

ANALYTICAL UNDERSTANDING OF ETIOPATHOGENESIS AND INTERVENTION
MODALITYS OF DIABETIC NEUROPATHY VIS-A-VIS MADHUMEHA UPADRAVA

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ABSTRACT

Lifestyle changes due to urbanization and modernization have caused unhealthy diet habits, lack of physical activity, and increased stress leading to lifestyle diseases evolved as a negative effect of it. Among them Diabetes Mellitus is one and prime. Diabetic neuropathy closely resembles a disorder called upadrava of *Madhumeha* in ayurvedic literature. Nerves due to diabetes get affected, especially the peripheral nerves leading to diabetic neuropathy. In *Avarnjanya Madhumeha* vitiated *Kapha*, *Pitta* and *Meda* causes *Avarana* to *Vata* that leads its aggravation causing diminution of vital *Dhatu*. This may lead to the complication of *Madhumeha upadrava* such as Diabetic Neuropathy. According to Ayurvedic principles there is involvement of *Vata* and *Pitta Dosha* dominantly in diabetic neuropathy. Diabetic neuropathy is a relatively early and common complication affecting approximately 30% of diabetic patients. The interventions practicing conventionally are mostly for relief in the symptoms and moreover they have certain ill effects. Many intervention modalities and Ayurvedic formulations are used in practice, have significant effect on controlling blood sugar level the symptoms of numbness, tingling, burning sensation and pain in the patients of diabetic neuropathy are relieved satisfactorily and lead good quality of life.

KEYWORDS: Diabetic Neuropathy, Madumeha, Upadrava.

INTRODUCTION

Diabetes mellitus is a group of metabolic disorder involving carbohydrate, lipid and protein metabolism, characterized by chronic hyperglycemia, as a result of defects in insulin secretion from the β -cells of pancreas or peripheral action of insulin (insulin resistance) or both. During the course of the disease the diabetic subjects are at risk of development of micro vascular (retinopathy, nephropathy, neuropathy) and macro vascular (coronary artery, cerebrovascular and peripheral vascular disease) complications later in the course of the disease. The features of long term complications then become a part of the diabetic phenotype.^[1]

At least 171 million people worldwide have diabetes this figure is likely to be more than double by 2030. Current prevalence rates are 19 % in the urban Indian adult population.

Diabetic neuropathy (DN) is defined as the presence of symptoms and signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes.

Management and Prognosis of Diabetic Peripheral Neuropathy depend largely on the underlying condition. Currently, no medication^[2] has been shown to reverse Neuropathy. Treating the diabetes may halt progression and improve symptoms of neuropathy but recovery is

slow. Treatments aimed at interrupting these pathological processes have been limited by side effects and lack of efficacy.

OBJECTIVES

1. To study the literature regarding the diabetic neuropathy through modern medicine as well as Ayurveda point of view.
2. To study the Ayurvedic treatment modalities in of diabetic neuropathy

CAUSES OF DIABETIC NEUROPATHY

- Metabolic factor: high blood glucose, long duration of diabetes, abnormal blood fat levels & possibly low levels of insulin.
- Neurovascular factor: leading to damage to the blood vessels that carry oxygen & nutrients to nerves.
- Autoimmune factor that causes inflammation in nerves.
- Mechanical injury to nerves such as carpal tunnel syndrome.
- Inherited traits: that increases susceptibility to nerve disease.
- Lifestyle factors: such as smoking or alcohol or drug abuse.

TYPES

- Peripheral neuropathy
- Autonomic neuropathy
- Proximal neuropathy
- Focal neuropathy

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

1) Peripheral neuropathy

Peripheral neuropathy is the most common type of diabetic neuropathy. 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 - for some people, even the weight of a bed sheet can be painful,
- Muscle weakness, Loss of reflexes,
- Especially in the ankle, Loss of balance and coordination.^[3]

2) Autonomic neuropathy

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

- Bladder problems, including urinary tract infections or urinary retention or incontinence,
- Constipation, uncontrolled diarrhea or both, Slow stomach emptying (gastro paresis), causing nausea, vomiting, bloating and loss of appetite,
- Difficulty swallowing.
- Increased or decreased perspiring.
- Difficulties controlling body temperature.
- Tachycardia at rest.
- Decreased libido.

3) Proximal neuropathy (diabetic amyotrophy).

- Proximal neuropathy affects nerves in the thighs, hips, buttocks or legs. It's more common in people with type 2 diabetes and older adults.

- Severe pain in a hip and thigh or buttock that occurs in a day or more.
- Eventual weak and shrinking thigh muscles.
- Difficulty rising from a sitting position.
- Abdominal swelling, if the abdomen is affected
- Weight loss

4) Mononeuropathy

Mononeuropathy, or focal neuropathy, is damage to a specific nerve in the face, middle of the body (torso) or leg. It's most common in older adults.

Pain in the: Shin or foot, Lower back or pelvis, Front of thigh, Chest or abdomen.

Investigation of Diabetic neuropathy Neuropathy is diagnosed on the basis of symptoms and a physical examination. During the examination, the doctor may check blood pressure and heart rate, muscle strength, reflexes and sensitivity to position, vibration, temperature or a light touch. The doctor may also do other tests to help determine the type and extent of nerve damage.^[4]

The disease Diabetic Neuropathy is not directly mentioned in Ayurvedic texts. Diabetic Neuropathy is a sequel to *Madhumeha* which occurs due to further vitiation of the *Doshas* or due to *Vyadhi karshana*. But the *lakshanas* of Diabetic Neuropathy i.e. burning sensation, tingling sensation, numbness etc. are explained under *purvaroop* and *upadrava of Prameha*. Further *lakshanas* like Pada supti, Padaharsha are dealt under *Vataja nanatmaja vikaras*. The present condition is nothing but a manifestation of *majja dushti* causing demyelination of nerve fibers due to *microvasculopathy* and hyperglycemic insult to nerves. The concept of *Avarana Vata* helps in understanding the condition better. These can be correlated to Diabetic Peripheral Neuropathy as told in modern system of medicine.

Hence the approach towards Diabetic Neuropathy will follow the line recommended for *Avarana Vata Chikitsa*. The target is use of *Anabhishtyandi dravyas* dominated by *Snigdha guna* which act as *Vata shamana*, *Kapha Pitta avirodhi* and *Srotoshodhana*. If the drug possesses *Rasayana* property, it will be an added advantage.

Sensory symptoms of neuropathy	
Numbness	<i>Supti- Prameha purvarup.</i> <i>Khara supti- vataja nanatmaja vikara.</i> <i>Pada supti- kapha karma.</i> <i>Anga supti – twakgata vata.</i>
Burning sensation	<i>Daaham – prameha purvarup.)</i> <i>Vidaha – pitta nanatmaja vikara.</i>
Tingling sensation	<i>Harsha – twakgata vata.</i> <i>Pippalika sancharam- Kapahavrita udana.</i> } <i>Harsha</i> <i>Pippalika sancharam mamsavrita vata.</i>

Pin & needle's sensation	<i>Suchibhirava nistodam – shonitavrita vata, asthiavrita vata.</i>
Motor symptoms of neuropathy	
Wasting	<i>Shosha – prameha upadrava. Mamsopachaya – prameha upadrav.)</i>
Weakness	<i>Daurbalya- prameha upadrava. Sihambha – prameha upadrava.</i>
Involuntary movements	<i>Kampa – prameha upadrava.</i>

INVESTIGATIONS

1. Random Blood Sugar.
2. Electromyography (EMG).
3. Vitamin B12
4. HbA1C
5. TFT (Thyroid function test)
6. Nerve Conduction Study (NCS)^[5]

AYURVEDIC PERSPECTIVE OF SAMPRAPTI

The functions of nervous system are mainly attributed to *vata dosha*. Diabetic neuropathy is considered as a *upadrava* of *madhumeha* and analyzed under *vikara prakruthi*, *samuttana vishesha* and *adhistana*. Where involvement of *tridosha* and *dushya* like *rasa*, *rakta*, *mamsa*, *meda*, *majja*, *shukra* & *ojas* and involvement of *jataragni bhutagni* & *dhatwagni*.

The vitiated *kapha*, *pitta*, *medas*, *rakta*, *mamsa* causes *avarana* of *vata*. The *chalatva* will be *diminished* due to obstruction. This causes either *chesta haani* or *vimarga gamana* of *vata*. There will be *pornata* of the *srotas* & *dhatu's* will be in *vridhdha* or *samavasta*. It can cause loss of motor or sensory functions done by *vata dosha* such as *paresthesia* etc., according *anubanda* of various *dosha* and *dushya* it produces different symptoms. In *kapha anubanda*, symptoms like *Supti*, *Gouravam Shaitiyata*. In *piita anubanda* *Daha*, *Toda* are seen.^[6]

MANAGEMENT

Nidana Parivarjana is the main *Chikitsa* of Metabolic disease, *Shamsodhana*, *Samshamana*. All *Ayurvedic Acharyas* explained about *Nidana Parivarjana* as *Kaphavardhaka Ahara Vihara* should be avoided *Ayurvedic antidiabetic formulation* along with *Tridosha Shamaka* herbs specially *Vatashamaka*, *Shothahara* property due to its diuretic nature,^[7] *Nadibalya* (Nervine), *Vedana Sthapaka* useful in the state of Diabetic Neuropathy.

Neuropathy is a condition where there is gross impairment of functions & structures of *dhatu* which involve *bahu dosha avastha*. In such condition, first the *agni* should be corrected, then *prakupita dosha avastha* should be corrected. Since *dhatu's* have a passive role in *samprapthi*^[8], when the *dosha dushti shamana* occurs *dhatu dushti* will be corrected.

But, in *anushangi vyadhi* like *madhumeha* and its complications, the vicious cycle of *dosha dhatu dushti* is never ending. In such cases the attainment of *dosha dhatu* is not that easy. Hence, long term treatment is needed in diabetic neuropathy, when symptoms such as

burning sensation are present treatment for *pittavrita vata* should be given. When symptoms such as numbness is present *kapha vrita vata* treatment should be given. *Kapha vrita vata* symptoms like *supti* is noticed then *katu rasa*, *ushna virya*, *kapha vatahara* & *avarana*, *supti nashana* type of drugs are used.^[9]

TREATMENT PRINCIPLES CAN BE USED IN DIABETIC NEUROPATHY

Udwartana: *Triphala churna*, *Argwadadhi churna*, *Eladi churna* by *udwartana kapha* & *meda* will be pacified provides *drudata* in the body & gives *twak prasadhana* and also it improves peripheral circulation & sensory perception.

Dhanyamla dhara: acts as *daha prashmana sparsha sheetam antar ushna*.

Lekhana basthi: *Maadutailika basti*, *Nyogradigana kashaya*, *panchatiktaka kashya basthi* useful.

SHAMANA FORMULATION

- **Kashaya:** *Astavarga kashaya*, *lashunadi kashaya*, *asanadi kashaya*, *shuntibaladi kashaya*, *bhunimbadi kashaya* in later stage *shunti dravya ksheer kashaya*.^[10]
- **Churna kalpana** -*Gudguchi satvam*.^[11]
- **Gulika** -*Vasanata kusumakara rasa*.^[12]
- **Taila kalpana** (Internal & external use) : *Jeerna pinyaka taila* is *kapha vatahara ruksha kara*, in *pittanubhandha* conditions improves the cutaneous circulation. It controls diabetes.^[13]
- **Rasayana:** like *Shiva gulika*, *vardhmana pippali prayoga*, *vasanta kusumakara* are used as *rasayana*.

DISCUSSION

Diabetic neuropathy is having *Tridosha Dushti* along with *Agnimandya* and *Amotpatti* which further cause *Dushti of Rasa* and *Majja Dhatu* because of same qualities. Excessive intake of *Amla*, *Lavana*, *Katu*, *Ushna*, *Tiksna Ahara* causes *Pitta Prakopa*, *Raktadushti* and *Shitilatha* of *Dhatu's*. In *Vataja Prameha* this vitiated *Vayu* starts spreading in various parts of body and produces the features of Diabetic Neuropathy. Since vitiated *Vata* goes to *Tvacha*, *Vitiated Vata* produces features like tingling, twitching, pricking or incising pain in skin, dryness of skin, abnormal pigmentation, numbness.^[14]

Vitiated *Vata* is also responsible for *Parishoshana* (decrease) of *Tarpaka Kapha* which further leads to decrease of *Snayugata Kapha* (*Sneha*). We know that

Tarpaka Kapha provides nutrition (*Tarpana*) of *Indriyas*. So due to decrease in *Tarpaka Kapha* the nutrition of *Indriyas* (sensory and motor organs) are decreased.^[15] This leads to decrease in the functions of *Indriyas* (both *Karmendriyas* and *Gyanendriyas*).^[16] Due to vitiation of *Pitta* goes to *Twacha* and produce burning sensation, warmth of skin, faintness, giddiness etc. Ultimately from *Twacha*, these two *Dosha* further spread and affect the *Snayus* (nerves). As a result, *Snayushota* occurs which is manifested as *MonoNeuropathy*. *Mono-Neuropathy* multiplex and *PolyNeuropathy* etc. *Diabetic Neuropathy* as a *Tridoshaja Vyadhi* in which *Vata Prakopa* is the chief factor which occurs due to *Dhatukshaya*, *Ojokshaya* and *Ruksha Ahara-Vihara* and which results ultimately in *Madhumehajanya Snayusotha* and produces entire features of *Diabetic Neuropathy*.^[12]

Hence the approach towards *Diabetic Neuropathy* will follow the line recommended for *Avarana Vata Chikitsa*.^[17] The target is use of *Anabhishtyandi dravyas* dominated by *Snigdha guna* which act as *Vata shamana*, *Kapha Pitta avirodhi* and *Srotoshodhana*. If the drug possesses *Rasayana* property, it will be an added advantage.^[18]

CONCLUSION

Diabetic neuropathy is damage to autonomic, motor and / or sensory nerves that results from metabolic syndrome or vasculopathy in patients suffering from long standing diabetes mellitus. The disease *diabetic neuropathy* cannot be directly correlated with any *prameha upadrava* in *Ayurveda*. 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*.

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