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A SINGLE CASE STUDY ON THE MANAGEMENT OF DIABETIC POLYNEUROPATHY WITH MOKSHAYAN

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ABSTRACT
Diabetic Polyneuropathy is one among the life style disorders. An integrated approach should be done for analysis of a disease specially when no direct references are found for Diabetic Polyneuropathy. The living body perceives stimulus, responds to it through the medium of *Vata*. *Vata* is the sole factor for health in its equilibrium (*Prakrita*), at its own abode (*Sthanastha*) and unimpeded mobility (*Avyahata gati*).[1] The later being the most important since *gati* is the peculiar feature mostly related with neurological function. Coming to the sensory functions, *Sparsha* or tactile perception is the quality of *vayu mahabhuta*, by means of which the individual can sense the condition of environment in which he is living. The *twakindriya* itself is composed of *akasha* and *vayu mahabhuta* composition and *ashrayee* for *Vata*. So the need for management of diabetic polyneuropathy led to the trial of Mokshayan.

INTRODUCTION

The concept of the *Samprapti* of a disease is a result of a diligent observation of its signs and symptoms and their in-depth analysis. Charting a course of treatment for such diseases would bear fruit only if the signs and symptoms of diseases are observed in terms of Ayurveda symptomatology followed by the construction of a supporting base of knowledge regarding its etiology and pathology, all of which without deviating from the acknowledged principles of Ayurveda.

Vata is *asamghata* (incorporeal) and *anavasthita* (unstable) and hence *anasadhya* (inaccessible).[2] Due to this the physical aspects Vata, it is difficult to perceive but its functions can be inferred, from these functions, the properties (*gunas*) are known. Eventhough *Vata* is *avyakta*, its *karmas* are *vyakta*.[3] Vata is *sookshma*, *svayambhoo*, and *sarvagata*.[4] These qualities of *Vata* can be compared with that of a nerve impulse. A nerve impulse is self originated, propagated, reaches all the way through, it is subtle and it is assessed by the functions like movement, secretions etc. *Vata* is responsible for all *chestas*, *indriyapravruttis*-especially the sense of touch. *Vata* is its normal state governs the enthusiasm, respiration, motor activities, reflex activities, regulation of circulation and all functions of sense organs.[5]

From the above description it is clear that the living body perceives stimulus, responds to it through the medium of *Vata*. *Vata* is the sole factor for health in its equilibrium (*Prakrita*), at its own abode (*Sthanastha*) and unimpeded mobility (*Avyahata gati*).[6] The later being the most important since *gati* is the peculiar feature mostly related with neurological function. Coming to the sensory functions, *Sparsha* or tactile perception is the quality of *vayu mahabhuta*, by means of which the individual can sense the condition of environment in which he is living. The *twakindriya* itself is composed of *akasha* and *vayu mahabhuta* composition and *ashrayee* for *Vata*. The body and mind is the *adhishtana* of *vedana* and this *vedana* is perceived by whole body except *kesha* ,*loma*, *nakha*, *anna*, *mala*, *mootra* and *shabdadi gunas*.[7] *Ganghadhara*, while commenting on *vedanasthapana gana* mentions that *vedana* is *samjna* (sensation) - nothing but sensation of touch. *Chakrapani*, while commenting on "*Abhivodha*" clarifies that *Vata* is the receptor for all *indriyarthas*. The *Sparshanendriya* is *Vayumaya* and all pervasive in the body.[8] The properties of other *mahabhutas* like *khara*, *drava*, *chala* and *ushna* are to be known by touch.[9] This can be interpreted as sensory modalities like hot / cold sensations, position sense, vibration sense etc. The five *karmendriyas* which performs motor activities are also under control of *Vata*. Hence, it can be summarized that *Vata* is the prime factor causing health and disease. Vata is responsible for the normal functioning of all *Indriyas*.

It can be seen that all these functions are impaired in a neuropathy patient. According to *Charaka* it is the *Ojas*, which is situated in the *hridaya* is responsible for the *Sparsha jnana*.[10] Chakrapani further clarifies it as perception of all sensation from external environment through *Sharira-Indriya-Satwa-Atma samyoga*

(physiology of perception of touch).[11] This supports *Sushruta's* view of *sparsha ajnana* as a function of *rakta* which is situated at *hridaya*. Hence, sensory perception is function of *Vata* along with *Rasa* and *Rakta*, all being *sarvadehaga*.

CASE REPORT

A 42 year old male diagnosed of type 2 diabetes came with complaints of Pain, numbness, tingling sensation on his both legs and generalised weakness. Patient was on metformin 500mg twice a day before meal with water. There were no associated complaints like itching.

There was no any past history of injury, wound, in contact to any chemical or harmful dietry substance.

EXAMINATION

Vitals were normal with adequate diet. Local & systemic examination reveals no any abnormality. Bowel habits were normal. Micturation was 5-6 times in a day & 2 times at night. No any colour changes or other deformity was found in both legs.

EVALUATION OF SYMPTOMS

Evaluation of neuropathy are based on the following criteria-
ACTG PERIPHERAL NEUROPATHY SCREENING TOOL[12]
Mild to severe

01	02	03	04	05	06	07	08	09	10

1. Symptoms BT AT

a. Pain, aching, or burning in feet, legs ……
b. "Pins and needles" in feet, legs ……
c. Numbness (lack of feeling) in feet, legs ……

2. Location of symptoms

Use Score of:
0 = None
1 = feet only
2 = extends to ankles
3 = extends above ankle but not to knee 4 = extends to knees
5 = extends above knees

BT AT

a. Pain, aching, or burning in feet, legs ……
b. "Pins and needles" in feet, legs ……
c. Numbness (lack of feeling) in feet, legs ……

3. Vibration Perception BT AT

a. Great toe DIP joint perception of vibration in seconds
b. Vibration perception score

Vibration Perception

0 = felt > 10 seconds
1 = felt 6-10 seconds
2 = felt < 5 seconds 3 = not felt

4. Ankle reflexes

0 = absent
1 = Hypoactive
2 = Normal deep tendon reflexes 3 = Hyperactive
4= Clonus
8 = unable/did not assess

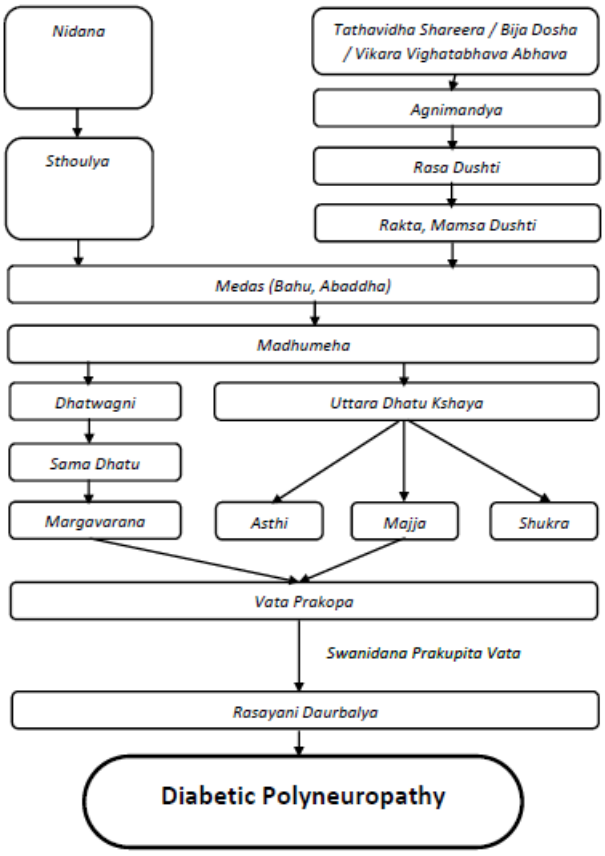
Ankle reflex BT AT

Samprapti Ghataka

Dosha:	*Tridoshas; Vata pradhana*
Dushya:	*Rasa, Rakta, Mamsa, Medas, Asthi, Majja, Shukra and Ojas, Upadhatu: Twacha: sira, kandara and snayu in* later stages.
Agni:	*Jatharagni and dhatwagni mandya*
Ama:	*Tajjanya*
Srotas:	*Annavaha, Udakavaha, Rasavaha, Raktavaha, Mamsavaha, Medovaha, Majjavaha, Shukravaha, Swedavaha, Mootravaha, Purishavaha and Samjnavaha Srotas.*
Srotodushti Prakara:	*Sanga, Vimarga gamana*
Udbhavasthana:	*Amapakwashaya*
Sancharasthana:	*Rasayani*
Vyaktasthana:	*Shakha especially adhashakha*
Adhishthana:	*Shareera*
Rogamarga:	*Bahya*
Vyadhi Swarupa:	*Chirakari*

Samprapti

SCHEMATIC REPRESENTATION OF *SAMPRAPTI*



Medication: 10 ml mokshayan on every 3rd day for 30 days

Mokshayan- Contents

Ayurvedic name	Botanical name
Haridra	Curcuma Longa
Punarnava	Boerhaavia Diffusa
Bilva	Aegle Marmelos
Lodhra	Symplocos Racemosa
Vacha	Acorus Calamus
Tulsi	Ocimum Sanctum L
Brahmi	Bacopa Monnieri

Manjishtha	Rubia Cordifolia
Amla	Emblica Officinalis
Ashwagandha	Withania somnifera
Guduchi	Tinospora Cordifolia
Ghritkumari	Aloe vera
Raw honey	

Haridra[13]
Gastrointestinal disorders, Respiratory disorders, Inflammatory disorders, Diabetes mellitus, Cardiovascular disorder, Hepatoprotective, Neuroprotective activity, Alzheimer's disease, Chemoprotective activity, Anti cancer activity, Anti allergic activity, Anti-dermatophytic activity.

Punarnava[14]
Immunomodulatory effects, Immunosuppressive activity, Antidiabetic activity, Anti- metastatic activity, Antioxidant activity, Antiproliferative and Antiestrogenic activity, Analgesic and Anti-inflammatory activity, Antilymphoproliferative Activity, Anti-viral activity, Hepatoprotective Activity, Antibacterial Activity, Antistress & adoptogenic Activity, Nitric Oxide Scavenging Activity, Adaptogen Activity, Growth Inhibition of Struvite Crystals, Anti fibrinolytic activity, Chemopreventive action

Bilva[15]
Antioxidant activity, Antifungal and Antibacterial activity, Anti-inflammatory activity, Antidiabetic activity, Hepato-protective activity, Anti-arthritic activity, Antidiarrheal activity.

Amalaki
Cytoprotective, immunomodulatory, prevent hepato and renal toxicity of heavy metals like lead and aluminium, hypolipidaemic[16,17], antioxidant[18], mild CNS depressant, anti- atherosclerotic[19], antiatherogenic[20], anti-inflammatory, antidiabetic[21], antihypercholesterolaemic[22], improves liver function[23], adaptogenic[24], analgesic[25], possesses scavenging activity.[26]

Ashwagandha
Adaptogenic[27], attenuates nociceptive pain[28], antidepressant[29], antistress[30], immunomodulatory[31,32], free radical scavenger activity (antioxidant activity)[33], reduces lipid peroxidation[34], increases superoxide dismutase and catalase[35], nootropic[36], anxiolytic[37], anti inflammatory[38], hypoglycemic, diuretic[39], hypocholestrolaemic[40], anti-apoptotic[41], cardioprotective[42], suppresses vascular endothelium growth factor (VEGF) induced neovascularization[43], prevent osteoporosis[44], prevents oxidative stress[45], helps in regeneration of neural tissues[46,47], improves memory impairment, neurite atrophy and synaptic loss in the cerebral cortex and hippocampus[48], prevented loss of axons, dendrites, and synapses and causes regeneration[49], antidiabetic[50], hemopoietic and rejuvenating,[51] improves insulin sensitivity[52] improves reduced locomotor activity and anxiety levels[53] reduces elevated serum cholesterol, triglycerides, lipoprotein levels[54] anticoagulant, platelet antiaggregatory, lipoprotein lipase releasing[55] cytoprotective[56], increases Interferon gamma, IL-2 & Granulocyte macrophage colony stimulating factor, decreases TNF-α[57], interleukin-1beta, cyclooxygenase & lipooxygenase[58], & other cell signaling intermediates, prevents glycation induced pathogenesis, prevents aging.[60]

Lodhra[60]
Management of Diabetic Complication, Antibacterial Activity, Anthelmintic effect, Anti- inflammatory activity, Anti-oxidant activity, Anti ulcer property, Hypolipidemic activity, Neuro supportive role, Hepato protective activity, Lipoxygenase and urease inhibitory activity.

Tulsi[61]
Anticancer activity, Chemopreventive activity, Radioprotective activity, Antioxidant activity, Antihypertensive and cardioprotective activities, Antimicrobial activity, Central Nervous System (CNS) depressant activity, Antiinflammatory activity, Analgesic activity, Antipyretic activity, Memory enhancer activity, Hepatoprotective activity, Antifertility activity, Antidiabetic activity, Antiulcer activity, Antiarthritic activity, Adaptogenic activity/antistress activity, Anticataract activity, Anticoagulant activity,

Bramhi[62]
Anti Asthmatic Activity, Anti cancer activity, Anticonvulsive, Antidepressant, Anti inflammatory, Anti nociceptive activity, Antioxidant activity, Anti stress Activity, Anti Spasmodic Activity, Anxiolytic effect, Cardiovascular activity, Gastroprotective activity, Hepatoprotective activity, Learning and memory

Manjistha[63]
Anti-Inflammatory Effect:, Neuroprotective Properties, Antibacterial Activity, Hepatoprotective Activity, Anti Diabetic Property, Radioprotective Property, Nephrotoxicity, Anti-proliferating Property, Protective effect, Antioxidant effect, Anti Ulcer Effect, Anti-Adipogenic Activity, Anti-HIV Activity, Wound Healing Effect, Anti-tumour activity

Guduchi[64]
Anti-stress activity, enhance verbal learning and logical memory, protects against neuro- degeneration, anti-inflammatory, mild analgesic effect, anti-allergic and bronchodilator, Antioxidant activity, effective in iron-mediated lipid damage and gamma-ray-induced protein

damage, Antineoplastic and Radio-protective activity, Antipyretic, Anti-infective activity, hepato-protective activity, anti-hyperglycemic activity, immuno-modulatory action, diuretic effects, cardio-protective, anti-leprotic activity in a combination formulation, Gastrointestinal and anti-ulcer activity, Antifertility Activity, anti-osteoporotic agent, increase the blood profile and has lead scavenging activity,

Vacha[65]

Nootropic Activity, Anti-diabetic Activity, Anti-seizures Activity, Antidepressant Activity, Neuromodulatory Effect, Anticancer Activity, Antioxidant Activity, Antihypertensive Effect, Anti HIV Activity, Cytotoxic Effect, Immunosuppressive Activity, Radioprotection and DNA Repair Activity, Coronary Vasodilator Effect, Antispasmodic and Anti-diarrhoeal Effect, Insulin Sensitizing Activity, Wound-healing Activity, Anti-inflammatory Activity, Synergistic Anthelmintic Activity, Antihepatotoxic Activities, Anti-ischemic Heart Disease Activity, Antifungal Activity, Antibacterial Activity, Analgesic Effect, Antipyretic Activity, Bronchodilatory Activity, Licicidal Activity, Mosquito Larvicidal Activity, Repellent and Oviposition Deterrent Activity.

Ghritkumari[66]

Anti inflammatory action, Anti-diabetic effects, Anti mutagenic effects, Anti-oxidant effects, Immunomodulatory effects, Anti bacterial/ anti fungal/ anti viral actions, Effect on gastric acid secretion and ulcers, Arthritis, Joint and Muscle Pain, Laxative effects, Antiseptic effect

Honey[67]

Antimicrobial Activity of Honey, Antibacterial Activity, Anti viral activity, Diabetic Benefits, Gastrointestinal Effects, Arthritis, Bladder Infections, Anti-cholesterol, skin infections, immune booster

OBSERVATION

There were significant reduction of symptoms found in ACTG peripheral neuropathy screening tool with reduction in fasting & post prandial glucose levels and also where patient was having 5-6 times in day & 2 times in night frequency of micturition was reduced to 4 times in a day to 1 time in night.

Parameters	B.T.	A.T.
Bsl- Fasting	160	100
Bsl- P.P.	220	135
Pain, aching, or burning in feet, legs	7	4
Pins and needles" in feet, legs	8	3
Numbness (lack of feeling) in feet, legs	8	3
Great toe DIP joint perception of vibration in seconds	8 seconds	11 seconds
Vibration perception score	1	0
Ankle reflexes	2	2

DISCUSSION

There were significant markable changes were found in patient of diabetic polyneuropathy due to the group of drug selected were having anti diabetic activity, Analgesic and Anti- inflammatory activity, Antistress & adoptogenic Activity, Neuroprotective Properties, Insulin Sensitizing Activity, immune booster activity. All the drugs are proven anti-oxidant reducing the oxidative stress over the peripheral nerves thus it may provide relief in numbness & paraesthesia.

All the ingredients of Mokshayan are anabhishyandi, Snigdha, Srotoshodhana and all are Rasayana fulfilling the ideal qualities to break the Avarana Samprapti of Diabetic Polyneuropathy. It acts both on pradhana vyadhi and Upadrava also. The major ingredients have Snigdha and Ruksha guna correcting Vata without disturbing Kapha and Pitita. The rukshtwa helps in draining excess kleda and acts as antagonist to bhahudrava shleshma and medas.the ingredients possess sheeta and Ushna Veerya in equal ratio correcting both the major doshas in Avarana i.e. Kapha and Vata. Ingredients possess Madhura Vipaka correcting the Dhatushaithilya and exerting Rasayana effect. Mokshayan acts as srotoshodhana correcting metabolism and providing relief in the symptoms.

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