



## Review Article

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### BAHIR PARIMARJANA CHIKITSA IN THE MANAGEMENT OF DIABETIC PERIPHERAL NEUROPATHY: A REVIEW

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#### ABSTRACT

Peripheral Neuropathy is one of the most common micro vascular complications of Diabetes Mellitus characterized by paresthesia, significant deficits in tactile sensitivity, vibration sense, lower limb proprioception and kinesthesia. Due to the knowledge of the adverse effects of long term use of modern medicine there is a growing interest towards Ayurvedic System of Medicine for the treatment of Diabetic Peripheral Neuropathy (DPN). Bahirparimarjana Chikitsa, the external purificatory measures like Abhyanga, Sweda, Lepa etc plays a significant role in the management of DPN. Hence this article highlights the importance of Bahir Parimarjana Chikitsa in the management of DPN.

**Keywords:** Diabetes Mellitus, Diabetic Peripheral Neuropathy, Bahir Parimarjana Chikitsa.

#### INTRODUCTION

Diabetes is a growing challenge in India with estimated 8.7% diabetic population in the age group of 20 and 70 years<sup>1</sup>. Diabetes mellitus (DM) is a common cause of neuropathy worldwide. Prevalence of neuropathy in diabetic patients ranges from around 10.5% to 32.2% in various studies across India<sup>2</sup>. Diabetic neuropathy is defined as signs and symptoms of nerve dysfunction in a patient with DM in whom other causes of nerve dysfunction have been excluded<sup>3</sup>.

Diabetic Peripheral Neuropathy (DPN) is one of the micro vascular complications of DM. Diabetes Mellitus can be closely co-related to Madhumeha, one among the four varieties of Vataja Prameha and the symptoms of DPN are scattered in the Poorvarupa (prodromal symptoms) and Upadrava (complications), but may be correlated to Upadrava because, patient generally approaches the physician in the Vyaktaavastha of the Vyadhi or when Upadravas have already manifested. Due to the knowledge of the adverse effects of long term use of modern medicine there is a growing interest towards Ayurvedic System of Medicine for the treatment of DPN. Antar Parimarjana (Internal therapy), Bahir Parimarjana (External therapy) and Shastra Praneedana<sup>4</sup> (Surgical intervention) is the Trividha Chikitsa Bheda in Ayurveda. Among which Bahir Parimarjana Chikitsa gives significant results in the symptomatic management of Madhumeha Upadravas, especially in the conditions where Upadrava will dominate the picture of Pradhana Vyadhi.

#### DIABETIC PERIPHERAL NEUROPATHY

In Diabetic Peripheral Neuropathy, typically the most distal parts of the extremities are affected first and as the symptoms advance above the knees, the distal upper limbs get involved. This is called as stocking-glove pattern. It is the commonest type and probably accounts for 75% of the DNs. It may be sensory and/ or motor and may involve small or large fibers, or both. Large fibre involvement causes painless paraesthesias with impairment of vibration, joint position, touch and pressure sensations and loss of

ankle reflex. Small fibre neuropathy on the other hand is associated with pain, burning and paraesthesias<sup>3</sup>.

#### Pathophysiology

Factors leading to the development of Diabetic Neuropathy are not understood completely; multiple hypotheses have been advanced. Important biochemical mechanisms are polyol pathway, advanced glycation and oxidative stress.

#### Polyol Pathway

Intracellular glucose is predominantly metabolized by phosphorylation and subsequent glycolysis. But when there is hyperglycemia, some glucose is converted to sorbitol by the enzyme aldose reductase. Increased sorbitol concentration alters the redox potential, increases cellular osmolality, generates reactive oxygen species and likely leads to other types of cellular dysfunction<sup>5</sup>. It leads to a cascade of events like:

- Reduced membrane Na-K ATPase activity, intra-axonal sodium accumulation which reduces nerve conduction velocity and brings about structural breakdown of the nerve.
- Myoinositol level is decreased because elevated levels of both glucose and sorbitol compete for the uptake of myoinositol in the tissues and cells.
- Reduced NADPH, a cofactor for the enzyme nitric oxide synthesis, reduces nitric oxide formation leading to decreased vasodilatation, that impairs blood supply to the nerve.<sup>6</sup>

#### Advanced glycation end products (AGE)

Increased intra-cellular glucose causes non-enzymatic glycation of intra and extra cellular proteins by interaction of glucose with amino acid groups on proteins, resulting in formation of advanced glycosylation end product (AGEs).

Early non-enzymatic glycation products are reversible. As hyperglycemia continues, intermediate poorly reversible products are formed and later irreversible AGEs are formed. AGEs have been shown to crosslink proteins, accelerate atherosclerosis, reduce nitric oxide synthesis, induce endothelial dysfunction and alter extra - cellular matrix<sup>7</sup>.

### **Oxidative Stress**

The increased production of free radicals in diabetes may directly damage small blood vessels supplying nerves, leading to nerve ischemia.

### **Management**

Management involves establishing that the neuropathy is caused by diabetes and aiming for optimal glycemic control.

Medications for the treatment of DN are usually antidepressant drugs or anticonvulsant agents, Aldose-reductase inhibitors and/or antioxidant alpha-lipoic acids may improve neuropathic symptoms<sup>8</sup>.

### **DISEASE REVIEW AS PER AYURVEDA**

According to Ayurveda, the description of disease Madhumeha has similarity to the description of Diabetes Mellitus. In Madhumeha, due to various Nidanans, vitiation of Vata Pradhana Tridosha takes place and two types of Samprapti (Pathology) can be seen in causation of Madhumeha. They are Aavarana and Dhatukshayaja Samprapti.

#### **Aavarana Samprapti**

Excessive Kapha and Meda does Aavarana (obstruction) to the Gati of Vata Dosha leading to the Triyag Gati of Vata Dosha which draws the Ojas and carries towards Basti and produces Madhumeha.

#### **Dhatukshayaja Samprapti**

Aggravated Vata causes Agni Vaikruti leading to Dhatukshaya. The Vata Dosha due to its Rookshata converts the Madhura Rasa of Oja into Kashaya Rasa. Kashaya Rasa Oja is excreted from Mutravaha Srotas which is termed as Madhumeha.

#### **Upadravas**

Prakupita Vata with the other Doshas and Dhatukshayaja Avasta results in the manifestation Upadrava and exhibit the symptoms such as Makshikopasarpanam (Paraesthesia), Suptata (numbness) due to Kapha Dosha. Daha (burning sensation) and Paridhupana are attributed to Pitta Dosha. Kampa (tremor), Shoola (pain)<sup>9</sup>, Dourbalya (weakness)<sup>10</sup> undoubtedly due to Vata Dosha. These symptoms can be closely correlated to the symptoms of Diabetic Peripheral Neuropathy.

#### **Chikitsa**

Treatment modalities in Ayurveda can be broadly classified under three headings Antar Parimarjana Chikitsa, Bahir Parimarjana Chikitsa and Shastra Praneedana<sup>4</sup>.

In this condition, dual management lines directed towards both Pradhana vyadhi and Upadrava is needed.

Antar Parimarjana Chikitsa plays role in treating the Pradhana Vyadhi as well as the Upadrava. But Bahirparimarjana Chikitsa plays a vital role in the symptomatic management, especially in the conditions where Upadrava will dominate the picture of

Pradhana Vyadhi. Based on the Lakshanas, Dosha, Prakruti, Rogi Bala the suitable treatment modality and drug may be selected.

### **BAHIRPARIMARJANA CHIKITSA**

It is the external purificatory measures like Abhyanga, Sweda, Lepa etc<sup>4</sup>.

The Bahirparimarjana Chikitsa that are beneficial in the management of Diabetic Peripheral Neuropathy are as follows.

### **PADAABHYANGA**

Application of oil to the feet followed by massage is known as Padaabhyanga.

#### **Mode of action**

Lack of blood circulation is one of the reasons for impaired sensation and the altered blood flow causes improper oxygen & nutrient supply to the nerves. Microvascular injuries involving small blood vessels that supplies to nerves i.e. vasa nervorum are responsible for diabetic peripheral neuropathy. Padaabhyanga by its mechanical maneuver produces heat and causes vasodilation which improves circulation there by gives symptomatic relief.<sup>11</sup> According to Ayurveda Vata dominates Sparshanendriya. Through Padaabhyanga, Sneha mitigates Vata and based on the Taila used, Lakshanas of respective Doshas are relieved.

#### **Tailas for Padaabhyanga**

Mahanarayana Taila, Dhanvantara Taila, Bala Taila are considered to be the best Vatahara Tailas. Hence can be used in Vatapradhana Lakshanas like Shoola, Dourbalya. Maha Masha Taila, an Ushna, Vatahara, Brihmana Taila can be used in Vata Vruddhi due to Dhatukshaya leading to Kampa and Shosha.

In patients presenting with Chimachimayana, Ksheerabala Taila and Pinda Taila which are Vata Pitta Shamaka Tailas can be used. In patients with Daha as Pradhana Lakshana, Ketakimuladi Taila, Aranaladi Taila which are Sheeta Veerya, Kevala Pitta Shamaka Tailas can be used for Padaabhyanga or Sthanika Abhyanga.

Suptata and Makshikopasarpana are symptoms due to Kapha or Aavarana hence initially Rukshana should be adopted. Vata Kaphahara Tailas like Sahacharadi Taila, Kottamchukkadi Taila or Maha Vishagarbha Taila Abhyanga can be performed alternatively to Rukshana or can be succeeded by it, to check the Vata aggravation. In Sthula Pramehi with similar Lakshanas, Brihat Saindhavadi Taila or Chinchadi Taila which are Kapha – Vatahara Tailas can be used.

### **UDWARTHANA**

Udwarthana is a procedure of massaging the whole body or the required part with powders of herbs in Pratiloma Gati (direction opposite to the orientation of hair in the body).

Udwarthana is indicated in Sthoola Pramehi and in Aavarana Samprapti of Madumeha and Contraindicated in Krusha Pramehi. Instead Utsadana (Powder of herbs mixed with oil and rubbed against the hair follicle), a type of Udwarthana would be beneficial in Krusha Pramehi.

#### **Benefits**

Udwarthana is Kapha - Vata Hara, does Siramukha Viviktatva (opens up the blocked channels) enables free circulation or improves circulation, improves the condition of the nervous system by stimulating the cutaneous nerve and is beneficial in

Maakshikopasarpna, Suptata which are Kaphaja Upadrava and in Kaphaavruta Vata condition.

Triphala Choorna, Kolakulathadi Choorna, Eladi Choorna can be used for the purpose of Udwarthana.

### LEPA

The medicines in the form of paste, used for external application are called as Lepas.

Lepa should be applied in opposite direction of hair follicles which facilitates easy absorption of the drug through the Romakupa.

### Mode of action

The Veerya of the Dravya used in Lepa enters into the body through Sookshma Srotas after undergoing absorption through Bhrajaka Pitta abided in the skin.

The action of Lepa depends on materials used for the application. The drugs by virtue of their Guna and Prabhava acts differently on different Doshas and Prakruti.

Table 1: Drugs used for Lepa

Shoola	Daha	Suptata
Eranda Taila + Saindhava Lavana	Shatadouta Ghrita <sup>12</sup> Yava + Kanji <sup>12</sup>	Kolakulattadi Choorna Lepa Chincadi Lepa
Nirgundi Kalka Lepa	Amalaki + Kanji <sup>12</sup> Candana lepa <sup>12</sup> Navaneeta lepa	

### TAKRADHARA

Takradhara is a variety of Shirodhara in which Takra processed with Amalaki and Musta is poured in a continuous stream over the forehead in a specified manner.

### Probable Action of Takradhara

The excessive secretion of cortisol produced by stress causes rise in blood levels of glucose this may be reduced due to the relaxation effect of Takradhara which is the preliminary management of Diabetic Neuropathy. It also improves peripheral circulation which aids in the symptomatic management of DPN.

### SWEDANA

The therapy in which the perspiration is produced is known as Swedana, it is indicated in the management of many diseases particularly those of Vata and Kapha Dosha origin.

Swedana (Tikshna Sweda) is contraindicated in Prameha condition as it does Deha Visheeryana due to Medhobahulyata<sup>13</sup>.

But Mrudu Sweda can be advised as Shodhana Poorva Sweda and as Laakshanika Chikitsa for Prameha Upadrava, Sthanika Sweda can be adopted.

### Indication of different Swedas

Pain occurs when there is reduced blood circulation to the particular area. By Swedana, Ushna Guna stimulates circulatory channels and causes vasodilatation, which increases blood circulation and reduces pain. Hence Vatahara Swedas are useful like Nadi Sweda with Nirgundi Patra, Eranda Patra or Beeja etc or Patra Pinda Sweda.

Shashtika Shali Pinda Sweda, a Vatahara Bruhmana Sweda would be beneficial in Upadrava like Kampa, Shosha.

Drava Sweda / Parisheka is useful in Pittaanubandha Vata condition. Hence, can be adopted to relieve Upadras like Daha and Chimachimayana. Parisheka can be done with following Dravya shown in Table 2.

Table 2: Dravya for Parisheka Sweda and its Properties

Dravya for Parisheka	Properties
Manjistadi Kashaya Seka	Pittahara mainly
Guduchi Ksheera Kashaya Seka	Guduchi - Tridosahara, though Ushna Veerya due to its Madhura Vipaka acts as Dahahara Ksheera – Vata Pittahara.
Bala Ksheera Kashaya Seka	Bala – Vata Pittahara Sheeta Veerya

Rooksha Sweda like Jambheera Pinda Sweda, Valuka Sweda, Dhanyamla Seka, would be beneficial in Upadras like Suptata, Makshikopasarpna due to Kapha or Aavarana.

### CONCLUSION

DM related complications are preventable with good glycemic control. The progression of most of the complications can be further halted if detected early and appropriate therapy is instituted.

Bahirparimarjana Chikitsa can be adopted for the symptomatic management of complications which are already manifested. As a Dinacharya measure, if procedures like Padaabhyanga or Udwarthana/ Utsadana is practiced, it helps in the prevention of Diabetic Peripheral Neuropathy in a Diabetic individual at the

early stage and Diabetic foot in Chronic Hyperglycemic individuals.

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