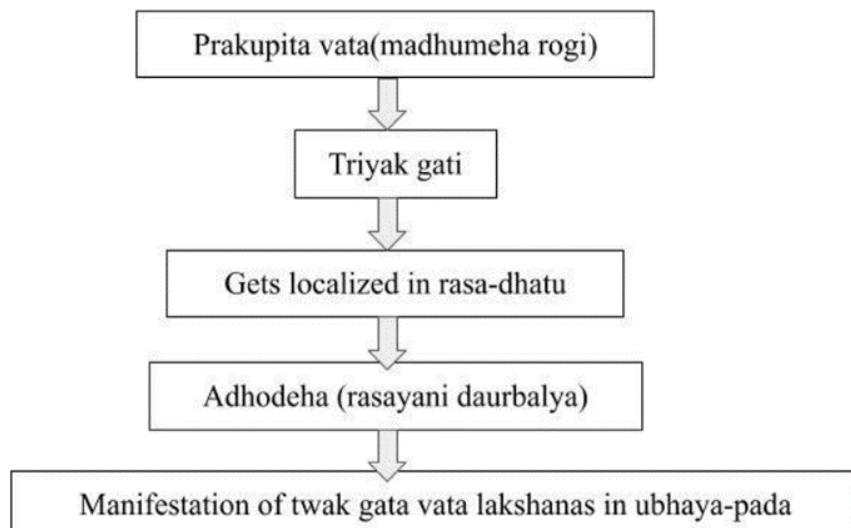


Figure 1: Schematic Representation of Samprapti of Madhumeha janya twak gata

To substantiate the said Samprapti, the following references from various classics can be taken into consideration.

- Sushruta, while explaining the pathogenesis and localization of prameha Pidakas opines that due to the laxity / atony of the rasayanas i.e., dhamanis carrying rasa, pitta and kapha, in the patients of Prameha / Madhumeha, doshas are unable to move upwards and as such they stay in adhodeha and Pidakas manifest in lower part of the body⁶.
- Charaka enumerates dhatu kshaya, roga atikarashana and dhatu karshana etc. as vata Prakopaka Nidanas which lead to Vata vyadhis. All these vikritis are seen in a Madhumehi which leads to vata prakopa.
- Charaka opines that the circulating rasa dhatu, when obstructed in its path somewhere in its srotas, produces disorders there itself, just like clouds in sky rain, when they

get blocked. The same explanation holds good for Sushruta's definition of sthana-sanshraya⁷.

- Vaghbata opines that in all types of vyadhis, the Prakupita doshas reach the rogadishthana with the help of rasayanas, which supply that adhishtana⁸.
- Charaka has explained the special reason for the manifestation of a vatavyadhi. He says that depending upon the specific cause and site the aggravated vata produces different types of vyadhis, like twak-gata vata, raktagata vata, etc.
- Though, Daha as a lakshana has not been mentioned under Twakgata vata lakshanas, when there is anubandha of vata with pitta, daha is seen. Sushruta says in rasa-rakta etc., if vata gets associated with other doshas it produces various disorders. Ex: If there is daha, the association of vata with pitta should be inferred.

Distal symmetric polyneuropathy/ Diabetic peripheral neuropathy (DSPN)

Distal symmetric polyneuropathy is the most reported form of neuropathy in diabetics. It is commonly known as diabetic peripheral neuropathy.

It was noted that the prevalence of this type of neuropathy increases with the duration and severity of diabetes. As this is a disease of the periphery the major symptoms are noted in the feet and hand. It manifests as a symmetrical distal sensory polyneuropathy, sparing motor functions. The pattern of spread being "glove and stocking". It damages the nerves in the legs and arms. The feet and legs are likely to be affected first before hands and arms. Worsening is more severe in the legs than in the arms and proceeds in a centripetal symmetrically graded manner. The symptoms of peripheral neuropathy may include

- Numbness or insensitivity to pain or temperature- The patient may complain that the feet have a numb or wooden feeling or may say "I feel as though I am walking on stumps."
- Tingling, burning, or prickling sensations are referred to as 'pins and needles' in the feet.
- Sharp pains or cramps.
- Extreme sensitivity to touch, even a light touch.
- Weakness, loss of balance and coordination.

Usually, the symptoms are worse at night, sleep is disturbed and even the bed linen may produce severe pain on touch.

Pattern of spread of distal symmetric sensory polyneuropathy

All the symptoms are related to nerve damage and their dysfunction. Peripheral nerves are composed of large and small diameter nerve fibers. Symptoms associated with large fiber dysfunction include numbness, tingling, weakness, and loss of balance. Symptoms associated with small fiber dysfunction include burning sensation, pain, anesthesia to pain and temperature sensation and autonomic dysfunction. In DSPN, the appearance and progression of symptoms depends upon the length of the nerves so that it first affects the longest nerves in the feet. DSPN involves all nerve fiber types but small fiber dysfunction may predominate, especially in the early stages of neuropathy. Early symptoms which are more prominent at night are bilateral symmetrical foot paraesthesia's and pain, often described as tingling, burning, prickling, shooting pain, deep aching, pins and needles, tightness etc. Evidence of large fiber dysfunction, such as sensory loss, numbness, tingling and loss of coordination may appear as the neuropathy progresses. Motor symptoms and signs are generally minor and occur late. All symptoms migrate centrally over time to affect the proximal parts of lower limbs and upper extremities. This classic pattern of sensory symptoms in DSPN is termed the "stocking glove" distribution.

The first symptoms tend to be sensory and consist of tingling, prickling, burning or band like dysesthesias in the balls of the feet or tips of toes, or in general distribution over the soles. With progression, pain sensory loss is usually found over both feet, ankle jerks are lost and weakness of dorsiflexion of the toes, best demonstrated in the great toe, may be present. Worsening is more severe in the legs than in the arms and proceeds in a centripetal, symmetrically graded manner. By the time the sensory disturbance has reached the upper shin, dysesthesias are usually noticed in the tips of fingers. As the painful symptoms often result from small fiber dysfunction, patients may have accompanying abnormalities of autonomic function in the feet, ex: decreased sweating, dry skin etc. the autonomic dysfunction may affect

another organ systems ex: sexual dysfunction. The symptoms are initially mild and may go unnoticed; but can eventually become disabling⁹.

Complications

A major concern in DSPN is the development of diabetic foot ulcers, as one of the commonest complications is tissue damage, especially in the feet. Foot ulcers are multifactorial in origin with neuropathy, autonomic dysfunction, and vascular insufficiency all possibly contributing to this debilitating complication. The tissue damage may occur in the feet because of unnoticed injury (either mechanical or thermal). Pressure from shoes or a burn may lead to a blister which later becomes an ulcer. Foot ulcers typically occur in areas under mechanical stress Ex: weight bearing areas of foot or because of poorly fitting shoes. The loss of sensation is particularly important because injuries may occur that are not noticed, resulting in lack of treatment, leading to infections and amputations.

Hence it is very important for the health care provider to frequently assess the patient with diabetes for signs and symptoms of neuropathy, as the complications such as an infection that requires amputation can be prevented.

Proposed Pathophysiology of Diabetic Peripheral Neuropathy

Because of hyperglycemia of diabetes, every tissue and organ of the body undergoes bio-chemical and structural alterations which account for the major complications in diabetes. The following two biochemical mechanisms have been implicated in the development of most complications of diabetes¹⁰:

Non-Enzymatic Glycosylation

This refers to the process by which glucose chemically attaches to the amino groups of proteins by non-enzymatic mechanism i.e., without the aid of enzymes and causes chemical alterations in the involved tissue protein and is called glycosylation. This glycosylation is directly related to the level of blood glucose. An example of this mechanism is the measurement of glycosylated hemoglobin (HbA1c) as a test for monitoring control of diabetes in a diabetic patient. This accumulation of glycosylation products on collagen and other tissues of blood vessel walls causes thickening of the basement membrane. Similar type of basement membrane thickening is seen in non-vascular tissues such as peripheral nerves, renal tubules, Bowman's capsule etc. In essence, the blood flow to the nerves is limited, leaving the nerves without blood flow and they get damaged as a result. In humans it has been shown that the glycosylation end products accumulate at a faster rate in arteries in diabetics than in control subjects.

Intracellular Hyperglycemia

In some tissues ex. nerves, lens, kidney, and blood vessels that do not require insulin for glucose transport, hyperglycemia leads to an increase in intracellular glucose. The excess glucose is metabolized into chemical by products called sorbitol and fructose by the enzyme aldose reductase. This sorbitol accumulation is associated with a deficiency in myo-inositol content (a member of Vit. B complex) inside the cell which promotes injury to Schwann cells with resultant peripheral neuropathy. Three types of basic pathological changes or nerve damage may take place:

1. Segmental Demyelination
2. Axonal Degeneration
3. Schwann cell injury

CONCLUSION

Prameha / Madhumeha is one among the Ashta Mahagadas, owing to its grave nature with regards to non-response/delayed response to the treatment adopted. Madhumeha being a vataja prameha is said to be asadhyta and manifests in two conditions- Maragavarodha and Dhatu kshaya, in both the conditions vata prakopa is responsible for its manifestation. Upadrava is nothing but a vyadhi, occurring after the complete manifestation of Pradhana vyadhi. Dosha which is responsible for the manifestation of Pradhana vyadhi is itself involved in the establishment of that upadrava. Similarly, an improperly managed Madhumeha Rogi may land up with Upadravas involving various dhatus owing to dhatu kshaya and vata prakopa. Thus, a Madhumeha Rogi may develop twak gata vata lakshanas viz, rukshata, sputana, suptata, krishata, krishta, toda, vaivarnya, chumachumayana, daha, etc. as Upadrava Swarupa. These manifest first in the Ubbaya pada due to rasayani daurbalya in a Madhumehi. Tiryakgata dhamanis, mentioned by Acharya Sushruta which end in the romakupas, attributed with pleasant and unpleasant tactile sensations can be correlated to the receptors in the skin for touch, temperature, pain, pressure, etc.

In Diabetic peripheral neuropathy, nerves get damaged because of Schwann cell injury and demyelination, due to intracellular hyperglycemia and thickening of the arterioles supplying the nerve fibers. As a result of this damage the patient experiences burning and tingling sensations, aching pain, numbness, etc. which simulate with twak gata vata lakshanas.

DPN or Diabetic peripheral neuropathy can be understood as Madhumeha janya twak-gata vata. It is a type of vata vyadhi characterized by twak rukshata (dryness), sputana (cracks), suptata (numbness), krishata, toda (pricking pain), bheda (aching pain) chumachumayana (tingling sensation), vaivarnya (discolouration) and daha (burning sensation) which simulate with the features of DSPN. Daha (burning sensation) as a lakshana of twak gata vata has not been mentioned by any of the Brihatrayees. It is mentioned in Basavarajeeyam. It is seen when there is anubandha of pitta with vata.

REFERENCES

1. Pop-Busui R, Boulton AJ, Feldman EL, *et al.* Diabetic neuropathy: a position statement by the American Diabetes Association. *Diabetes Care* 2017; 40: 136–154 (27/06/2021)
2. Agnivesha, Charaka Samhita, Chikitsa Sthana 28/18, (Text with English translation by Vaidya Bhagavan Das based on Chakrapani Datta's Ayurveda Dipika) 5th edition, Varanasi, Chaukhambha Orientalia; 1997.
3. Agnivesha, Charaka Samhita Chikitsa Sthana 28/15, (Text with English translation by Vaidya Bhagavan Das based on Chakrapani Datta's Ayurveda Dipika) 5th edition, Varanasi, Chaukhambha Orientalia; 1997.
4. Sushruta acharya, Sushruta Samhita Nidana Sthana 1/35, (Text with Nibandha Sangraha commentary of Sri Dalhanacharya) Varanasi, Chaukhambha Orientalia; 1997.
5. Vaidya Shree Basavaraja, Basavarajeeyam, Vatavyadhi Adhyaya 6/108, (Text with English Translation, Notes and Appendices), Varanasi, Chaukhambha Orientalia; 2019.
6. Sushruta acharya, Sushruta Samhita, Chikitsa Sthana. 12/8, (Text with Nibandha Sangraha commentary of Sri Dalhanacharya) Varanasi, Chaukhambha Orientalia; 1997.
7. Vagbhata acharya Ashtanga Hridya, Nidana Sthana with Sarvanga-Sundari commentary, (Hindi translation by Sri Lalchandra Vaidya), 1st edition, Varanasi – Motilal Banarasidas publishers; 1990.
8. Sushruta acharya, Sushruta Samhita, Sutra Sthana, 24/11 with Nibandha Sangraha commentary of Sri Dalhanacharya, Varanasi, Chaukhambha Orientalia; 1997.
9. Robins Stanley L, Vinay Kumar, Basic Pathology, 4th edition, WB Saunders Company; 1992. p. 752.
10. Cotran, Kumar, Robbins, Robbins Pathological basis of diseases, 5th edition, Saunders; 1990. p. 854.

Cite this article as:

Karishma. A Critical Review on Madhumeha Janya Twak-Gata Vata with special reference to Diabetic Peripheral Neuritis. *Int. J. Res. Ayurveda Pharm.* 2021;12(4):124-127 <http://dx.doi.org/10.7897/2277-4343.1204119>

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: IJRAP is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publishing quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJRAP cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of IJRAP editor or editorial board members.