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Ayurvedic and modern approach to Diabetic Neuropathy : A Review

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ABSTRACT

In Ayurveda, Diabetes mellitus closely resembles a disorder called *Madhumeha*, which is a subtype of *Vataja Prameha*. In *Avaranjanya Madhumeha* vitiated *Kapha*, *Pitta* and *Meda* causes *Avarana* to *Vata* that leads its aggravation causing diminution of vital *Dhatus*. This may lead to the complication of *Madhumeha* such as Diabetic Neuropathy. Neuropathy is a common complication of diabetes affecting approximately 30% of diabetic patients. Diabetic neuropathies are thought to result from diabetic micro vascular injury involving small blood vessels that supply nerves in addition to macro vascular conditions that can culminate in diabetic neuropathy. Although the invention of insulin and hypoglycemics have done a great service for diabetics, yet these patients do not get a proper solution for their neuropathic complications. The most common signs found in diabetic sensory polyneuropathy are diminished perception of vibration sensation and impairment of all other modalities of sensations. As per Ayurvedic principles there is involvement of *Vata* and *Pitta Dosa* in diabetic neuropathy. In Ayurvedic classics symptoms like *Suptata* (numbness) and *Daha* (burning sensation) in body parts especially in hands and feet are described as *Purvarupa* of *Prameha*. *Daha* is also described among the *Upadravas* (complications) of *Prameha*. These are very common features of diabetic neuropathy. As we know that diabetic neuropathy is common complication amongst diabetics. In conventional medicine tricyclic antidepressants, anticonvulsants, opiates, membrane stabilizers and antioxidants are used in diabetic peripheral polyneuropathy for symptomatic relief. All these drugs have their side effects. Hence there is need to find out safer and effective treatment from the sources other than conventional medicine.

Key words: Diabetic neuropathy, Diabetes Mellitus, Prameha Upadrava, Madhumeha.

INTRODUCTION

Uncontrolled chronic hyperglycemic condition can cause damaging effects on organs such as heart, kidney, eye, and nerve leading to vascular complications. Diabetic neuropathy (DN) is one of the

common microvascular complications affecting the majority diabetic population worldwide. DN is characterized by degenerative neuronal loss due to alterations in nerve damage and repair process which result in progressive loss of sensation. The prevalence of diabetic peripheral neuropathy (DPN) ranges from 16 to 87% with painful diabetes-related neuropathy about 26%. The lower limb amputation is 10–20-fold more common in diabetic patients as compared to non-diabetic patients. Significant neuropathic pain occurs in 7.5% to 24% of all patients with diabetes.^[1] Chronic hyperglycaemia contributes to pathological changes like demyelination of nerves, narrowing of neuronal capillary, axonal thickening, neuronal damage, and loss of nerve fibers). The neuronal damage can be attributed to elevated levels of oxidative stress and advanced glycation end products (AGEs) in nerves. Depending on the affected nerves,

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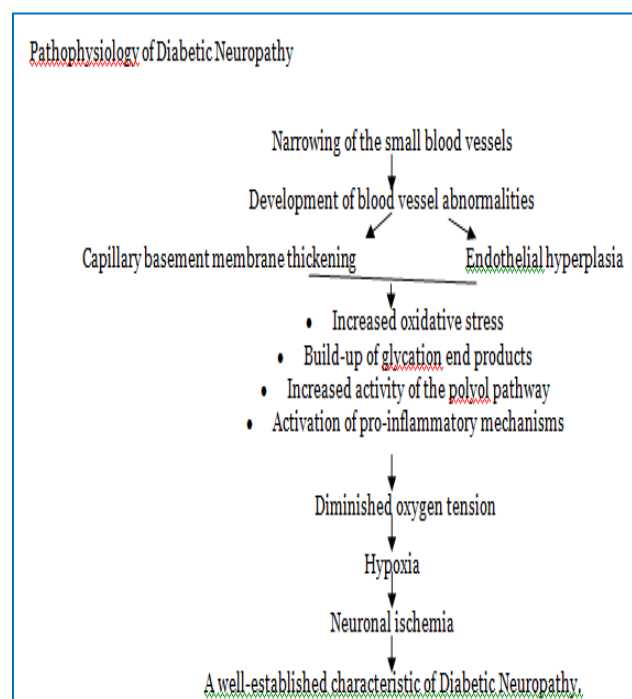
symptoms of diabetic neuropathy can range from pain and numbness in your legs and feet to problems with your digestive system, urinary tract, blood vessels and heart. Some people have mild symptoms. But for others, diabetic neuropathy can be quite painful and disabling.^[2]

The disease *Prameha* can be understood as having three stages based on the severity of *Dhatudusti* and *Kaphaja*, *Pittaja* and *Vataja Lakshanas* are manifested in the I, II and III stages respectively. *Prameha Upadravas* are manifested only in the terminal stage i.e., with the *Dusti* of all *Dhatus*. Neuropathy analyser machine has been used for exact recording of sensory perception of vibration, cold and hot sensations which costs around several thousands. Many single drugs and Ayurvedic formulations are used in practice have significant effect on the symptoms of numbness, tingling, burning sensation and pain in the patients of diabetic neuropathy.

AIMS AND OBJECTIVES

1. To study the literature regarding the diabetic neuropathy through Modern & Ayurveda
2. To study the treatment modalities in diabetic neuropathy as per Ayurvedic view.

Modern View^[3]



Symptoms^[4]

There are four main types of diabetic neuropathy. Symptoms will depend on the type & which nerves are affected. Usually, symptoms develop gradually.

Peripheral Neuropathy

This is distal symmetric peripheral neuropathy. It's the most common type. It affects the feet and legs first, followed by the hands and arms. Signs and symptoms of peripheral neuropathy are often worse at night, and may include:

- Numbness or reduced ability to feel pain or temperature changes
- Tingling or burning sensation
- Sharp pains or cramps
- Increased sensitivity to touch
- Serious foot problems, such as ulcers, infections, and bone and joint pain

Autonomic Neuropathy

The autonomic nervous system controls your heart, bladder, stomach, intestines, sex organs and eyes. Diabetes can affect nerves in any of these areas, possibly causing:

- A lack of awareness that blood sugar levels are low (hypoglycemia unawareness)
- Bladder or bowel problems
- Slow stomach emptying (gastroparesis), causing nausea, vomiting and loss of appetite
- Changes in the way your eyes adjust from light to dark
- Decreased sexual response

Proximal Neuropathy (Diabetic Radiculopathy)

This is diabetic amyotrophy - often affects nerves in the thighs, hips, buttocks or legs. It can also affect the abdominal and chest area. Symptoms are usually on one side of the body, but may spread to the other side. You may have

- Severe pain in a hip and thigh or buttock

- Eventual weak and shrinking thigh muscles
- Difficulty rising from a sitting position
- Severe stomach pain

Mononeuropathy (Focal Neuropathy)

There are two types of mononeuropathy - cranial and peripheral. Mononeuropathy damage to a specific nerve. May also lead to:

- Difficulty focusing or double vision
- Aching behind one eye
- Bell's palsy
- Numbness or tingling in your hand or fingers, except your pinkie (little finger)
- Weakness in your hand that may cause you to drop things.

Investigation of Diabetic Neuropathy^[5]

Neuropathy is diagnosed on the basis of symptoms and a physical examination. During the examination, blood pressure and heart rate, muscle strength, reflexes and sensitivity to position, vibration, temperature or a light touch is checked. The doctor also does other tests to determine the type & extent of nerve damage.

1. Comprehensive Foot Exam
2. Electromyography (EMG)
3. Quantitative Sensory Testing (QST)
4. A check of Heart Rate Variability
5. Ultrasound
6. Nerve Conduction Study

Samprapti Ghatak of Diabetes Neuropathy

- *Doshas - Vata (mainly), Kapha Pitta.*
- *Dooshyas - Rakta, Twak, Mamsa (main), Meda, Vasa, Rasa, Ambu Lasika, Majja, Shukra, Ojas*
- *Agni - Dhatvagni Mandhyata*
- *Srotas - Raktavaha (mainly) Medavaha Mamsavaha, Rasavaha Majjavaha, Shukravaha*
- *Srotodusti - Sanga and Vimarga Gamana*

- *Udbhava Sthana - Hasta, Pada*
- *Sanchara Sthana - Sira, Dhamani*
- *Adhistana – Raktavaha (mainly), Medovaha Srotas including Vapavahana*
- *Vyakta Sthana - Hasta-Pada Daha, Kriya-Alpata, Hasta-Pada Chimchimayan*

Ayurvedic View

The disease diabetic neuropathy cannot be directly correlated with any *Vyadhi* of Ayurveda. But similar *Lakshana* are present in *Purvaroop*a and complication of *Prameha*. In diabetic neuropathy, mainly lancinating pain, burning sensation, tingling sensation and numbness in hands and feet are the symptoms.

Symptoms of diabetic neuropathy include;

1. **Ruja:** The word pain signifies 'Ruk'. Any kind of pain is always associated with *Vayu*.^[7] It is included under *Vataprakopaka Lakshanas* by *Astanga Hridaya*, the word pain signifies 'Ruk'. Any kind of pain is always associated with *Vayu*. It is included under *Vataprakopaka Lakshanas* by *Astanga Hridaya*.
2. **Daha:** The word burning means *Daha*. *Daha* is felling like burn from fire. Any type of *Daha* always associated with *Pitta*, here *Padadaha* is due to *Ashyapakarsha* of *Pitta* by *Vata*.
3. **Harsha:** *Harsha* is included in *Vata Nanatmaja Roga*.^[8] *Jhanjhanaya* or *Chimchimayan* means tingling or clanking. Here *Chala Guna* of *Vata* is responsible for *Harsha*. *Jhanjhanaya* also described in *Vatavyadhi Cikitsa in Chakardatta*.
4. **Supti:** *Supti* means numbness. *Supti* is a symptom of *Snayu Sira Kanḍra Dushti*.^[9] *Supti* is described in *Vata Nanatmaja Roga*.

In Ayurvedic classics symptoms like *Suptata* (numbness) and *Daha* (burning sensation) in body parts especially in hands and feet are described as *Purvarupa* of *Prameha*.^[10] These symptoms are present in complication of *Prameha*.

Similarities of Diabetes Neuropathy and Vatarakta^[6]

Symptoms and *Samprapti* (pathogenesis) & complications of *Vatarakta* has nearly resemblance with symptoms and pathogenesis of diabetic neuropathy. Etiological factors, prodromal symptoms and complications of *Prameha* and *Vatarakta* are also nearly same. Excessive use of *Katu* (pungent) and *Tikta* (bitter) *Rasa*, excessive walking, excessive exercises to treat *Madhumeha* (DM-2) [a type of *Prameha*] may lead to pathogenesis of *Vatarakta*. Micro and macro vascular changes and neuronal ischemia are the main pathology in diabetic neuropathy which are similar the *Raktadusti* (vitiation of blood) and *Vatadusti* (vitiation of *Vata*) of *Vatarakta*.

Treatment View

Nidana Parivarjana is the main *Chikitsa* of every disease, *Shamsodhana*, *Shamshamana*. All Ayurvedic *Acharyas* explained about *Nidana Parivarjana*, as *Kaphavardhaka Ahara Vihara* should be avoided i.e., *Madhura*, *Sheeta*, *Snigha*, *Guru Ahara* etc. Activities like lack of exercise, laziness and sedentary habits must be avoided.^[11] In *Panchakarma* purification of the body leads to maintaining their equilibrium.

Initially *Mridu Snehana* is done followed by the *Shalishastika Pinda Swedana*. Then *Samshodhana* is done by *Vamana*, *Virechana*.^[12] *Nasya*, *Basti*, *Shastika Pinda Sweda*, *Patrapinda Sweda* is useful in treatment of diabetic neuropathy. Ayurvedic antidiabetic formulation along with *Tridosha Shamaka* herbs specially *Vatashamaka*, *Shothahara* property due to its diuretic nature, *Nadibalya* (Nervine), *Vedana Sthapaka* useful in the state of Diabetic Neuropathy. *Bala*, *Atibala*, *Ashwagandha*, *Tila Taila* has emollient, nourishing property and may act by its myelin sheath repair property and nourishes the *Snayu* and improves its actions. All these drugs have the property of *Vatanashaka* and may improves the myelin sheath repair property and the nerve conduction velocity which as a result in overall improvement in the total health especially Neurological health of patients of Diabetic Neuropathy.

Basti can break pathogenesis of *Vata Vyadhi* by removing *Margavarodha* by purification of channels and *Dhatukshaya* by its *Brihmana* (~nourishing)

property. *Basti* used in the case was mainly made of *Tikta Rasa* and *Madhura Rasa*. *Mahapanchatikta Ghrita* and *Ashwagandha Taila* (oil) were used in the formation of *Basti*.^[13,14] *Tikta Rasa* is used in the treatment of *Rakta Dosha* and *Raktavaha Srotodusti* (pathogenesis in blood vessels). *Tikta Rasa* has *Shothaghana* (anti-edematous and anti-inflammatory) and *Pittahara* properties (suppression and elimination of deranged *Pitta Dosha*). *Ghrita* and honey have *Madhura Rasa* (sweet taste) dominance. The combinations of these drugs may act as *Vata Pittahara* (suppressors and eliminators of deranged *Vata* and *Pitta Doshas*) that may reduce inflammation and treat the Diabetic neuropathy condition. Hence *Basti* used in the case was effective for the treatment of diabetic neuropathy. *Rasayana Aswagandha* has (immunomodulatory) and *Balya* (anabolic) properties.^[15]

Udvartana

In the pathogenesis of *Prameha*, it is mentioned that due to the *Bahu Drava Sleshma* (~excess moisture content), the *Sthirata* (~compactness) of the muscles of the body is lost. As *Udvartana* is a procedure that decreases *Kapha* liquefaction of *Medas* imparts *Sthirata* to the body and helps in *Tvak Prasadana*^[16] (~stimulates the skin by increasing the peripheral circulation), which was preferred. In this case, *Udvartana* is aimed at providing the initial *Langhana* and sensitization of the skin by increasing the circulation. *Triphala churna*,^[17] *Triphala* + *Liqorice*, *Kolkulathadi Churna*, *Nisha Amalaki Churna* can be used.

Abhyanga

After the initial *Rookshana* by *Udvartana*, *Abhyanga* should be done with oil which is *Vatahara* and also indicated in *Prameha*.^[19] This process alleviates *Vata* and improves the sensory perception of the skin as *Vayu* dominates the tactile sensory organ located in the skin. e.g., *Vatasini* oil^[18], *Ksheerbala* oil, *Fish oil*, *Seal Oil*.

DISCUSSION

Diabetic neuropathy is damage to autonomic, motor and / or sensory nerves that results from metabolic or

vascular derangements in patients with long standing diabetes mellitus. Symptoms of the disease like pain (*Ruka*), tingling sensation (*Harsha*) and numbness (*Supti*) are due to vitiation of *Vata Dosha*. Burning (*Daha*) sensation is due to provocation of *Pitta Dosha*. Drugs having *Rasayana*, *Madhumehahara* property and *Balya* property is useful in the treatment of diabetic neuropathy. The combined Ayurvedic treatment protocol of oral drugs and external therapies were found to be effective in the management of sensory as well as motor symptoms of DPN. Concomitant use of Ayurvedic treatments and internal medications can be effective in the treatment of DPN; further use of suitable *Rasayana* drugs may arrest the disease progression also.

Pathya and Apathya^[20]

Shyama, *Kodrava*, *Uddalika*, *Godhum*, *Chanaka*, *Aadak* and *Kullatha* which are old - are suitable to be used as foods by patients of *Madhumeha* (Diabetes). Vegetables of bitter taste (*Tikta*), meat of animals and eggs of birds of deserts like regions (*Jangala mamsa*), boiled *Yava* and its preparations, *Mudag*, *Shali*, and *Shastika* are all suitable as foods. *Shauviraka* (fermented gruel), *Sura* (beer), Buttermilk, oils, milk ghee, jaggery, foods processed with sours, sugarcane, juice, food prepared from flour, meat of animals of marshy regions should be avoided from use.

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