



ASSESSMENT OF RISK FACTORS, MANAGEMENT PATTERN AND CLINICAL MANIFESTATIONS IN PERIPHERAL NEUROPATHIC PATIENTS - AN OBSERVATIONAL STUDY

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ABSTRACT

Objectives: To analyze the risk factors, management patterns, and common clinical manifestations of peripheral neuropathic pain. **Methodology:** A prospective observational study was conducted over six months in a Tertiary care Hospital, Bangalore. Sixty patients above 18 years, diagnosed with peripheral neuropathic pain, were included after obtaining informed consent. Patients with other neurological disorders or unwilling to participate were excluded. Data on demographics, medical history, lifestyle, and medications were collected from case sheets and patient interactions. Symptoms were evaluated with the S-LANSS Neuropathic Pain Scale, and pain severity was measured using the Wong-Baker scale. **Results:** Of the 60 patients, 52% were male and 48% female, with the majority aged 51–60 years (35%). Major risk factors identified were diabetes mellitus, hypertension, and ischemic heart disease. Common symptoms included tingling, burning, sensitive to touch, and numbness. Pregabalin (21.66%) and gabapentin (8.33%) were the most prescribed drugs, supplemented by non-pharmacological approaches such as massage and exercise. **Conclusion:** Peripheral Neuropathy (PN) is prevalent among older adults and is strongly linked to metabolic and cardiovascular comorbidities. Effective management requires both pharmacological and supportive measures to address symptom burden and functional limitations.

KEYWORDS : PN - Peripheral neuropathy, LANSS – Leeds Assessment of Neuropathic Symptoms and Signs, IHD- Ischemic Heart Disease, HbA1C- Glycated Haemoglobin

INTRODUCTION

Peripheral neuropathy (PN) is a significant public health issue and its prevalence varies widely across different regions. In India, community-based studies show rates ranging from 5 to as high as 2400 per 10,000 people. Among individuals with diabetes, 10.5% to 32.2% experience diabetic neuropathy. Beyond the typical sensory and motor problems, PN can seriously affect a person's mobility, daily activities, and work performance. Neuropathic pain often leads to sleep disturbances, low mood, and an overall decline in quality of life (QoL).

PN occurs when peripheral nerves are damaged—this may involve the axon, the myelin sheath, or both. A wide range of factors can cause this damage, including metabolic disorders like diabetes, autoimmune or inflammatory conditions, nutritional deficiencies, toxins, infections, hereditary disorders, trauma, or reduced blood supply to nerves. The likelihood of developing PN also increases with age, female sex, existing health conditions, and certain lifestyle factors.

Management aims to relieve symptoms and address the root cause. Non-pharmacological approaches—such as topical treatments, physiotherapy, and complementary therapies—can help reduce pain and enhance QoL. First-line medications include tricyclic antidepressants, SNRIs, pregabalin, and gabapentin, while opioids are generally reserved for severe, treatment-resistant cases. Despite available options, many challenges remain, including under-recognition of neuropathic pain, variations in treatment approaches, and limited use of validated assessment tools like the LANSS scale.

This study aims to evaluate the risk factors, clinical manifestations, and prevailing management practices in patients with peripheral neuropathic pain, with the objective of supporting more effective and patient-centered treatment strategies.

METHODS AND STUDY DESIGN

Study was approved by the Institutional Ethics Committee of St. Philomena's Hospital (Approval date: March 4, 2024; Ref No. Al-Am/2024/287)

This is a hospital-based prospective observational study, was conducted over six months in a tertiary care Hospital of Bangalore. Adults aged above 18 years with a confirmed diagnosis of peripheral neuropathic pain were included, while patients unwilling to participate or those with other neurological disorders or conditions mimicking peripheral neuropathy were excluded. The research team attended daily ward rounds to identify and recruit eligible patients after obtaining informed consent. Demographic details, medication history, family history, diet, and lifestyle information were recorded. Pain severity was assessed using the S-LANSS Neuropathic Pain Scale and Wong-Baker scale. Data were collected from patient case sheets, direct interviews with patients or their attenders, and discussions with treating doctors.

RESULTS

Demographics

A total of 60 patients who met the inclusion criteria, comprising 31 males (52%) and 29 females (48%). Most patients were in the age group of 51–60 years (35%), followed by 71–80 years

(26.66%).

Comorbidities

Diabetes mellitus was present in 51 patients (85%), among which 11 patients (18.33%) also had hypertension, 3 patients (5%) had chronic kidney disease (CKD) with hypertension, 2 patients (3.33%) had urinary tract infection (UTI) with hypertension, and 2 patients (3.33%) had ischemic heart disease (IHD) with hypertension, while the remaining diabetic patients had other comorbidities. The duration of diabetes showed that 16 patients (26.66%) had diabetes for 0–5 years, 10 patients (16.66%) had diabetes for 6–10 years, 12 patients (20%) had diabetes for 11–15 years, and 8 patients (13.35%) had diabetes for more than 20 years. Among diabetic patients, uncontrolled diabetes (HbA1c ≥6.5) was observed in 30 patients (50%), whereas 2 patients (3.33%) had well-controlled HbA1c (<5.6), 2 patients (3.33%) were in the prediabetic range (5.7–6.4). HbA1c data were unavailable for 23 patients (43.33%). Hypertension was identified in 36 patients (60%), with the highest proportion 10 patients (16.66%) having hypertension for 0–5 years, followed by 8 patients (13.33%) each in the 6–10 years and 11–15 years groups, and 5 patients (8.33%) each in the 16–20 years and more than 20 years group. Ischemic heart disease (IHD) affected 8 patients (13.33%), of these 5 patients (8.33%) had it for 0–5 years, 2 patients (3.33%) had it for 6–10 years, and 1 patient (1.66%) had it for 16–20 years. No cases were observed between 11–15 years or beyond 20 years.

The duration of peripheral neuropathy varied, with 24 patients newly diagnosed, 26 having the condition for 1–5 years, 5 for 6–10 years, 3 for 11–15 years, and 2 for 16–20 years.

Clinical manifestations:

Most patients were on multiple medications, including metformin and glimepiride for diabetes management, amlodipine for hypertension, aspirin and atorvastatin for cardiovascular protection, and additional agents for neuropathic pain. Pain severity, assessed using the Wong-Baker scale (range 2–10), showed that most patients experienced moderate to high pain. The majority (53.33%) reported a score of 8, followed by 38.34% with a score of 6. Moderate pain (score 4) was seen in 5% of patients, while 3.33% reported severe pain (score 10). No patients reported minimal pain (score 2). Pain characteristics, assessed using the LANSS (Leeds Assessment of Neuropathic Symptoms and Signs) scale, included tingling, prickling, burning, numbness, tenderness, and electric shock-like sensations. The most common presentation, seen in 10 patients (16.69%), was tingling and prickling with burning pain, sensitivity to touch, and numbness/tenderness. This was followed by a combination of tingling and prickling, burning pain, electric shock-like pain, discoloration, and numbness/tenderness in 8 patients (13.33%). Seven patients (11.66%) reported tingling and prickling with burning pain and touch sensitivity, while 4 patients (6.66%) experienced burning pain with touch sensitivity and discoloration.

Management:

Non-pharmacological management:

Among the 60 patients, the use of non-pharmacological measures varied. Massage therapy, regular exercise or walking, and warm water packs were each used by 5 patients (8.33%). Cold therapy was used by 3 patients (5%), while OTC topical agents and coconut oil were each used by 2 patients each (3.33%).

Pharmacological management:

For pharmacological management of neuropathic symptoms, pregabalin was the most commonly prescribed medication, used in 13 patients (21.66%). Gabapentin and mecobalamin were each prescribed to 5 patients (8.33%). Combination therapies were also utilized, including nortriptyline with

pregabalin in 4 patients (6.6%) and mecobalamin with pregabalin in 3 patients (5%).

Table 1 – Comorbidities along with PN

Co-morbidity Category	No. of Patients	Percentage (%)
Diabetes Mellitus (any type)	51	85.0%
Hypertension	36	60.0%
Diabetes + Hypertension (without IHD)	28	46.66%
Ischemic Heart Disease (IHD)	9	15.0%
Diabetes + Hypertension + IHD	6	10.0%
Hypertension + IHD (without Diabetes)	0	0%
Other Comorbidities	24	40.0%

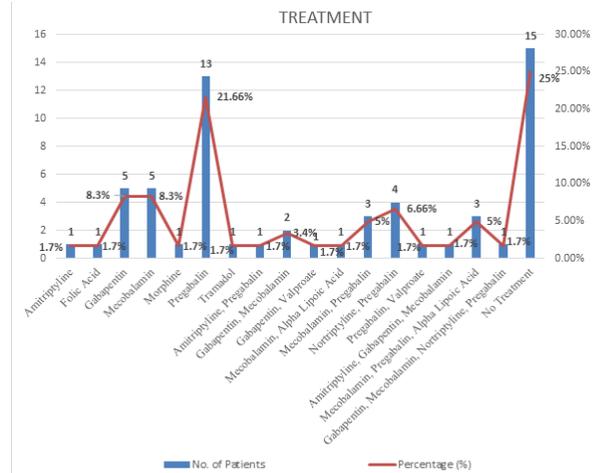


Figure 1 - Treatment in Peripheral Neuropathy

DISCUSSION

A total of 60 patients who met the inclusion criteria, consists of 31 males (52%) and 29 females (48%). The majority were aged between 51–60 years (35%), followed by those aged between 71–80 years (26.66%). This age and gender distribution is consistent with findings reported in previous Indian studies. D'Souza et al. (2015) also found that being over 40 years and male significantly increases the risk of diabetic peripheral neuropathy, with men showing nearly 2.7 times higher odds of developing this condition. Research suggests that sex hormones may partly explain this difference- estrogen appears to protect nerve health, while lowers testosterone levels in males which may worsen nerve damage. Age further amplifies these risks and hence, older adults with neuropathy often experience slower gait, balance problems, frequent falls, and greater pain, all of which can affect independence and overall quality of life. These parallels strengthen the validity of our study's demographic profile and underscore that middle-aged, elderly, and male diabetics are a particularly vulnerable subgroup requiring focused screening and preventive interventions.

In our study, diabetes mellitus was the most common comorbidity (85%) among patients with neuropathic symptoms, followed by hypertension (60%) and ischemic heart disease (15%). Nearly half of the patients had both diabetes and hypertension, and 10% had all three conditions, reflecting how metabolic and cardiovascular risks often cluster in individuals with neuropathy. These findings align with the meta-analysis by Liu et al. (2019), which highlighted longer diabetes duration, poor glycemic control, and increasing age as key contributors to diabetic neuropathy. The high prevalence of diabetes in our study emphasizes the central role of chronic hyperglycemia in nerve damage. The frequent coexistence of hypertension and IHD further indicates that vascular problems may worsen neuropathic

complications through combined micro- and macrovascular injury. Unlike Liu et al., who reported no strong association between lipid levels or BMI and neuropathy, our patients showed a considerable burden of additional comorbidities, such as dyslipidemia, chronic kidney disease, and nutritional deficiencies—patterns commonly seen in the Indian population. Overall, our findings support global evidence on diabetes as the main driver of neuropathy while highlighting region-specific comorbidity trends that are important for targeted screening and management.

The treatment patterns in our study matched international recommendations in some areas but differed in others. The frequent use of pregabalin and gabapentin fits well with global guidelines, which list them as first-line options for neuropathic pain. Similarly, combining pregabalin with nortriptyline aligns with recommended second-line therapy. However, the low use of tricyclic antidepressants and the absence of SNRIs, tramadol or tapentadol, and interventional procedures show clear gaps when compared to the full international algorithm. At the same time, our findings reflect real-world clinical practice in India, where conditions like vitamin B12 deficiency are common. This explains why mecobalamin and other nutritional supplements were used more often, highlighting how treatment approaches are adapted to meet the specific needs of the local population.

Among the 60 patients, the use of non-pharmacological measures varied. Massage therapy, regular exercise or walking, and warm water packs were each reported by 5 patients (8.33%), while 3 patients (5%) used cold therapy and 2 patients (3.33%) each used OTC topical agents or coconut oil. Although most of these practices were initiated by patients rather than formally prescribed, they show an awareness of strategies that can help relieve symptoms beyond medications. These observations align with the review by Liampas et al. (2020), which highlighted the benefits of lifestyle changes, regular physical activity, and complementary therapies—such as massage and thermal treatments—in diabetic peripheral neuropathy. Exercise can support nerve health and improve overall quality of life, while massage and topical approaches offer focused symptom relief. Overall, our findings suggest that while non-pharmacological engagement is still limited, these efforts are meaningful and underscore the need for structured patient education and routine inclusion of evidence-based lifestyle interventions in neuropathy care.

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