

Ayurveda Management in Diabetic Neuropathy vis-à-vis Prameha Upadrava—A Case Study

Case Report

Shweta Kodre^{1*}, Jibi Varghese², Khan Aqsa Zarin¹, Snehal Pansare¹,
Mohini Niware¹, Shreya Bhatia¹, Manna Mathew⁷

1. P.G. Scholar, 2. Professor, Department of Kayachikitsa, Dr. D.Y. Patil College of Ayurved & Research Center, Dr. D. Y Patil Vidyapeeth (Deemed to be University) Pimpri-Pune, India.
7. Ayurveda Practitioner, Pune. India.

Abstract

Background: Diabetes mellitus (DM) in India has a higher prevalence (4.3%) than in the west (1-2%) and its complication rate is also high. Diabetic neuropathy symptoms include pain, numbness, reduced sensation of touch or oversensitivity, uncomfortable tingling and burning, skin ulcer and reduced reflexes. Diabetic neuropathies are seen in approximately 50% of individuals with long standing type 1 and type 2 DM and it often goes undiagnosed. This article presents a case study of patient with signs and symptoms of neuropathy who came with the complaint of lower back pain, bilateral lower limb pain, pricking sensation and burning sensation. Diabetic Neuropathy Examination score (DNE) along with other neuropathy screening parameters was more than 60% indicating functional loss. The Nerve conduction study also revealed demyelinating polyneuropathy. Observations and Results: The patient was treated with *ayurvedic* oral medication, *Abhyanga* (~application of medicated oils), *swedana* (~fomentation), and *basti* (~medicated enema). After *ayurvedic* treatment the patient showed good remission in pain, burning sensation and DNE along with all neuropathy screening were less than 20%. Patient got marked relief in all the symptoms.

Keywords: Diabetes Mellites, *Prameha upadrava*, *Basti*, Diabetic neuropathy.

Introduction

Diabetic Neuropathy (DN) is the presence of symptoms and or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes. (1) Neuropathic pain is the most challenging issue of DN, as it is progressive disorder of the nerve and if left untreated it can lead to loss of balance, loss of dexterity and at later stage amputation of limbs. In modern medicine, it is treated with gabapentin, pregabalin, centrally acting opioid analgesic (like tapentadol). (2) Despite these modern medications, patients get relieved only for a short period of time and thus get dependent on analgesics. As the diabetic neuropathy needs long term treatment many side-effects are observed with the consumption of these medications.

Diabetic neuropathy can be approximately correlated with *prameha* and its *upadrava* (~complications). Symptoms like *karapada sputatadaha* (~numbness and burning of limbs), *shatpadapipalika* (~tingling sensation) are found in *Purvarupa* (~prodromal) of *prameha*. *Daha* (burning),

shoola (pain), *baddhapurisha* (constipation) these symptoms are found as *upadrava* (complication) of *prameha*. *Prameha* is *tridoshaj vyadhi* (~all 3 vitiated *doshas*) and with its complication it becomes *asadhya* (~incurable). But with early diagnosis and initiating *ayurvedic* treatment from the start it becomes *yapya* (~manageable).

Prameha upadrava needs a dual line of treatment, for *prameha* which is mainly kapha and kleda reducing and for its complications, which depend on vitiated *doshas*, in this case *vata-pitta*.

Present case showed symptoms of *vata-pittaj prameha upadrava* and it was treated according to *ayurvedic* line of treatment as per the respective *doshas*. This case study highlights *ayurvedic* treatment for pain and burning sensation in DN.

Assessment criteria

Objective Parameters

- Diabetic neuropathy examination (3)
- Michigan Neuropathy Screening Instrument (MNSI) (4)
- Toronto Clinical Neuropathy Score (TCNS) (5)
- Diabetic Neuropathy Symptom Score (DNS) (6)(7).

Case Report

A 65-year-old male patient Indian, married, non-smoking, non-alcoholic with a history of tobacco addiction came to the outpatient department on 22/3/22 with complaints of low back pain, bilateral lower limb pain with pricking sensation and burning sensation

* Corresponding Author:

Shweta Kodre

Post Graduate Scholar, Department of Kayachikitsa, Dr. D.Y. Patil College of Ayurved and Research Centre, Dr. D.Y. Patil Vidyapeeth (Deemed to be university), Pimpri, Pune411018, Maharashtra. India.
Email Id: shwetakodre608@gmail.com

Shweta Kodre et.al., Ayurveda Management in Diabetic Neuropathy vis-à-vis Prameha Upadrava – A Case Study

increasing at night along with difficulty in walking without support. Also, there was numbness in the palms of both hands and pain in the flexion and extension of knees. He was diagnosed with type 2 diabetes 10 years back and was on the tablet Metformin 500mg once a day, but he was not taking it regularly. Since April 2021 the patient had tingling sensation and weakness in lower limbs but it was not attended properly. After 2-3 months, the symptoms of weakness progressed so he went to the local orthopedic doctor, who advised for an MRI and nerve conduction study. Patient was advised with allopathic medicines and he took the treatment for 5 months. Patient was not satisfied with the treatment, so he approached for ayurvedic management. (Table 1)

Clinical findings

On the day of the examination, the patient was brought by his relatives in a wheelchair. The patient was lean built, conscious and obeying verbal command. The patient had wasting of muscles at the thigh region, reduced motor power of both lower limbs with grades 3 out of 5 as per the Medical Research Council Scale. Knee joint and ankle joint reflexes were reduced. Cranial examinations were evaluated as normal. In the

Sensory examination, the patient was unable to tolerate even light pressure applied on lower limbs. Vibration and temperature perception were present but decreased. Vibration perception was delayed in the lower limb by 3-4 seconds than the upper limb. Lower limb deep tendon reflexes of knee and ankle joints were reduced. The patient could not walk without the support and after 50-60 meters of walking he would feel the urge to take rest. The patient had difficulty in performing his daily routine activities. Systemic examination was normal with cardiovascular system S1 S2 Heard, Abdomen was hard with tenderness in epigastric region and in respiratory system Air entry bilaterally equal.

Drug History

Patient went to local doctor; they gave medications as mentioned below:

Capsule Omepraz D once a day, Tablet Arthraspaz once a day, Tablet Phlogam once a day, Tablet Pregawell once a day, Tablet Kinetozyme D once a day, Injection Arachitol 6L IU IM, Injection B 29 AQ 500 mcg IM once a week for 4 weeks.

Table 1: Timeline presenting clinical symptomatology of the patient and interventions

Year / Date	Clinical events and interventions
2012	Diagnosed with type 2 diabetes mellitus
2012-2021	History of on and off burning sensation and nocturnal urination also the patient was not taking diabetes medication regularly but no major illness.
Since April 2021	Tingling sensation and weakness in lower limb. Took allopathic medication for 5 months but weakness increased gradually.
23/3/22	Patient came to the outpatient department with the same complaints and was admitted in IPD for further management.
25/3/22	Postprandial sugar 260 mg/dl (DNE-8, DNS-4, MNSI-1, TCNS-14)
24/3/22- 31/3/22	Procedures <i>abhyanga</i> , <i>pinda sweda</i> , <i>yoga basti</i> started along with internal medication <i>madhumehari vati</i> , <i>ksheerabala capsule</i> , <i>capsule palsineuron</i> , <i>eranda taila</i> and <i>balarishta</i>
1/4/22- 16/4/22	Along with <i>abhyanga</i> and <i>pinda sweda</i> , <i>panchatikta ksheera basti</i> was added. Oral medications were continued as it is.
17/4/22- 22/4/22	Only oral medication with <i>abhyanga</i> and <i>pinda sweda</i> was continued.
22/4/22	Patient discharged from IPD and advised oral medication for one month (Postprandial sugar 148 mg/dl, DNE-2, DNS-1, MNSI-0.5, TCNS-6).

DNE-Diabetic neuropathy examination; MNSI-Michigan Neuropathy Screening Instrument; TCNS-Toronto Clinical Neuropathy Score; DNS-Diabetic Neuropathy Symptom Score; IPD- In patient department.

Ayurveda parameters

Patient's *Nadi* (Pulse) was *Vata* dominant, *Mutra* (Urine) burning micturition, *Mala* (Bowel) constipation, *Jivha* (Tongue) coated, *Shabda* (Speech) Normal speech, *Sparsha* (Touch) *asamyak sparsha* (Impaired sensation) in lower limbs, *Druk* (Eyes) normal, *Akruti* (Built) lean.

Diagnostic testing

Routine lab investigation (dated 25/3/22) were ESR- 25mm/hr, RA factor- 4.5 IU/ml Hemogram-Hb-15.3gm/dl; RBC count- 5.24mil/cmm; Platelet count- 1.55 lakhs/cmm; WBC-5700/Cmm, BSL (F)-

126 mg/dl; BSL (PP)-260 mg/dl, BUL- 15 mg/dl, Uric acid- 3.5 mg/dl, Sr. creatinine- 0.82 mg/dl.

MRI spine (dated 22/6/21) suggests degenerative changes in the form of osteophytes. At L4-5 and L5-S1 levels, diffuse disc bulge facet joint arthropathy and ligamentum flavum hypertrophy is causing canal stenosis thecal sac. Bilateral foraminal narrowing at L4-5 and L5-S1 level.

EMG/NCV Report (dated 23/7/21) 'F' wave delayed. There is electrodiagnostic evidence of a sensory-motor axonal and demyelinating polyneuropathy affecting lower limbs>upper limbs.

Diagnosis

Based on a history of diabetes (not taking medication regularly), physical examination (like DNE, DNS) and clinical findings the patient was diagnosed with diabetic neuropathy. Patient had symptoms of pain, burning sensation and prickling sensation in the distal part, in typical “stoking-gloves” pattern. Diabetic neuropathy is a diagnosis of exclusion. (8) Radiculopathy was ruled out as in MRI there was no significant nerve root compression. Other causes for neuropathy like Nutritional (B12 deficiency) was ruled out as the patient has taken sufficient supplements. Patient was non-alcoholic and rheumatologic (SLE, rheumatoid arthritis, vasculitis) investigations were negative. Exclusion of all other causes supported the diagnosis of diabetic neuropathy.

For diagnosis and analysis, DNE was applied. It is modified from the NDS (Neuropathy Disability Score) and as it is fast, easy to perform, and sensitive for neuropathy. (9) It was chosen for analysis as before and after treatment combined with other neuropathy scores.

Even with the modern diagnosis, status of the patient from ayurvedic perspective is necessary to treat any disease. In ayurvedic perspective, patient was

diagnosed as *prameha upadrava* with manifestation of *Daha* (~burning), *shoola* (~pain), *baddhapurisha* (~constipation). And it was mainly *vata-pitta* in type, as the *daha*, *shoola* were one of the persistent symptoms. Also, major *vata* vitiation was there, as the patient was in *vridhavastha* (~old age), *krusha* (~lean) and *durbala* (~weak).

Therapeutic interventions

Considering *vata pradhanya* (~*vata* vitiation), chronicity of disease, *vridhavastha* (~old age), *krusha* (~lean built) and demyelination of nerves capsule *ksheerabala* (10) and cap palsineuron (11) was selected for internal medication. *Madhumehahar vati* (12) was selected to control *prameha*. *Eranda taila* (13) is *agnivardhaka* (~increase digestive power), it also reduces pain and was used during treatment to combat constipation. *Balarishta* (14) is *vata shamaka* (~alleviate *vata*), *agni vardhak* (~increases digestion power) and gives *bala* (~increases strength). (Table 2). *Snehana* with *mahanarayan taila*, *pinda swedana*, *yoga basti* then *ksheerbasti* were done on the patient (Table 3). Allopathic medication (Tablet metformin 500 mg) which the patient was taking for glycemic control, was continued during treatment.

Table 2: Internal medication

Medicine	Contents	Dose	Time of administration
Capsule palsineuron (S G Phyto Pharma Pvt Ltd)	<i>Mahavataavidhwansa</i> , <i>Samirpannaga</i> , <i>Ekanvir rasa</i> , <i>Khursani Ova</i> (<i>Hyoscyamus niger</i> Linn.), <i>Lajjalu</i> (<i>Mimosa pudica</i> Linn.), <i>Sootshekhar Rasa</i>	1 cap 500 mg thrice a day	Before meal
<i>Madhumehahar vati</i> (AyuRemedies)	<i>Mamajjak</i> (<i>Enicostemma littorale</i> Blume), <i>Meshashringi</i> (<i>Gymnema sylvestre</i> RBr), <i>Latakaranja</i> (<i>Caesalpinia bonducella</i> (Linn.) Roxb.), <i>Latakaranja</i> (<i>Caesalpinia bonducella</i> (Linn.) Roxb.), <i>Pippali</i> (<i>Piper longum</i> Linn.), <i>Rakta maricha</i> (<i>Capsicum frutescens</i> Linn.), <i>Indravaruni</i> (<i>Citrullus colocynthis</i> Linn.)	2 tabs 250 mg twice a day	Before meal
<i>Eranda taila</i> (Sudhatatva phar.)	Castor oil (<i>Ricinus communis</i> Linn.)	10 ml	At night
Capsule <i>Ksheerabala</i> (Nagarjuna)	<i>Ksheerabala</i> (<i>Sida cordifolia</i> Linn.) oil encased in capsule	2 Cap 500 mg twice a day	Before meal
<i>Balarishta</i> (Baidyanath)	<i>Bala</i> (<i>Sida cordifolia</i> Linn.), <i>Ashwagandha</i> (<i>Withania somnifera</i> Dunal), <i>Guda</i> (<i>Saccharum officinarum</i> Linn.), <i>Dhataki</i> (<i>Woodfordia fruticosa</i> (Linn.) kurz.), <i>Rasna</i> (<i>Alpinia calcarata</i> Willd.), <i>Ela</i> (<i>Elettaria cardamom</i> Maton.), <i>Prasarani</i> (<i>Paederia foetida</i> Linn.), <i>Ushira</i> (<i>Vetiveria zizanioides</i> Linn.), <i>Eranda</i> (<i>Ricinus communis</i> Linn.), <i>Gokshura</i> (<i>Tribulus terrestris</i> Linn.)	20 ml twice a day	After meal

Table 3: Panchakarma Therapy

Procedure	Medicine	Content	Duration
<i>Snehana</i> (~oil massage)	<i>Mahanarayan taila</i>	<i>Bilva</i> (<i>Aegle Marmelos</i> (L.) Corr. Serr.), <i>Ashwagandha</i> (<i>Withania Somnifera</i> Dunal), <i>Brihati</i> (<i>Solanum Indicum</i> Linn.), <i>Gokshura</i> (<i>Tribulus Terrestris</i> Linn.), <i>Shyonaka</i> (<i>Oroxylum Indicum</i> Vent.), <i>Bala</i> (<i>Sida Cordifolia</i> Linn.), <i>Neem</i> (<i>Azadirachta Indica</i> A. Juss.), <i>Kantakari</i> (<i>Solanum Xanthocarpum</i> Burm.), <i>Punarnava</i> (<i>Boerhavia Diffusa</i> Linn.), <i>Atibala</i> (<i>Abutilon Indicum</i> Linn.), <i>Agnimantha</i> (<i>Premna serratifolia</i> Linn.), <i>Prasarini</i> (<i>Paederia Foetida</i> Linn.), <i>Patala</i> (<i>Stereospermum Suaveolens</i> Roxb.)	24/3/22-22/4/22

Shweta Kodre et.al., Ayurveda Management in Diabetic Neuropathy vis-à-vis Prameha Upadrava – A Case Study

<i>Swedana</i> (~fomentation)	<i>Shashti shali pinda swedana</i>	<i>Shashti shali</i> rice cooked in milk processed with <i>Bala</i> (<i>Sida cordifolia</i> Linn.) and <i>Guduchi</i> (<i>Tinospora cordifolia</i> Willd.)	24/3/22-22/4/22
<i>Matra basti</i> (~enema with oil)	<i>Dashamula taila</i> (<i>yoga basti</i>)	<i>Shaliparni</i> (<i>Desmodium gangeticum</i> (L.) DC.), <i>Prushniparni</i> (<i>Uraria picta</i> Jacq.), <i>brihati</i> (<i>Solanum indicum</i> Linn.), <i>kantakari</i> (<i>Solanum xanthocarpum</i> Burm), <i>gokshura</i> (<i>Tribulus terrestris</i> Linn.), <i>Bilva</i> (<i>Aegle marmelos</i> (L.) Corr. Serr.), <i>Gambhari</i> (<i>Gmelina beechwood</i> Roxb.), <i>Patala</i> (<i>Stereospermum suaveolens</i> Roxb.), <i>Agnimantha</i> (<i>Premna serratifolia</i> Linn.), <i>Syonaka</i> (<i>Oroxylum indicum</i> (L.) Kurz.) <i>tila taila</i> (<i>Sesamum indicum</i> Linn.)	24/3/22-31/3/22 For 8 days on alternate day with <i>niruha basti</i>
<i>Niruha basti</i> (~enema with decoction)	<i>Dashamuladi niruha</i> (<i>yoga basti</i>)	<i>Kwath- Dashamula</i> ((<i>Shaliparni</i> (<i>Desmodium gangeticum</i> (L.) DC.), <i>Prushniparni</i> (<i>Uraria picta</i> Jacq.), <i>brihati</i> (<i>Solanum indicum</i> Linn.), <i>kantakari</i> (<i>Solanum xanthocarpum</i> Burm), <i>gokshura</i> (<i>Tribulus terrestris</i> Linn.), <i>Bilva</i> (<i>Aegle marmelos</i> (L.) Corr. Serr.), <i>Gambhari</i> (<i>Gmelina beechwood</i> Roxb.), <i>Patala</i> (<i>Stereospermum suaveolens</i> Roxb.), <i>Agnimantha</i> (<i>Premna serratifolia</i> Linn.), <i>Syonaka</i> (<i>Oroxylum indicum</i> (L.) Kurz.) <i>tila taila</i> (<i>Sesamum indicum</i> Linn.)) (equal quantity). <i>Kalka- yavani</i> (<i>Trachyspermum ammi</i> Linn.), <i>Bilva</i> (<i>Aegle marmelos</i> (L.) Corr. Serr.), <i>madanaphala</i> (<i>Randia Spinosa</i> Poir.), <i>kushtha</i> (<i>Saussurea lappa</i> Falc.), <i>vacha</i> (<i>Acorus calamus</i> Pennel), <i>shtavha</i> (<i>Pimpinella anisum</i> L.), <i>pippali</i> (<i>Piper longum</i> L.), <i>musta</i> (<i>Cyperus rotundus</i> L.), <i>kanji</i> , <i>mansa rasa</i> , <i>Sarpi</i> (<i>Ghruta</i>), <i>vasa</i> (muscle fat), <i>majja</i> (bone marrow) (15)	24/3/22-31/3/22 For 8 days on alternate day with <i>matra basti</i>
<i>Kshira basti</i> (~enema with decoction made from milk)	<i>Panchatikata Kshira basti</i>	<i>Guduchi</i> (<i>Tinospora cordifolia</i> Willd.), <i>Nimba</i> (<i>Azadirachta indica</i> A. Juss.) <i>Vasa</i> (<i>Adhatoda vasica</i> L.), <i>Kantakari</i> (<i>Solanum Surattense</i> Burm.), <i>Patola</i> (<i>Trichosanthes dioica</i> Roxb.), <i>Kshira</i> (Milk) <i>Goghrita</i> (<i>Ghee</i>), <i>Madhu</i> (Honey)	1/4/22- 16/4/22

Snehana (~oil massage) was advised with *Mahanarayan taila* for 45 min. *Samvahana* (~gentle massage) was performed as the patient was unable to tolerate much pressure. After *snehana*, *Shashti shali pinda Swedana* was given for 20 min. Each treatment was conducted for 30 days. After *snehana* and *swedana*, *yoga basti karma* was followed with alternate *matra basti* with *Dashamula taila* and *niruha basti* with *Dashamuladi niruha* for 8 days. *Matra basti* (60 ml) was given after food with Luke-warm *Dashamula taila* (total 5 in number) and *niruha basti* (780 ml) was given empty stomach with *Dashamuladi niruha* (total 3 in number). After *yoga basti karma Panchatikata Kshira basti* (120 ml) was given for 16 days.

Assessment

Table 4: Diabetic Neuropathy Examination

Symptom	Before	After	Scoring
Quadriceps femoris: extension of the knee	1	1	0 = Normal 1 = Mild/moderate deficit • Muscle strength: Medical Research Council scale 3–4 • Reflex: decreased but present • Sensation: decreased but present 2=Severely disturbed/absent • Muscle strength: Medical Research Council scale 0–2 • Reflex: absent • Sensation: absent
Tibialis anterior: dorsiflexion of the foot	1	0	
Reflex: Triceps surae	1	1	
Index finger: Sensitivity to pinpricks	1	0	
Big toe: Sensitivity to pinpricks	1	0	
Big toe: Sensitivity to touch	1	0	
Big toe: Vibration perception	1	0	
Big toe: Sensitivity to joint position	1	0	

Table 5: Diabetic neuropathy symptom score

Symptom	Before	After	Scoring
Unsteadiness on walking	1	0	1=Present 0=Absent
Numbness	1	1	
Burning and aching pain	1	0	
Pricking sensation	1	0	

Table 6: Michigan Neuropathy Screening Instrument

Symptom	Before	After	Scoring
Appearance of feet	0	0	0=Normal; 1=Abnormal
Ulceration	0	0	0=Normal; 1=Abnormal
Ankle reflexes	0.5	0.5	0=Present; 0.5=Reduced; 1=Absent
Vibration perception	0.5	0	0=Present; 0.5=Reduced; 1=Absent

Table 7: Toronto Clinical Neuropathy Score

Symptom	Before treatment	After treatment	Scoring
Pain	1	0	1=Present 0=Absent
Numbness	1	1	
Tingling sensation	1	1	
Weakness	1	0	
Ataxia	1	0	
Upper limb symptoms	1	0	
Reflex			
Knee reflex-right	1	1	0=Normal 1=Reduced 2=Absent
Knee reflex-left	1	1	
Ankle reflex-right	1	1	
Ankle reflex-left	1	1	
Sensory test score			
Pinprick	1	0	0=Normal 1=Abnormal
Temperature	1	0	
Light touch	1	0	
Vibration	1	0	

Table 8: Comparative outcome of assessment scores

Name of the score	Before treatment	After treatment
DNE	8	2
DNS	4	1
MNSI	1	0.5
TCNS	14	6

Discussion

In the present case study of diabetic neuropathy patient showed symptoms of *vata-pittaj prameha upadrava*. *Vata* vitiated symptoms like pain, pricking sensation, ataxia, numbness, and atrophy were more dominant than *pitta*. So, the treatment was planned to pacify the dominant *vata* dosha. The line of treatment for *prameha vyadhi* goes in two parts: *sthoola pramehi* (~obese and strong) and *krusha pramehi* (~emaciated and weak). *Krusha pramehi* is advised *brumhana therapy* (~increasing bulk of body/increasing nourishment of body) (16). The patient was in *vridhavastha* (~old age), *durbala* (~weak) and *krusha* (~lean built), so by analyzing the status of patient, brimhana treatment which gives *bala* (~strength) and which pacifies *vata* and *pitta* was opted as a line of treatment in this case.

Internal medication

- *Capsule Palsineuron*: All contents in capsule *palsineuron* are used in *vata vyadhi* (~*vata* vitiated

disease) like sciatica, nerve injury, neuralgia (nerve pain), myalgia (muscle pain), and other neurodegenerative disorders. It collectively improves metabolic processes in CNS and PNS, activates neuro-muscular communication improves tissue oxidation and regulates blood supply in affected areas, promotes healing of damaged nerves and blood vessels and provides nutritional support for faster healing of damaged tissues. (17)

- *Madhumehari vati*: *Madhumehari vati* was used to improve cardinal symptoms of *prameha* like burning sensation in limbs, polydipsia, flaccidity of body parts, numbness of lower limbs (18).
- *Capsule ksheerabala*: *Ksheerabala* oil is *vata-pitta shamaka* (~pacify *vata* and *pitta*). It is a prime rejuvenator (~*rasayan*), so it helps in demyelination of nerves. It relieves burning sensation and improves sensory perception (~*indriya prasadana*). (19) It is known to have neuroprotective properties and hence reduce nerve irritation and inflammation. (20)
- *Balarishta*: *Balarishta* contains many drugs which work to relieve pain, regenerate nerve destruction and

as *balarishtha* is *balya* in nature, it is beneficial to patients in *vridhavastha* (~old age). Some contents like *Bala* and *Ashwagandha* have *rasayan* (~rejuvenation) properties and *Dhataki* has sedative properties; all together work on neurological pain. *Eranda* and *Rasna* have antioxidants, they neutralize harmful free radicals in our bodies thereby healing nerve damage. Some contents like *gokshura*, *eranda*, *prasarini* are anti-diabetic in nature. *Usira* is nerve relaxant and removes heat from the body, all collectively works as sedative, anti-diabetic and rejuvenate. (21)

- *Eranda taila*: As the patient was suffering from constipation *eranda taila* was used as *sneha virechana* (~oleaginous therapeutic purgation).

Panchakarma

- *Snehana*: *Mahanarayan taila* is *katu*, *tikta* in *rasa* (~pungent and bitter taste) and *ushna virya* (~Hot potency), by these properties it reduces *vata*, increases blood circulation thereby giving a soothing effect for neurological pain. Also, it is *vata kapha shamaka* (~pacify *vata* and *kapha*), so ultimately with other properties it leads to *deepana* (~increase digestive fire), *pachana* (~digestive), *strotoshodhana* (~cleans bodily channels) and *amapachana* (~digestion/neutralization of *Ama*). (22) Altogether it reduces *vata* but does not increase *kleda* which is responsible for *prameha*.
- *Swedana*: Though in the *samhita*'s *swedana* is contraindicated in *Prameha*, but as per the present condition of the patient with muscle wasting, physical weakness with a chronicity of 10 years, *swedana* was administered as a *paschat karma* to *snehana karma* as per the classics. *Shashti shali pinda sweda* is *Brumhana* (~increase muscle mass and nourishment), *Vatahara* (~*vata* alleviating) and *Balya* (~Strength promoter). Milk and *Shashti Shali* nourishes and gives strength to muscle tissues. *Bala* is potent in alleviating *vata*. *Guduchi* balances *tridosha* and it is *rasayana*. *Guduchi* is highly rich in antioxidants and has wound healing properties. Collectively it reduces the vitiated *vata dosha* and rejuvenates nervous tissues and reduces pain.
- *Yoga basti karma*: *Matra basti* was given with *Dashamula taila*. *Dashamula taila* is *Tridosha shamaka* (~balances all three doshas). It also brings about *anulomana* (~Downward movement) of *vata* thereby reducing *vata* vitiated symptoms like pain, tingling sensation, numbness etc. Also, *Dashamoola* has anti-inflammatory, analgesic, and antipyretic actions. (23) *Niruha basti* is one of the five *shodhana karma* (~detoxification) of *ayurveda*. *Dashamuladi niruha* was given to the patient. (24) It is *sarvadhoshahara* (~alleviates all 3 doshas). It contains *dashamula kashay* (~decoction) with *mansa rasa* (~medicated meat soup) and *sneha dravya* like *ghruta*, *majja*. It removes *strotas avarodha* (~cleans bodily channels) simultaneously giving *poshana* (~nutrition).

- *Kshira basti*: *Panchatikata kshira basti* is useful in alleviating *pitta dosha* related symptoms like burning sensation of legs because it contains *tikta rasa* and *kshira* (milk). *Tikta rasa* is *sukshma strotogami* (~penetrates minute channels), *agni deepak* (~increases metabolic stage) and because of these properties, *dhatu poshana* (~nutrition to all *dhatu*s) increases.

Conclusion

Diabetic neuropathy is a diagnosis by exclusion, and so often remains undiagnosed, and when diagnosed it attains irreversible nerve damage. The patient came with severe peripheral nerve damage and atrophy of muscles, but with continuous *panchakarma* and *ayurvedic* medication the pain, pricking and burning sensation reduced. *Balya* and *Rasayan* medication increased the strength and nutrition of the muscles and improved the motor functions preventing further damage of the nerves. With the treatment the patient was able to walk without support and was also able to do his daily activities on his own.

Future Scope of study - As this is a single case this treatment protocol can be conducted on a large sample size for a long duration of time to prove effectiveness of *prameha upadrava chikitsa* principles.

References

1. Andrew Boulton J.M, Arthur Vinik I, Joseph Arezzo C, Vera Bril, Eva Feldman L, Roy Freeman et al; Diabetic Neuropathies: A statement by the American Diabetes Association. *Diabetes Care*. 1 April 2005; 28(4); 956–962. <https://doi.org/10.2337/diacare.28.4.956>
2. Praveen A, Mathew G. K. *Medicine: Prep manual for Undergraduates*. 6th ed. Elsevier India; 2019. 1041–1042p.
3. Meijer J. W, Van Sonderen E, Blaauwweikel E. E, Smit A. J, Groothoff J. W, Eisma W. H. et al; Diabetic neuropathy examination: a hierarchical scoring system to diagnose distal polyneuropathy in diabetes. *Diabetes Care*. 1 June 2000; 23 (6); 750–753. <https://doi.org/10.2337/diacare.23.6.750>
4. Herman W. H, Pop-Busui R, Braffett B. H, Martin C. L, Cleary P. A, Albers J. W. et al; Use of the Michigan Neuropathy Screening Instrument as a measure of distal symmetrical peripheral neuropathy in Type 1 diabetes: results from the Diabetes Control and Complications Trial/ Epidemiology of Diabetes Interventions and Complications. *Diabet Med*. 14 March 2012; 29(7); 937–944 <https://doi.org/10.1111/j.1464-5491.2012.03644.x>
5. Abraham A, Barnett C, Katzberg H. D, Lovblom L. E, Perkins B. A, Bril V; Clinical Neuropathy Score is valid for a wide spectrum of polyneuropathies. *Eur J Neurol*. 2018; 25(3); 484-490. <https://doi.org/10.1111/ene.13533>
6. Meijer JW, Smit AJ, Sonderen EV, Groothoff JW, Eisma WH, Links TP; Symptom scoring systems to diagnose distal polyneuropathy in diabetes: The

- Diabetic Neuropathy Symptom score. *Diabet Med.* 2002; 19(11); 962-5. doi: 10.1046/j.1464-5491.2002.00819.x.
7. Rao SK, Indu S, Kumar PP, Nair PG, Radhakrishnan P; Management of diabetic peripheral neuropathy through Ayurveda. *J Ayurveda Case Rep.* 2020; 3(1); 30-4. DOI: 10.4103/JACR.JACR_2_20
 8. Pop-Busui R, Boulton A. J, Feldman E. L, Bril V, Freeman R, Malik R. A, Sosenko J. M. et al; Diabetic Neuropathy: A Position Statement by the American Diabetes Association. *Diabetes care.* January 2017; 40(1); 136–154. <https://doi.org/10.2337/dc16-2042>
 9. Afifi L, Abdelalim AM, Ashour AS, Al-Athwari A; Correlation between clinical neuropathy scores and nerve conduction studies in patients with diabetic peripheral neuropathy. *Egypt J Neurol Psychiatry Neurosurg.* 2016; 53(4); 248-52. DOI: 10.4103/1110-1083.202386
 10. Hari Sadasiva Sastri Paradakara editor. *Astaghridaya of Vagbhata.* Varanasi: Chaukhamba sanskrit sansthan; 2015. 732p.
 11. Wajpeyi S. M; Role of Ayurveda in the Management of Guillain-Barré Syndrome. *Int. j. Ayurvedic med.* 2019; 9(4); 288–292. <https://doi.org/10.47552/ijam.v9i4.1154>
 12. Sharma S, Dave A, Vasishth B, Sharma V; A clinical study to evaluate the role of Madhumehari Vati in the management of Madhumeha type 2 diabetes. *Int J Adv Med.* 2021; 8(4); 574-579. doi:<http://dx.doi.org/10.18203/2349-3933.ijam20211058>
 13. Pandey G.S. editor. *Bhavaprakasa Nighantu of Sri Bhavamisra.* Varanasi: chaukhamba bharati academy; 2015. 765p.
 14. Sharma R, Sharma S. *Sahastrayogam (Hindi).* Delhi: chaukhamba sanskrit pratishthan; 2016. 166P.
 15. Hari Sadasiva Sastri Paradakara editor. *Astaghridaya of Vagbhata.* Varanasi: Chaukhamba sanskrit sansthan; 2015. 754P.
 16. Harish Kushwaha C.S. editor. *Caraka Samhita of chakrapanidatta.* varanasi: chaukhamba orientalia; 2018. Vol 2, 187P.
 17. Wajpeyi S. M; Role of Ayurveda in the Management of Guillain-Barré Syndrome. *Int. j. Ayurvedic med.* 2019; 9(4); 288–292. <https://doi.org/10.47552/ijam.v9i4.1154>
 18. Sharma S, Dave A, Vasishth B, Sharma V; A clinical study to evaluate the role of Madhumehari Vati in the management of Madhumeha type 2 diabetes. *Int J Adv Med.* 2021; 8(4); 574-579. doi:<http://dx.doi.org/10.18203/2349-3933.ijam20211058>
 19. Hari Sadasiva Sastri Paradakara editor. *Astaghridaya of Vagbhata.* Varanasi: Chaukhamba sanskrit sansthan. 2015. 732p.
 20. Rejitha S, Prathibha P, Madambath I. The Ayurvedic drug Ksheerabala (101) ameliorates alcohol-induced neurotoxicity by down-regulating the expression of transcription factor (NFkB) in rat brain. *Ayu.* 2015; 36(3); 323-328. doi:10.4103/0974-8520.182749
 21. Sivasankar Reddy Konda, Mudiganti Ram Krishna Rao, Minu Priya, Prabhu K, Kalaivani V. S, Kumaran D. et al.; The Antioxidant Study of an Ayurvedic Medicine, Balarishtam. *Int. J. Pharm. Sci. Rev. Res.* 2017; 42(1); 29-32.
 22. Anuradha Roy, Monisha VM; Mahanarayana Taila Matra Basti in Artavakshaya (oligo-hypomenorrhoea): an Open interventional Pilot Study on Ayurvedic principle. *J of Ayurveda and Hol Med (JAHM).* 2021; 9(4); 1-11
 23. Karunagoda K, Shukla Upadhyaya K, Donga S, Tanna C, Dei LP; A comparative study of Dashamoola Taila Matra Basti and Tila Taila Matra Basti in Kashtartava (dysmenorrhoea). *Ayu.* 2010; 31(3); 305-310. doi:10.4103/0974-8520.77154
 24. Hari Sadasiva Sastri Paradakara editor. *Astaghridaya of Vagbhata.* Varanasi: Chaukhamba sanskrit sansthan; 2015. 754p.
