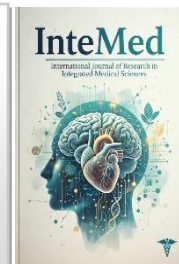




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Research Article

Efficacy of *Punarnava Churna* in Diabetic Neuropathy: A Randomized Controlled Clinical Study

Dr. Anupam Dandgavhal^{1*}, Dr. Sandeep Jagtap², Dr. Rucha Magadum³, Dr. Satish Shindadkar⁴

1. Assistant Professor, Department of Kayachikitsa, P. G. Medical College, Nandurbar.
Email Id: Atharva.appointment@gmail.com
2. Assistant Professor, Department of Kriyasharir, P.G. Medical College, Nandurbar.
Email Id: jagtapclinic@gmail.com
3. Chief Consultant, Vedsatva Ayurved Chikitsalaya, Pune.
Email Id: ruchamagadum31@gmail.com
4. HOD & Professor, Department of Agadtantra, Chaitanya Ayurved Mahavidyalaya, Sakegaon, Dist-Jalgaon.
Email Id: satishshindadkar@gmail.com

ABSTRACT

Diabetic neuropathy is one of the most common microvascular complications of diabetes mellitus, significantly affecting quality of life through pain, paresthesia, numbness, and sensory deficits. Conventional management primarily focuses on glycemic control and symptomatic relief; however, long-term outcomes remain suboptimal and are often associated with adverse drug effects. Ayurveda correlates diabetic neuropathy with *Madhumehajanya Vatavyadhi*, wherein aggravated *Vata Dosha* along with

Dhatukshaya contributes to neurovascular dysfunction. *Punarnava* (*Boerhavia diffusa*), a well-known Ayurvedic drug possessing anti-inflammatory, antioxidant, neuroprotective, and *Shothahara* properties, may offer therapeutic benefits in diabetic neuropathy. The present randomized controlled clinical study evaluated the efficacy of *Punarnava Churna* in patients with diabetic neuropathy. Sixty diagnosed patients were randomly divided into two groups. Group A received *Punarnava Churna* along with standard diabetic care, while Group B received only conventional management.

Clinical assessment was performed using Neuropathy Symptom Score (NSS), Visual Analog Scale (VAS), vibration perception threshold, and glycemic parameters before and after intervention. Patients receiving *Punarnava Churna* demonstrated significant improvement in burning sensation, tingling, numbness, pain scores, and sensory perception compared to the control group. The drug was well tolerated without significant adverse effects. The findings suggest that *Punarnava Churna* may serve as an effective adjuvant therapy in diabetic neuropathy through its *Vatahara*, anti-inflammatory, and neuroprotective actions. Further multicentric trials with larger sample sizes are necessary to validate these observations.

Keywords: *Punarnava Churna*, diabetic neuropathy, *Madhumeha*, Ayurveda, peripheral neuropathy, *Vatavyadhi*

1. Introduction

Diabetes mellitus is a chronic metabolic disorder associated with multiple complications involving the vascular and nervous systems. Diabetic peripheral neuropathy (DPN) is among the most prevalent complications, affecting nearly 50% of diabetic patients during the course of disease [1]. It manifests clinically as pain, burning sensation, numbness, tingling, sensory loss, and motor dysfunction.

Current management strategies involve:

- Glycemic control
- Antidepressants
- Anticonvulsants
- Antioxidants

Despite advances in pharmacotherapy, complete symptomatic relief is uncommon and long-term use

of conventional drugs may cause adverse effects [2].

Ayurveda correlates diabetic neuropathy with *Madhumehajanya Vatavyadhi*, where chronic *Madhumeha* leads to *Dhatu Kshaya* and aggravation of *Vata Dosha* affecting peripheral nerves [3].

Punarnava (Boerhavia diffusa) is extensively described in Ayurvedic classics for its:

- *Shothahara* (anti-inflammatory) action
- *Rasayana* effect
- *Mutrala* activity
- *Vata-Kapha Shamaka* properties [4]

Experimental studies demonstrate antioxidant, neuroprotective, anti-inflammatory, and microcirculatory benefits of *Punarnava*, suggesting its potential role in diabetic neuropathy [5].

Aim and Objectives

Aim

To evaluate the efficacy of *Punarnava Churna* in diabetic neuropathy.

Objectives

- To assess reduction in neuropathic symptoms
- To evaluate sensory improvement
- To assess safety and tolerability
- To compare outcomes with conventional management

2. Materials and Methods

2.1 Study Design

Randomized controlled open-label clinical study.

2.2 Study Setting

Conducted at the Department of *Kayachikitsa* in a tertiary Ayurvedic teaching hospital.

2.3 Sample Size

Total 60 patients.

- Group A (Trial Group): 30 patients
- Group B (Control Group): 30 patients

2.4 Randomization

Simple random sampling method using computer-generated random allocation.

2.5 Inclusion Criteria

- Diagnosed Type 2 Diabetes Mellitus
- Age 35–70 years
- Clinical features of diabetic neuropathy
- HbA1c between 6.5–10%

2.6 Exclusion Criteria

- Severe diabetic complications
- Peripheral vascular disease
- Chronic renal failure
- Alcoholic neuropathy
- Pregnant women

3. Intervention

Group A (Trial Group)

Punarnava Churna

Drug

Fine powder of *Boerhavia diffusa* root.

Dose

- 5 g twice daily

Anupana

- Lukewarm water

Timing

- After meals

Duration

- 90 days

Concomitant Therapy

Standard oral hypoglycemic agents continued.

Group B (Control Group)

- Standard diabetic management only.

4. Assessment Criteria

Subjective Parameters

Neuropathy Symptom Score (NSS)

Assessment of:

- Burning sensation
- Tingling
- Numbness
- Pain

Visual Analog Scale (VAS)

Pain severity scored from 0–10.

Objective Parameters

Vibration Perception Threshold (VPT)

Measured using biothesiometer.

Laboratory Parameter

- Fasting Blood Sugar (FBS)
- Postprandial Blood Sugar (PPBS)
- HbA1c

5. Observations and Results

Clinical Improvement

Parameter	Group A	Group B
Burning sensation	Markedly reduced	Mild reduction
Tingling	Significant improvement	Moderate
Numbness	Improved	Mild
Pain score	Significant reduction	Moderate

Statistical Analysis

- Paired t-test used for intragroup comparison
- Unpaired t-test used for intergroup comparison
- $p < 0.05$ considered statistically significant

Overall Outcome

Group A demonstrated statistically significant improvement in:

- NSS scores
- VAS scores
- Sensory perception

No serious adverse effects were reported.

6. Discussion

Diabetic neuropathy involves oxidative stress, microvascular ischemia, chronic inflammation, and neuronal degeneration [6]. Ayurveda attributes these manifestations to aggravated *Vata Dosha* associated with *Dhatukshaya* in chronic *Madhumeha*.

Punarnava possesses:

- Anti-inflammatory activity
- Antioxidant effects
- Neuroprotective action
- Microcirculatory improvement

The reduction in burning sensation and pain may be attributed to:

- *Vatahara* effect
- Reduction of inflammatory mediators
- Improved tissue perfusion

Experimental studies demonstrate that *Punarnava* reduces oxidative stress markers and improves neuronal function [7].

The observed sensory improvement may result from enhanced peripheral circulation and reduction in neuronal edema.

7. Probable Mode of Action

Ayurvedic Perspective

Dosha Karma

- *Vata-Kapha Shamaka*

Dhatu Effect

- Supports *Majja Dhatu*

Srotas Action

- Improves *Rasavaha* and *Majjavaha Srotas*

Modern Pharmacological Perspective

Major Actions

- Antioxidant
- Anti-inflammatory
- Neuroprotective
- Anti-edematous

Active Constituents

- Punarnavine
- Boeravinones
- Flavonoids

8. Adverse Effects and Safety

No major adverse reactions were observed during the study.

Possible mild effects:

- Gastric discomfort (rare)
- Loose stools in sensitive individuals

Liver and renal function remained within normal limits.

9. Research Gaps and Limitations

- Small sample size
- Short follow-up duration
- Open-label design
- Lack of nerve conduction studies

10. Future Perspectives

- Multicentric double-blind trials
- Combination studies with *Rasayana* drugs
- Nerve conduction-based evaluation
- Molecular studies on neuroprotection

11. Conclusion

Punarnava Churna demonstrated significant efficacy in reducing neuropathic symptoms and improving sensory function in diabetic neuropathy when used as an adjunct to conventional diabetic care. Its anti-inflammatory, antioxidant, and *Vatahara* properties may contribute to neuroprotection and symptomatic relief. The formulation was safe and well tolerated. Larger randomized controlled studies with advanced neurological assessment tools are required to establish definitive clinical efficacy.

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