



Case Study

AYURVEDIC TREATMENT MODALITIES OF DIABETIC PERIPHERAL NEUROPATHY

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ABSTRACT

Diabetic peripheral neuropathy is the damage of the nerves due to the uncontrolled diabetes. It can affect any of the neurons. Diabetic distal symmetric sensory and sensorimotor polyneuropathy is the most prevalent type of diabetic neuropathy. The symptoms appear as sensory loss, first in the toes and progressively moving up the legs, fingers, and arms over time. Tingling sensation, Burning sensation, Deep aching pain are other related symptoms. A patient age 54 years with diabetes for past 15 years, hypertension, dyslipidemia, complains of burning sensation of both feet (right>left), numbness, pricking pain, unsteadiness while walking, brownish red discolouration of both lower limbs. The symptoms were gradual in onset. Nerve Conduction Study showed axonal type of motor and sensory affecting peroneal nerve neuropathy. He admitted in Vaidyaratnam Ayurveda College Hospital, done Vibrotherm Neuropathy Analyzer and revealed small and large fibre neuropathy with severe loss of sensations. The main intention of the study is to improve the quality of life of the patient by reducing the symptoms that is disturbing his day today routine. Patient given with anti diabetic Ayurvedic formulations internally. Externally *Rookshana, Vatahara, Brimhana* treatments were done. After the treatment, Michigan neuropathy screening instrument, diabetic Neuropathy symptom score, Toronto clinical scoring system score were reduced. Neuropathy Analyzer showed mild to moderate loss of sensation. By adopting *Prameha hara chikitsa* coupled with *Vata vyadhikara chikitsa*, complications of diabetes can be managed. It is important to focus on diet and regimen since diabetes is a lifestyle disorder and, in ayurveda it is considered as an *Anushangi Vyadhi*.

INTRODUCTION

In affluent nations, diabetic peripheral neuropathy is the most frequent cause of peripheral neuropathy. Polyneuropathy in its various manifestations is linked to diabetes.^[1] The prevalence of diabetic peripheral neuropathy in India is estimated to range considerably from 9.6% and 75% depending on the population. Long-term diabetes that is not well controlled, retinopathy, and nephropathy are risk factors for diabetic peripheral neuropathy.^[2] DSPN is the most common type of diabetes peripheral neuropathy. It include tingling sensation, burning sensation, deep aching pain.^[3] It is progressive in nature starting from legs, then to arms and fingers.

Patients may experience sensation loss in the trunk in extreme situations. Studies on nerve conduction revealed diminished amplitude and modest to moderate conduction velocity slowing. Axonal degeneration, endothelial hyperplasia, and perivascular inflammation are found in nerve biopsies.^[3] The only way to control the symptoms is reducing the blood sugar levels. In Ayurveda, diabetic peripheral neuropathy can be correlated to *Prameha Upadrava* which include *Avarana Janya Vatavyadhi Lakshnas*.^[4] In Ayurvedic classical text, the *Prameha upadravas* are classified on the basis of predominance of *Dosas*. *Avipaka, Aruchi, Atinidra* comes under *Kaphaja upadrava*. In *Pitta pradhana, Toda in Basti, Mehana, Daha, Trishna, Amlaka. Udavarta, Kampa, Hridgraha, Soola, Anidra* comes under *Vata pradhana upadrava*.^[5] DPN is having *Upadrava of Prameha. Kapha, Pitha rakta, Medas, Mamsa* produces *Avarana* to the *Gathi of Vata*. In *Susruta Samhitha*, it is explained that *Upadravas of Prameha* lies more in lower part as

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the *Rasayanis* are closed.^[6] The management of DPN is by administering *Pramehahara oushada* internally and externally removing the *Avarana* of *Vata* by different entities by adopting *Vatavyadhi hara chikitsa*. While managing the symptoms of DPN care should be given in advising a specific diet and regimen as diabetic is a lifestyle disorder. *Rasayana chikitsa* can prevent further progression of the disease complication.^[7]

Case History

A patient of age 54 years, complaints of burning sensation and numbness of both feet. He also felt pin and needle sensation of both feet during night hours. He felt severe pain even a cloth touches his feet. He also complaints of unsteadiness in walking, brownish red discolouration of lower leg especially feet. The symptoms were gradual in onset. 6 months before, he felt muscle cramps of leg, thereafter burning sensation and numbness started. Gradually the pin and needle sensation started. It is more on right feet fingers than left. 3 months back, feeling of unsteadiness of gait started.

Patient History

This patient age of 54 years was diabetic for 15 yrs, having dyslipidemia, hypertension. He is an electrician belonging to middle class family came to OPD of Vaidyaratnam Ayurvedic Hospital. The patient is having a habitual intake of alcohol. Diet of the patient is mixed, more font of sour, acrid, sweet. Appetite is good, micturition 4 times/day and 2 times/night. Sleep was disturbed due to pain of pin and needle type sensation. There is no family history.

Treatment History

Patient was on medication for diabetes, hypertension, dyslipidemia for last 4years, he started using insulin injection 7IU. Now he is taking 35 IU morning and 30 IU at night, oral medication metformin hydrochloride tab Ip 500mg 1 tab twice daily after food, Atorvastatin 1 tab night, Amlodipine biciliate tab IP 5mg 1 Tab morning after food, sitagliptin phosphate tab ½ morning after food.

Systemic Examination

Examination of Central Nervous and Sensory System

Patient was lean built, moderately nourished with a height of 158cm and weight of 45kg, BMI of 18 kg/m². Appearance was neat and tidy, behaviour was cooperative a responsive, orientation to time place and person was intact. Intelligence intact. On examination of sensory system by using the neuropathy analyser, both large fibre and small fibres affected. Severe loss of vibration sensation in left foot, moderate loss of vibration sensation in right foot, hot temperature sensation is severely lost in both foot, cold temperature sensation severely lost in right foot and moderately loss in left foot. Fine touch was intact.

stereognosis graphesthesia, proprioception was intact. visual analogue scale score 10.

Ayurvedic Parameters Examination Details

- The *Sarira prakrithi* of patient is *Vata pitta prakrithi* using TNMC Questionnaire.
- *Doosyas* affected are *Tridosha Vata pitta pradhana*
- *Rakta Mamsa Medas Asthi vahasrotas* is affected
- *Upadhatus snayu siras* affected
- *Rogamarga* is *Madhyama roga marga*
- *Saram- Madhyama*
- *Samhananam- Madhyama*
- *Sathwam- Avara*
- *Sathmyam- Katu Amla Madhura satmya*
- *Pramanam- Madhyama*
- *Abyavaharana Sakthi- Madhyamam*
- *Jarana Sakthi- Pravaram*
- *Vyayamasakthi- Avaram*
- *Vaya- Madhyamam*
- *Kshanadi Kalam- Greeshmam*
- *Vyadhyavastha Kalam- Navam*
- *Bhoomi- Sadharanam*
- *Deham- Adhakayam*
- *Nidanas* are *Madhura katu amla ahara, Madhya, Prameha, Nidranasha, Ativyayama, Athichintha, Bhaya*.
- *Poorvaroopo - Pindikodweshta* (muscle cramps), *Daha* (burning sensation)
- *Roopa- Balakshaya* (unsteadiness), *Shoola* (pain)
- *Samprapthi-* due to above *Nidanas, Prameha janana*, this caused the *Srothothorodha* which in turn lead to the manifestation of *Prameha upadravas*.

Diagnostic Assessment

Patient's clinical presentations reached at a diagnosis by using diagnostic method Nerve Conduction Study revealed that Axonal type Motor and Sensory affecting Peroneal nerve neuropathy and also using Neuropathy Analyser -vibrotherm showed large and small fibre neuropathies. Michigan Neuropathic Screening Instrument,^[8] Toronto clinical scoring,^[8] Diabetic Neuropathy Symptom score ^[8] for assessing before and after treatment score. Diagnosis of the case was *Prameha Upadrava* (complication of diabetes - diabetic peripheral neuropathy).

Therapeutic Intervention

Treatment is mainly concentrated on improving the quality of life of the patient by reducing the clinical symptoms. Internal medicines started 1 week before the time of admission (22-may-2023) (Table 1) from the day of admission (29 may 2023) internal medicines changed and started external treatment commencing from *Rookshana, Snehana* in form of *Choorna Pinda Sweda, Lepana, Patrapotali*

sweda, Ksheeravasthi, Sashtika Salipinda Sweda based on the condition of the patient the treatment proposed. The external treatment is given in the Table 2.

Table 1: Oral administration of medicines

Date	Internal medicines	Dosage	Time
22 may 2023	1.Sahacharadi Kasayam 2.Chandraprabha Gulika 3.Nisakathakadi Toyam	60ml bd 1-0-1 with Kasayam 15gm Choornam + 1½ litre water boiled strained and take frequently	6am, 6pm Frequently
29 may 2023	4.Pinda Tailam for external application on bilateral foot 1.Nisakathakadi Toyam 2.Chandraprabha Gulika	15gm Choornam + 1½ litre water boiled strained and take frequently 1-0-1	After food

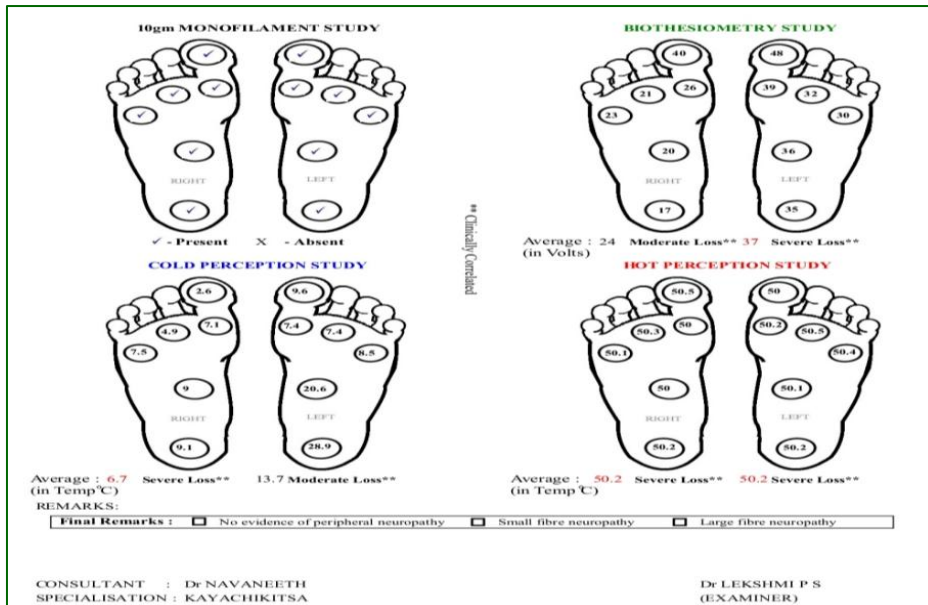
Table 2: External Treatment

Date	Medicine	Procedure	Outcome
30 may 2023 to 1 June 2023	Internal medicine 1. Nisakathakadi Toyam 2. Chandraprabha Gulika External medicine 1. Dhanyam 2. Jadamyadi Choornam 3. Dhanyamlam	1. Dhanyakizhi rooksham 2. Lepamam with Jadamayadi choornam + Dhanyamalam on foot (right) 3 days	No change in burning sensation, numbness and pain persist on right foot little finger.
2 June 2023 to 5 June 2023	Same internal medicines Externally 1. Murivenna 2. Dhanyam 3. Jadamayadhi Choornam 4. Dhanyamalam	1. Dhanyakizhi Snighdham with Murivenna 2. Lepamam continued	No change in symptoms on 2 June 2023 to 4 June 2023 5 June 2023 -burning sensation reduced and pain persist
6 June 2023 to 12 June 2023	Same internal medicines Externally 1. Vatahara drugs 2. Murivenna	1. Patrapotali Swedam with Murivenna 2. Stopped Lepamam	On 10 June 2023-moderate pain on toe (right), burning sensation reduced
13 June 2023 to 15 June 2023	Same internal medicines Externally 1. Njavara rice 2. Murivenna	1.Shashtikasali Pindaswedam with Murivenna (3 days)	On 14 June 2023 -burning sensation reduced, unsteadiness of walking reduced.
13 June 2023 to 15 June 2023	1. Panchatikthakam Gritham-50ml 2. Saindavam-15gm 3. Honey-100ml 4. Milk -200ml	2.Ksheeravasthi with Panchatikthagritham Saindhavam, honey Ksheeram (2 days)	
15 June 2023		Discharged	

RESULTS

After the treatment, significant changes observed in MNSI (Michigan neuropathy screening instrument), DNS (diabetic Neuropathy symptom score), TCSS (Toronto clinical scoring system). Vibrotherm Neuropathy analysing instrument scoring reduced. Visual analogue scale reduced to 6.Comparison of symptoms before and after is given in Table 3, 4, 5, 6. After treatment, patient is able to walk without any imbalance, burning sensation, numbness. Pain is reduced to a greater extent. Vibrotherm Neuropathy Analyser showed mild to moderate loss of sensation. As a whole patient's quality of life improved.

Vibrotherm Analyser -Before Treatment-22/MAY/2023



Vibrotherm Analyser After Treatment-15/JUNE/2023

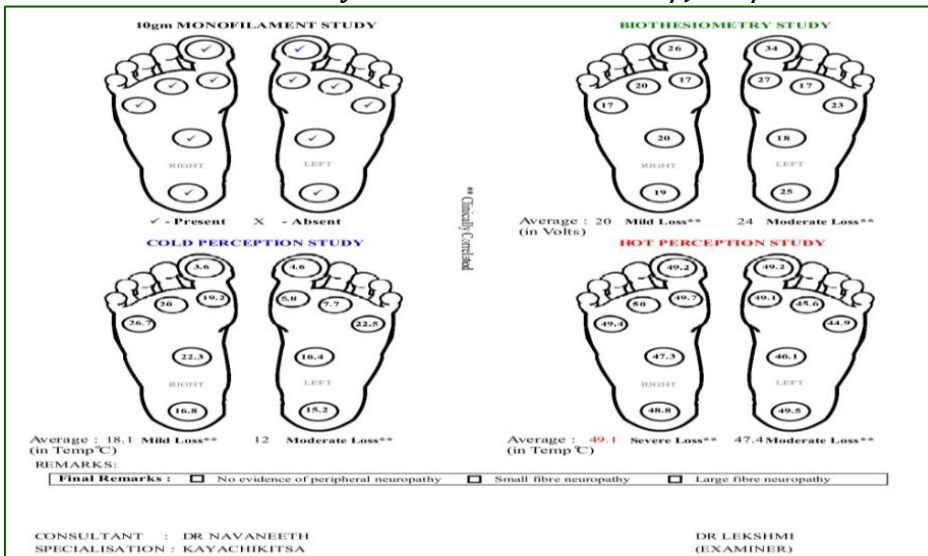


Table 3: MNSI

MNSI items	Before treatment	After treatment	Scoring
Appearance of feet	1	0	0-normal, 1-abnormal
Ulceration	0	0	0-normal, 1-abnormal
Ankle reflexes	0.5	0	0-present, 0.5-reduced, 1-absent
Vibration perception	1	0.5	0-present, 0.5-reduced, 1-absent

Table 4: DNS

Symptoms	Before treatment	After treatment	Scoring
Unsteadiness on walking	1	0	1-present 0-absent
Numbness	1	0	1-present 0-absent
Burning sensation, aching pain, tenderness in legs and feet	1	0	1-present 0-absent
Pricking sensation	1	0	1-present 0-absent

Table 5: TCSS

Symptom score	Before treatment	After treatment	Scoring
Pain	1	0	1-present, 0-absent
Numbness	1	0	
Tingling	0	0	
Weakness	1	0	
Ataxia	1	0	
Upper limb symptoms	1		
Reflex score			0-normal, 1-reduced, 2-absent
Knee right	1	0	
Knee left	1	0	
Ankle right	1	0	
Ankle left	1	0	
Sensory test score			0-normal, 1-abnormal
Pinprick	0	0	
Temperature	1	0	
Light touch	0	0	
Vibration sense	1	0	

Table 6: Comparison of before and after Assessment Score

Assessment	Before treatment	After treatment
DNS	4	0
MNSI	2.5	0.5
TCSS	11	0
Vibrotherm Neuropathy Analyser	Severe loss of sensation	Mild to moderate loss of sensation

DNS: Diabetic Neuropathy Symptom Score, MNSI: Michigan Neuropathy Screening Instrument, TCSS: Toronto Clinical Scoring System

DISCUSSION

Diabetic Peripheral Neuropathy occurs as a result of the damage of nerves due to uncontrolled diabetes. The sensory symptoms of diabetic peripheral neuropathy can be seen in the different types of *Avarana vatha*. The motor symptoms of DPN can be seen in the *Prameha upadrava*.^[9] The treatment mainly focus on reducing symptoms of DPN as it is considered as *Prameha upadrava* with *Vata pitta* predominant symptoms.^[10] Treatment can be staged under *Rookshana*, *Vatahara*, *Brimhana*. Treatment protocol includes *Deepana Pachana srothosodana Pathya ahara vihara*. Internally, *Prameha hara oushadha*, *Nisakathakathi Toyam* and *Chandraprabha Gulika* are given. *Nisakathakadi* is specifically indicated for *Prameha* and its complications.^[11] It is having an antioxidant property and anti-inflammatory action. Since *Amalaki* is present, it will create a mild purgation effect. *Chandraprabhavati* is having circulatory and neurological action related to diabetes and also having anti-inflammatory action^[12]. It is having anti-diabetic property by increasing the insulin secretion.

Bahirparimarjana chikitsa (external treatment) gives significant result in the diabetic peripheral neuropathy.^[13] Externally, treatment started with *Dhanyakizhi* in the form of *Rooksha sweda*. This will remove the inflammation and it removes the *Avarana*^[14], *Lepana* with *Jadamyadhi Choorna* in *Dhanyamla* on the right foot helps in reducing pain and swelling of the foot. After attaining *Samyak rookshatha*, started with *Dhanyakizhi Snigdha Sweda* with *Murivenna*. Since the complications are *Vata Pitha Pradhana*, *Murivenna* will be a best choice. It is *Sheetha*, *Sophahara*, *Soolahara*. It is having healing property.^[15] Thereafter, *Patrapotali swedam* with *Murivenna* done. It is *Vatahara* in nature as it contains *Lavana amla madura pradhana vatahara* leaves, it relaxes, rejuvenates and nourishes the affected area.^[8] It improves peripheral blood circulation, reduces inflammation, give relief from pain and stiffness. At last *Shashtika Sali pinda Sweda* with *Murivenna* was done. *Shashtika* is having *Guru Seetha*, *Snigdha*, *Brimhana* property.^[16] It is very good in the case of a *Krishna pramehi* who is predominant of *Vatha*

pitha pradhana prameha upadrava. Along with *Shashtika Sali Pinda Swedam*, *Ksheeravasthi* with *Pancha Tiktha Gritha* also done.^[8] It relieves burning sensation, provides strength, improves complexion, reduces pain, reduce the diabetes. Care also given to the patient in case of diet and regimen though the disease is lifestyle disorder. At the time of discharge patient is advised to follow *Pathya*, avoid alcohol, *Madhura amla lavana snigdha guru aharas*.

CONCLUSION

The sensory and motor symptoms of Diabetic Peripheral Neuropathy managed by the Ayurvedic treatment protocol very effectively. Internal as well external treatment is equally important in the management of diabetic peripheral neuropathy. Continuous administration of anti diabetic Ayurvedic medication for diabetes can limit the further progression of the diabetic peripheral neuropathy. Quality of life of the patient improved by systematic assessment and scientific approach. *Rasayana* plays also a detrimental factor in management of diabetic peripheral neuropathy. Studies on management of diabetic peripheral neuropathy with *Rasayanas* is needed in the future years.

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