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Rationality of using Ayurvedic interventions in Diabetic Neuropathy in Geriatric age group

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ABSTRACT

Diabetic Neuropathy is a damaging of Nervous system associated with Diabetes Mellitus. It occurs due to microvascular injury involving small blood vessels in addition to macrovascular conditions with a prevalence rate of almost 50% in individual with long standing type 1 and type2 Diabetes.^[1] Symptoms may include tingling sensation, numbness, burning that starts from feet and spreads proximally etc. In Ayurveda there is no direct reference of Diabetic Neuropathy but it is mentioned as a symptom and complication of Prameha. Hence the most important thing is to be done in Diabetic Neuropathy is to maintain the blood sugar level to normal limits with proper medication, diet, and adequate physical exercises. This review article is to enlighten what ayurvedic interventions including dietary regimen (*Ahara*), medications (*Aushadha*) and purificatory method (*Shamsodhana*) has been used in *Prameha* to control and prevent its further complications.

Key words: Diabetic neuropathy, Vatavyadhi, Prameha, Samsodhana, Sanshamana

INTRODUCTION

Diabetes Mellitus (DM) is a multifactorial metabolic disorder affecting millions of people all over the world. It is one of the most important medical problems of today because world-wide > 246 million people suffer from Diabetes mellitus all over the world. By 2025 this figure could be expected to be 380 million. Diabetes as such does not kill the patient but it is the complications of diabetes that are responsible for mortality and Morbidity.^[2] Diabetic Neuropathy is one of the commonest complications associated with Diabetes

mellitus which occurs in almost 50% of individuals with long standing type1 and type 2 DM, manifests as a diffuse neuropathy (distal symmetrical polyneuropathy or/and autonomic neuropathy), a mononeuropathy, or a polyradiculopathy. Symptoms may include a sensation of numbness, tingling sensation, sharpness, or burning that begins in the feet and spreads proximally. Hyperesthesia, paraesthesia, and dysesthesia also may occur. Hyperglycaemia associated with diabetes a thought to be central to the effect on nerve structure through a number of possible mechanisms including increased activity in polyol pathway, altered myo- inositol metabolism and non-Enzymatic glycation. Other mechanism may also be involved e.g. alterations in nerve growth factor activity, blood viscosity, circulating platelets and the rate of synthesis and transport of intraaxonal protein.

Diabetic neuropathy is not directly mentioned in *Ayurvedic* texts but the *Lakshanas* of Diabetic neuropathy i.e., *Daha* (burning sensation), *Chimchimayana* (tingling sensation), *Susuptta* (numbness) are explained under *Poorvaroopa* (Prodromal symptoms) and *Upadrava* (Complications) of *Prameha*. When *Prameha* is neglected or illtreated it

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will lead to *Madhumeha* by *Dhatukshayajanya Vata Prakopa* as a *Pratantra Vyadhi* (Secondary disease).

Diabetic neuropathy can be correlated to *Vatavyadhi* particularly *Vyana Vayu* is vitiated in case of neuropathy because *Vyana Vayu* is responsible for regulating circulation and movement throughout the body. It is responsible for co-ordination of movement, sensation and communication between brain and peripheral tissues including organ, muscle and tissues. Vitiating *Vata* Symptoms include *Gatrasuptata* (numbness), *Toda* (excruciating pain) and *Hasta Padatala Daha* (burning sensation of hand, feet and soles) symptoms of *Pitta*. Hence drugs pacifying *Vata* and *Pitta Doshas* are useful in treatment of Diabetic Neuropathy. In Ayurveda by giving comprehensive attention to four aspects which are *Nidana Parivarjan*, *Ahara* (diet), *Vihara* (exercise), and *Aushadha* (medicine) blood sugar level can be easily controlled to prevent its further complications.

Treatment Modalities for Diabetic Neuropathy-

1. **Nidana Parivarjana** - *Nidana Parivarjana* means avoidance of etiological factors which help in preventing the disease or control disease in an individual. Acharya Sushruta give importance to a *Siddhant* by mentioning "*Sankshepatah Kriyayoge Nidan Parivarjanam*" means *Nidana Parivarjana* is one of type of treatment. Etiological factors describe by acharyas like *Avyayam* (Lack of exercise), *Swapnashayana* (Oversleeping), *Pishta - Snigdha Annasevana* (Consumption of starchy and fatty food) and all other *Kapha* increasing edibles should be avoided in order to prevent *Prameha* and its further complications.^[3]

2. **Ahara Vyavastha** - There is three basic pillars of life mention in *ayurveda Ahara*, *Nidra*, *Brahmacharya* among them *Ahara* is considered as a best preventive medicine. If a person follows dietary regimen, then there is no need of medicine. By understanding the importance of *Ahara* (Diet), both as a causative as well as curative agent in disease conditions prevention of disease is possible. Separate chapters have been allotted to the dietetic items in the classical texts under different group of food items such as^[4]

Sukadhanya Varga (Monocotyledons)	Shamidhanya Varga (Pulses)	Mamsa Varga (Meat)	Shaka Varga (vegetables)	Phala Varga (Fruits)
Yava (Barley) (Glycaemic index (G.I)- 30)	Mung bean (Green gram-G.I- 29)	Bater and Lavaka (Quail meat)	Changeri	Khajoor (G.I-42)
Godhuma (wheat flour)	Chana daal (Bengal gram-G.I- 8)	Kukkuta (Chicken meat)	Varahikanda (<i>Dioscorea bulbifera</i>)	Anjeer (G.I-51)
Shyamaka (Barnyard millet) (G.I-50)	Chicken Peas (G.I- 10)	Kapinjala meat (type of Bird meat)	Kakmachi (<i>Solanum nigrum</i>)	Apple (G.I-36)
Kodrava (Kodo millet)	Toor daal (G.I-22)	Kapota meat (Pigeon meat)	Patola (<i>Trichosanthes diocea</i>)	Naranga Phala (citrus reticulata-G.I-47)
Bajra (Pearl millet)	Black eye bean (cow peas- G.I- 44)	Paravata (Parrot meat)	Chakra marda (<i>Cassia tora</i>)	Amalaki
Jowar (Sorghum) - white jowar (G.I- 49) Yellow jowar (G.I-52)	Soyabean pulse (G.I- 15)	Shashaka (rabbit meat)	Mandukaparni (<i>Centella asiatica</i>)	Orange (G.I-43)

Shamsodhana Chikitsa in Diabetic Neuropathy

As *Prameha* is due to *Ama* in body so we should use the treatment for *Nirama*. *Snehana* (Oleation therapy), *Swedana* (Sudation therapy), *Sneha Virechana* (Oleation-induced therapeutic purgation) is the line of treatment of *Nirama Vatavyadhi* acc. to *Acharya Charaka*. However, *Swedana* is contraindicated in *Prameha* so only controlled *Swedana* can be done in the form of *Patrapotali Sweda*.

Abhyanga - *Abhyanga* controls the *Vata Dosha*, which is the root cause of neuropathy. *Abhyanga* stimulates

Swedavaha Srotas causing dilation of the blood vessel, thereby increasing the blood circulation reducing pain and stiffness.^[5]

Oil use in abhyanga- *Narayana Taila, Mahanarayana Taila, Bala Taila, Sahcharadi Taila* etc.

Swedana - *Swedana* opens all the channels of body and clears the block, dilates the blood vessels improves blood circulation which help in delivering essential nutrients and oxygen to peripheral nerves, potentially alleviating symptoms of neuropathy. As *Swedana* was contraindicated in *Prameha* so only *Mridu Sweda* can be used in *Prameha* like *Pottali Sweda, Shalishasti Sweda, Patrapinda Sweda* etc.

Basti - *Basti* is supposed to be specific treatment for *Vata Vyadhi* but indirectly effective in *Pitta* and *Kapha Dosha* also.

Acharya Charaka in *Charak Siddhi Sthana* 8/8, mention *Panchatikta Prasritik Basti in Prameha*-

Contents-

Contents	Properties ^[6]
<i>Nimba (Azadirachta indica)</i>	Compound such as Rutin and Quercetin have been shown to have hypoglycaemic effect whereas Nimidin have the weight reducing effect. The leaf extract contains alkaloids that are responsible for facilitating the restoration of insulin secretion through the regeneration of pancreas islet. Anthraquinones are used to treat peripheral neuropathy and reduce the level of blood sugar.
<i>Patola (Trichosanthes dioica)</i>	Antioxidant, low glycaemic index
<i>Saptaparna (Alstonia scholaris)</i>	increase peripheral utilisation of glucose, improve sensitivity of target tissues for insulin. In its bark antiatherogenic potential is present which prevent the further complications of diabetes.

<i>Rasana (Pleuchea lanceolata)</i>	<i>Vata - Kapha Shamaka</i> , reduce blood glucose level, antioxidant, increase insulin production.
<i>Chirayata (Swertia chirayita)</i>	It has mangiferin, which directly stimulate the Beta cells of pancreas to release insulin, reduce intestinal uptake of glucose.

Other examples of *Basti* where *Prameha* is one of the indications^[7]-

<i>Saindhavadi Anuvasana</i>	<i>Charak Siddhi Sthan</i> 4/13-16
<i>Vidangadi Anuvasana</i>	<i>Charak Siddhi Sthan</i> 4/18-22
<i>Patoladi Anuvasana</i>	<i>Charak Siddhi</i> 8/8
<i>Madhu Tailadi Niruha</i>	<i>Charak Siddhi</i> 12/13
<i>Patoladi Tikta Basti</i>	<i>Astang Hridaya Kalpa</i> 4/23-24
<i>Saindhavadi Anuvasana</i>	<i>Astang Hridaya Kalpa</i> 4/62-65
<i>Rasnadi Niruha</i>	<i>Sushruta Chikitsa</i> 38/70-75
<i>BhadraNimbadi Niruha</i>	<i>Sushruta Chikitsa</i> 38/59-62

3. Aushadha

Drugs and formulations use to manage the diabetic neuropathy have *Vatahara* properties, having potential to support nerve health and to reduce inflammation.

Drugs used -

Bala - *Bala* is considered as a nervine tonic because of its various properties like - *Vatapitta Shamak, Vedanasthapana, Shotahara, Balya, Vatahara, Raktapitta Shamak, Brumhana, Ojovardhak* etc.^[8] *Bala* on nervous system having effect as analgesic, anti-inflammatory, hypoglycaemic activities etc.

Formulations of Bala used in neuropathy

Balaristha (Bhaishajya Ratnawali 26/607)

Ksheerbala 101 capsules

Balataila

Mamsabalaadi Tailam

Ashwagandha - it has properties of *Kapha-Vatashamaka*, *Sothahara*, *Raktasodhaka*, *Vata Anulomana*, *Mastishka Shamaka*, *Deepana* etc.

Flavonoids found in the roots and leaves of *Ashwagandha* are used to cure diabetes.^{[9],[10]} It also has GABA mimetic effect and was shown to promote formation of dendrites. It has anxiolytic effect and improves energy levels and mitochondrial health. It also has anti-inflammatory action. *Ashwagandha* is commonly available as a *Churna*, a fine sieved powder that can be mixed with water, ghee (clarified butter) or honey. It enhances the function of the brain and nervous system and improves the memory. It also possesses potent antioxidant properties that help protect against cellular damage caused by free radicals.

Formulations used - *Balarishta*, *Ashwagandharishta*, *Ashwagandha Rasayan* etc.

Guduchi (*Tinospora cordifolia*) properties - *Tridoshashamak*, *Dahashamaka*, *Raktasodhaka*, *Pramehaghana*, *Deepana*, *Anulomana* etc.^[11] *T. cordifolia* is an age-old renowned medicinal plant having different medicinal properties such as anti-hyperlipidaemic, anti-hyperglycaemic, antioxidant, anti-neoplastic, anti-stress, anti-inflammatory, anti-allergic and immunomodulatory properties.

Triphala - *Triphala* is an important Ayurvedic formulation consisting of the dried fruits of three medicinal plants *Terminalia chebula*, *Terminalia bellerica*, and *Embelica officinalis*. *Pramehahara* property of *Triphala* is very well described in *Brihatrayee* especially in *Chikitsa* of *Prameha*.^[12]

Individual drugs of *Triphala* contain glycosides, alkaloids, terpenoids, flavonoids, carotenoids, etc., and these all are frequently implicated to possess potential as antidiabetic.^[13] *Triphala* has anti-inflammatory, antioxidant, immunomodulating, antibacterial, antimutagenic, hypoglycemic properties. Polyphenols present in *Triphala* modulate the human gut microbiome and therefore promote the growth of beneficial bacteria of gut (*Bifidobacteria* and *Lactobacillus*). The bioactivity of *Triphala* is elicited by

gut microbiota to generate a variety of anti-inflammatory compounds. Gallic acid and ellagic acid are the hydrolyzable tannins present in *Triphala Churna* have reported for their beneficial effect on diabetic nephropathy. Gallic acid has shown a neuroprotective effect via reduction in inflammation and oxidative stress. *Triphala Churna* may show neuroprotective effect via inhibiting inflammation, oxidative stress, and by reducing neuronal damage.

Formulations of *Triphala* used-

Triphalaadi Kwatha

Gokshur Guggulu Vatika

Trikatvadi Guggulu etc.

Nisha Amalaki - It consist of 2 important drugs *Nisha* (*Curcuma longa*) and *Amalaki* (Indian gooseberry) prove to be very efficacious in the treatment of diabetes mellitus and its complications.

Nishamalaki possess Antihyperglycemic, Antidiabetic, Insulinomimetic, α -Amylase inhibitory and α -glucosidase inhibitory, Antioxidant properties. It improves insulin sensitivity, increases glucose uptake by skeletal muscles and is beneficial in the management of *Madhumeha*, *Prameha* and Diabetes as well as prevention of its complication's microvascular complications one of them is diabetic neuropathy.

Acharya Chakradutta in *Vatavyadhi* mention *Jhinhini Vatachikitsa* which is use in the treatment of neuropathy-

Contents - *Dashamoola*, *Pushkarmoola*, *Hingu*

Dashamoola consist of *Brihatpanchamoola* (*Bilwa*, *Agnimantha*, *Shyonaka*, *Patala*, *Gambhari*) and *Laghupanchamoola* (*Brihati*, *Kantakari*, *Shalaparni*, *Prishnaparni*, *Gokshura*).^[14] *Dashamoola* has properties like - *Tridoshahara*, *Rasayana*, *Dhatuposhaka*, *Shothahara*, *Balya*, *Deepana*, *Pachana* etc. Ingredients of *Dashamoola* are rich in Sitosterols, Flavonoids and Glycosides that regulates the function of important hormones therefore regulate the status of neuroendocrine system. It has a powerful antioxidant effect; Stimulates Nervous system therefore use in diabetic Neuropathy.

Shilajatu - It is one of drug describe to use in treatment of *Prameha* having properties like *Balya*, *Tridoshashamak*, *Yogavahi*, *Vrisya*, *Rasayan* etc. It also has *Dehadardhyakara* property which can improve the consistency and quality of tissue elements. It helps in the removal of excess *Meda* and *Kapha* therefore reduce the obstruction of *Srotas* therefore use in treatment of *Prameha* and its complications.^[15]

Formulations used - *Chandraprabha Vati*, *Shilajatvadi Lauha* etc.

Bio Purifactory methods (*Samshodhana*) and (*Samshamana*) are the modes of treatment indicated for the complete eradication of *Doshas* and to eliminate the disease.

4. Vihara - By following *Sadvritta* exercising 30 minutes a day reduces the risk of diabetes. Some of exercises that one can perform are - Walking everyday, practising Yoga etc.

- *Lepana* of *Agaru*, *Usheera*, *Twaka*, *Ela* and *Chandana*
- *Jalavaseka*
- *Ruksha Praghada Udwartana* (*Triphala Churna*, *Kolakulathadi Churna* etc.)

DISCUSSION

Ageing is defined as the time sequential deterioration that occur in most living beings, including weakness, increased susceptibility to disease and adverse environmental conditions, loss of mobility and agility and age-related physiological changes. Ayurvedic System of medicine is perhaps the first which efforts to shield life of human being from ailment and aging. *Acharya's* classify age into 3 phases. Acc. to *Acharya Charaka*, *Balyavastha* (from birth up to 30 yrs of age with the dominance of *Kapha*), *Madhyamavastha* (30 yrs to 60yrs with dominance of *Pitta*), *Vridhavasta* (from 60 yrs to 100 yrs with dominance of *Vata*). Throughout this time individual loses the potency of *Dhatu*s, potency of sense organs, energy, masculinity, courage and power of understanding, preservation, memory, language and ability to analyze facts. There is progressive reduction of *Dhatu*s and governance of

Vata in this present era causing various types of age-related disorders. One of them is Diabetic Neuropathy which is a chronic condition that results from uncontrolled diabetes. By using all the above-mentioned Ayurvedic regimen, one can easily be prevented from diabetes and its further complications occurred.

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