

Ayurvedic Management of Diabetic neuropathy - A Case Study

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Diabetic neuropathy refers to various forms of nerve damage caused by chronic diabetes mellitus. The most common type is **diabetic peripheral neuropathy**, and approximately half of individuals with diabetes experience some form of peripheral neuropathy, which can manifest as either polyneuropathy or mononeuropathy.¹ Symptoms can manifest as motor, sensory, or autonomic changes, depending on the location of the nerve damage. These changes often arise due to microvascular injury, which affects the small blood vessels that supply nerves. The resulting damage can cause a range of complications, including altered muscle function, sensory disturbances, or impaired autonomic processes.¹ Modern medical management primarily focuses on controlling diabetes, with treatments largely limited to symptomatic relief. In ayurveda, diabetic neuropathy is considered as a complication of prameha, with treatment aimed at balancing the doshas and dushyas involved in the pathogenesis.

This case report details a 48-year-old female patient, a known diabetic for over 10 years, who presented to the Roganidana OPD of Government Ayurveda College Hospital, Kannur, Kerala, with complaints of numbness in both lower limbs, particularly over the soles of her feet and mid-calf region. She also reported weakness in her legs while walking, pain in both knee joints, and lower back pain, especially when rising from a bent posture. Initially, oral medications were prescribed at the outpatient level. Considering the role of **ama** in the pathogenesis of the condition, a one-week course of **ama pachana** medicines was administered to digest and eliminate ama. Following this, the patient was admitted to the inpatient department (IPD) for further treatment. Internally, a combination of **ama hara**, **medohara**, and **kaphahara** medications were given. For symptomatic relief, **lepana** was applied externally to alleviate pain in the knee joints and lower back. To address nerve damage and improve blood circulation in the lower limbs, **choorna pinda sweda** therapy and **udwarthana** were incorporated into the treatment plan. After the treatment course, the patient experienced significant relief from her lower back and knee joint pain, along with an improvement in numbness in both lower limbs and feet. Sensory function in her lower limbs and feet also improved notably.

Key words Diabetic neuropathy, Prameha, Choorna pinda Sweda, Udwarthana

Introduction

Diabetic neuropathy refers to a type of nerve damage that can occur in people with diabetes. Diabetic

neuropathy can manifest in various forms, affecting different types of nerves in the body. The 4 main types of diabetic neuropathy are peripheral neuropathy, Autonomic neuropathy, proximal neuropathy(diabetic poly radiculopathy), and focal neuropathy. Approximately half of individuals with diabetes experience some form of peripheral neuropathy (PN), which can manifest as either polyneuropathy or mononeuropathy. The onset and progression of neuropathy are closely linked to the duration of diabetes and the management of blood sugar levels.¹

Peripheral neuropathy is the most common type of diabetic neuropathy. Roughly half of individuals with diabetes develop some variation of peripheral neuropathy, encompassing either polyneuropathy or mononeuropathy.² Peripheral neuropathy often starts in the feet and legs and can gradually progress to the hands and arms. The most common clinical manifestations include diminished perception of vibration sensation distally, a 'glove and stocking' pattern of impairment affecting all other sensory modalities, and loss of tendon reflexes in the lower limbs. In symptomatic patients, sensory abnormalities are predominant. Typical symptoms encompass paraesthesia in the feet (and occasionally in the hands), lower limb pain characterized as dull, aching, or lancinating, often exacerbated at night and primarily felt on the anterior aspect of the legs. Additionally, patients may experience burning sensations in the soles of the feet, cutaneous hyperaesthesia, and, in severe cases, an abnormal gait (typically wide-based), often accompanied by a sensation of numbness in the feet. Weakness and atrophy, particularly affecting the interosseous muscles, may develop, leading to structural alterations in the foot, including loss of lateral and transverse arches, clawing of the toes, and exposure of the metatarsal heads.³

In *ayurveda*, according to opinions from various *acharyas*, diabetes is classified under the broad term *prameha* and this peripheral neuropathy is regarded as a *prameha upadrava*. *Prameha* is a disease characterized by the involvement of multiple *doshas* and *dushyas*, which can lead to numerous complications.⁴ When treating *prameha upadrava*, it is crucial to address all the *doshas* and *dushyas* implicated in the disease process. As we know, *upadravas* are morbid events that arise from the same factors responsible for the primary disease.⁵

Generally, *upadravas* subside when the *pradhana vyadhi* (primary disease) is treated. However, in some cases, the *upadravas* become so bothersome that they require specific attention alongside the treatment of the main disease. In such instances, the treatment of both *prameha* and its *upadravas* must be carried out simultaneously. Here the treatment aims to normalise the *doshas* and *dushyas* involved in the pathology of the disease.

Case report

48-year-old moderately built female patient came to Roganidana OPD with complaints of numbness of bilateral lower limb especially over the sole of foot and mid-calf region since- 8 years, Weakness of bilateral lower limb on walking since - 2months, knee joint pain bilaterally since-2 months and low back pain while getting up from bending posture- for 1 week.

History of present illness

48-year-old moderately built female patient developed burning sensation over bilateral foot, 10 years back. She applied some oil by herself and took *ayurvedic* medicines internally but had no improvement.

After 6 months, her right leg hit against a hard surface and had a wound on the distal part of the leg. As the wound was non-healing, she consulted a nearby hospital and was diagnosed with T2DM. She started to take medicines for DM regularly. 8 years before, the patient started to develop numbness of foot initially over the bilateral toe, gradually started to develop over the dorsal aspect of foot, around the malleolus, and the mid-calf region. She also noticed slipping of footwear frequently.

2 months before, she felt pricking pain over the right knee joint medially. Gradually, pain developed over the left knee joint also. The patient also noted weakness of lower limb while walking. Before one week, the patient developed pricking type of pain over the lowback region, which made her difficult to getting up from bending position.

H/O previous illness and treatment

Type 2 DM for 10 years, under medication

Personal history

Appetite- Reduced

Bowel-Regular- 1/day

Micturition- 5-6 times/day

Sleep- Sound

Allergy- Nil

Addictions- Nil

Diet- Mixed

Exercise- Moderate

Habits- Nil

CLINICAL FINDINGS

General examination

Built: Moderate

Nourishment: moderate

No pallor

No icterus

No cyanosis

No lymphadenopathy

No oedema

Physical examination

Lower limb-blackish scar marks of healed wounds present over bilateral leg

Systemic examination

Affected system - Locomotor system & Nervous system

Examination of spine

Cervical spine- Intact

Thoracic spine- Intact

Lumbosacral spine- Inspection-no swelling, normal curvature

Palpation- No tenderness

-No raise in temperature

ROM -Flexion possible without pain

-Extension-possible with pain

S.I joint- No abnormalities detected

Special tests

SLR test, Femoral nerve stretch test, Lasegue's test, pump handle test, Gaenslen's test, Gillis' test, flip test - Negative bilaterally

Knee joint

Right- No swelling, no redness

Grade 1 tenderness over medial aspect, no crepitus

Flexion-110 degree possible with pain, extension possible without pain

Left -Intact

No abnormalities detected over other joints

Motor system examination

Muscle tone and muscle power- Intact bilaterally

Reflexes- Knee +++ bilaterally

-Ankle + bilaterally

Sensory system examination- Lower limb bilaterally

Superficial

Pain, touch, temperature-impaired over bilateral foot, Bilateral lower limb below thigh

Deep

Pain-intact over bilateral calf

Vibration- Impaired bilaterally

Joint position- Impaired bilaterally

Combined

Two-point discrimination-impaired over bilateral foot

Graphesthesia-impaired bilaterally

Stereognosis impaired bilaterally

Peripheral pulses

Dorsalis pedis and posterior tibial pulse - feeble bilaterally

Ashtasthana Pareeksha

Nadi - Sadharanam

Mutram- Anavila

Malam- Prakritam

Jihwa- Anupalipita

Shabda - Spashta

Sparsha – Anushnaseeta

Drik - Sadharanam

Akriti - Madhyama

Lab investigations

On 02/07/24

FBS-132mg%

PPBS-261mg%

On 03/08/24

FBS-124mg/dl

PPBS – 170 mg/dl

Diagnosis- Prameha upadrava

Therapeutic intervention

OP management

Date	Complaints	Medicine	Remarks
25/06/24 to 01/07/24	1. Numbness of bilateral lower limb especially over the sole of foot and mid-calf region since-8years 2. Weakness of bilateral lower limb on walking since -2months	1. <i>Amrutotharam Kashayam</i> -90ml bd before food 2. <i>Varanadi Kashayam</i> -90ml bd after food 3. tab Nervace 1-0-1 after food	

IP management

Date	Complaints	Internal medicine	Procedure	Remarks
02/07/24 to 05/07/24	1. Numbness of bilateral lower limb especially over the sole of foot and mid-calf region 2. Weakness of bilateral	1. <i>Amrutotharam Kashayam</i> - 90ml bd before food 2. <i>Varanadi Kashayam</i> - 90ml bd after food 3. <i>Gandharveranda tailam</i> - 15ml before morning kashayam 4. tab Nervace-1-0-1 after	1. <i>Lepanam</i> with <i>Gruhadhuma</i> and <i>arikkadi</i> over bilateral knee, low back	Knee joint pain-right side reduced slightly (medial aspect)

	<p>1 lower limb on walking</p> <p>3.Knee joint pain bilaterally</p> <p>4.Low back pain while getting up from bending posture</p> <p>.</p>	<p>food</p>		
<p>06/07/24 to 11/07/24</p>	<p>Same</p>	<p>Repeated</p>	<p>1.<i>Lepanama</i></p> <p>2.<i>Choorna Pinda Sweda</i> with <i>Kolakulathadi choorna</i></p>	<p>1.Patient started to feel superficial pain over the left toe dorsally</p> <p>2.Numbness over the mid-calf region reduced bilaterally</p> <p>3. The patient started to feel sensation</p>

				of heat while applying hot water over bilateral calf region, bilateral foot
12/07/24 to 14/07/24	Same	Repeated	1. <i>Lepana</i> 2. <i>Udwardhana</i> with <i>Kolakulathadi choorna</i>	
15/07/24	Same	Repeated	Repeated	1. Superficial Pain- left foot- intact over dorsal aspect of foot, plantar aspect- intact over the great toe right foot- intact over dorsal aspect of foot 2. Touch- intact over bilateral foot and

				lower limb.
16/0 7/24	Same	Repeated	Repeated	3.Low back pain reduced, no tenderness over the spine, flexion extension possible without pain 4.Weakness over bilateral lower limb while walking reduced
17/0 7/24	Occasional numbness over bilateral mid-calf region, foot	Repeated	Repeated	1.Two-point discrimination-intact over the mid-calf region, right foot, in left foot impaired over the sole 2.Vibration-intact over the bilateral foot

				<p>3.Graphesthesia-intact over bilateral lower limb.</p> <p>4.Joint position-intact over right foot</p>
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Treatment after discharge

Date	Complaints	Internal medicines	Procedure	Remarks
18/7/24 to 02/08/24	Occasional numbness over bilateral mid-calf region, foot	<p>1.<i>Punarnavadi kashayam</i></p> <p>+</p> <p>2.<i>Gugguluthikthakam kashayam</i> - 90ml bd before food</p> <p>3.<i>Chandraprabha gutika</i> 2-0-2 with <i>kashayam</i></p> <p>4.<i>Gandharveranda tailam</i> -15ml with <i>jeeraka</i> water before morning <i>kashayam</i></p>	<p><i>Udwarthana</i> with <i>kolakulathadi choorna</i> -apply over bilateral lower limb with mild pressure</p>	<p>1.Two-point discrimination-intact over the mid-calf region, right foot, in left foot impaired over the sole</p> <p>2.Vibration-intact over the bilateral foot</p> <p>3.Graphesthesia-intact over bilateral lower limb.</p> <p>4.Joint</p>

				position-intact over right foot
1 st follow up on 03/08/24	Same	Above medicines and <i>Kanmada rasayana</i> 1 teaspoon with <i>khadira</i> water two times after food	Repeated	<p>1.Knee joint pain reduced bilaterally</p> <p>No tenderness</p> <p>ROM intact</p> <p>2.Superficial pain, touch intact over bilateral foot (dorsal aspect)</p> <p>Impaired over plantar aspect of 2nd-5th phalanges</p> <p>3.vibration , two-point discrimination intact over bilateral foot, lower limb</p> <p>FBS- 124mg/dl</p> <p>PPBS- 170</p>

				mg/dl
2 nd Foll ow up on 24/8 /24	Very mild numbn ess of foot persisti ng	<i>Kanmada rasayana</i> - 1 teaspoon with <i>khadira</i> water two times after food	-	1.Numbne ss over bilateral lower limb and thigh reduced 2.Superfici al touch and pain intact over plantar aspect of second and third phalanges of right foot

Results

Initially, the patient was managed at the outpatient level for one week. Following this, they were admitted to the Roganidana IPD for two weeks. After the two-week inpatient treatment, there was significant improvement in the patient's sensory system. Numbness and weakness in both lower limbs were reduced, and the patient regained the ability to feel superficial pain, touch, temperature, and vibration. Two-point discrimination and graphesthesia also became intact. Additionally, the bilateral knee and low back pain were alleviated.

Upon discharge, the patient was prescribed internal medications for two weeks. At the first follow-up after two weeks, a re-examination of the sensory system showed further improvement. Superficial pain and touch were intact on the dorsal aspects of both feet, and vibration and two-point discrimination were normal over both feet and lower limbs. On the same day, the fasting blood sugar (FBS) level was 124 mg/dl, and the postprandial blood sugar (PPBS) was 170 mg/dl. The second follow-up was done one week later. By that time, numbness in both lower limbs and thighs had further decreased, and superficial touch and pain were intact on the plantar aspect of the second and third toes of the right foot. The patient reported feeling happy and more confident.

Discussion

Diabetic peripheral neuropathy encompasses a wide spectrum of clinical conditions, often manifesting as dysfunction of the peripheral nervous system.⁶ Patients with peripheral neuropathy often experience a range of symptoms, including numbness, tingling, aching, burning sensations, limb weakness, and

heightened sensitivity to pain, such as hyperalgesia and allodynia. The associated pain can vary in nature, being described as superficial, deep-seated, or severe and persistent, with exacerbations often occurring at night.⁷

Management of diabetic peripheral neuropathy encompasses a range of strategies, including preventive measures such as patient education, proper foot care, appropriate footwear, and routine annual foot examinations. Additional key components include maintaining glucose control, making dietary adjustments, achieving weight loss, and managing pain effectively.⁸

In *ayurveda*, diabetes is correlated with the condition known as *prameha*. Its management includes both preventive and curative approaches.⁹ The primary factors involved in the pathogenesis of *prameha* are *kapha*, *mamsa*, *medas*, and *kleda*. As the disease progresses, additional components gradually contribute to its development. The vitiation of *kapha*, *medas*, and *kleda* can lead to *agnimandhya*, resulting in the formation of *ama*. Considering these factors, the initial treatment plan was formulated accordingly. At the OP level, *amrutotharam kashayam* and *varanadi kashayam* were prescribed for one week. *Amrutotharam kashayam*, which contains *nagara* (ginger), *amrutha* (*Guduchi*), and *hareethaki* (chebulic myrobalan), aids in *ama pachana*.¹⁰ *Amrutha* also has *rasayana* (rejuvenative) properties and helps regulate elevated blood sugar levels. *Varanadi kashayam* is a formulation designed to pacify vitiated *kapha* and *medas*, while also addressing *mandagni*, thereby supporting the restoration of digestive fire.¹¹

After one week, the patient was admitted to the inpatient department (IPD). *Amrutotharam kashayam* and *varanadi kashayam* were continued as part of the treatment. In addition, *gandharvahasthadi eranda tailam* was administered in the morning to support digestive and therapeutic functions. *Gandharvahasthadi eranda tailam* is a potent formulation which help to regulate the vitiated *apana vayu*. In *prameha*, the *sthana samsraya* occurs in the *vasti*, and the involvement of *apana vayu* is considered a key factor in the pathogenesis of the condition. *Chandraprabha Gutika*, administered to the patient, is renowned as *sarvaroga pranashini*, capable of addressing a wide range of ailments.¹² Its primary action is on the *mutravaha srotas*, helping to balance *vatha* and *kapha* doshas. With its *laghu* and *ruksha* qualities, *chandraprabha vati* aids in clearing accumulated *ama* from the *mutravaha srotas* and reducing excess *kleda*. Ingredients like *shilajatu* and *guggulu* possess *rasayana* (rejuvenative) properties, which help alleviate the symptoms associated with *prameha*. *Nishakathakadi kashayam* is a formulation which is effective in *prameha*.¹³ It is given as *vyadhiprathyaneeka* drug and all the key ingredients like *nisha*, *kathaka*, *nellikka*, *thechi*, etc are effective for controlling diabetes.

As *kriyakrama*, one-week *Choorna Pinda Sweda CPS* (*Ruksha*) was given. CPS is one type of *ruksha sankara sweda* comprising *ruksha*, *ushna*, and *tikshna* properties.¹⁴ In *swedana karma* heat is applied for the purpose of increasing vasodilation, decreasing viscosity of the blood, changing nerve conduction, reducing pain and heaviness in the body.¹⁴ *Ushna guna* of *swedana* causes stimulation of sympathetic nervous system and causes vasodilation.¹⁴ *Udwarthanam* is a therapy which is effective in reducing *kapha*, *medas* in the body. It's a deep tissue massage which activates the blood flow, stimulate the nervous system and nerve endings. It helps in reducing the *kapha-vatha* dosha. *Lepana* with *gruhadhumadi choornam* helps to reduce the localised swelling and pain. It pacifies the *vatha-kapha doshas*.¹⁵

After

discharge the patient was given *punarnavadi kashayam*, the formulation has *pachana* properties and action on *mutravaha srotas*.¹⁶ *Guggulu thiktakam kashayam* was also given which was mentioned in *vatha vyadhi* and having action on *asthi and majja dhatus*. It enhances strength, promote healing.¹⁷

Ingredients like *amrutha and guggulu* are having *rasayana* properties. After correcting *agni, rasayana chikitsa* has been planned. For that *kanmada* processed in *thriphala kashaya* was selected. *Kanmada* helps to reduce the *avarana* caused by aggravated *kapha*, and *medas*. It also has action on *mutravaha srotas*. It is effective in controlling the symptoms associated with diabetic neuropathy.¹⁸

Conclusion

Diabetic neuropathies are common complications of diabetes. They may be due to diabetic microvascular injury involving the small blood vessels that supplying the nerves. Though there are many treatment modalities for diabetes, the patients do not get proper solution for their neuropathic complications. Hence there is a need to find out safer and effective treatment for these complaints.

In *ayurveda*, the symptoms like *supthata* (numbness), and *daha* (burning sensation) in the body are described as the *purvarupa* of *prameha*. *Daha* also described among the *upadravas* of *prameha*. *Samprapthi vighatana* is the treatment for any diseases. Normalising the *doshas* and *dushyas* involved in the pathogenesis of *prameha*, help to control the neuropathic complications.

In this case study, the patient has been treated with *kapha medohara, agni vardhaka, and mutrala* drugs internally and *rukshana* therapies externally to reduce the *avarana* caused by aggravated *kapha* and *medas*. After discharge, the patient got considerable relief from neuropathic symptoms like numbness. Sensory system improved. Patient started to feel pain, touch, temperature, vibration over bilateral lower limb and foot.

Patient perspective

The patient shared her perspective in her native language, Malayalam. She expressed that the treatment not only alleviated her health issues but also boosted her confidence.

Informed consent

Informed consent has been obtained from the patient for the publication of this case and clinical data. The patient has been assured that their identity will remain confidential, with no publication of names or initials, and every effort was made to safeguard their anonymity.

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