

# Assessment of pain and impact of care among patients with painful diabetic peripheral neuropathy

Christie Schumacher and Scott E. Glosner

## Abstract

**Objectives:** To assess the prevalence of painful diabetic peripheral neuropathy (DPN), evaluate the impact of DPN on patients' function and quality of life, and assess patient satisfaction with their current DPN treatment.

**Design:** Cross-sectional study.

**Setting:** Patient-centered medical home model at an internal medicine clinic in Chicago, from November 1, 2011, through November 1, 2012.

**Participants:** 71 patients with type 1 or type 2 diabetes aged 45 to 85 years and receiving diabetes education and medication management from the clinic pharmacist.

**Intervention:** Paper survey administered to patients during clinic visits.

**Main outcome measures:** DPN history; DPN impact on activity level, sleep, and quality of life; and satisfaction with current DPN treatment.

**Results:** Of the 71 participants, 22% (n = 15) reported a diagnosis of DPN from their providers; however, 54% (n = 37) reported burning, aching, or tenderness in their hands, arms, legs, or feet. More than 50% of patients with these symptoms had experienced them for more than 1 year. Fewer than one in five patients (14% [n = 5]) reporting symptoms indicative of painful DPN were receiving treatment.

**Conclusion:** DPN may be underdiagnosed and undertreated in this patient population, which represents a potential opportunity for pharmacists to help patients with diabetes meet their quality of care goals.

**Keywords:** Diabetic peripheral neuropathy, quality of life diabetes.

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The Centers for Disease Control and Prevention (CDC) estimates that 23.6 million people in the United States (7.8% of the population) are living with diabetes, not including an estimated 5.7 million whose condition is undiagnosed.<sup>1</sup> Diabetic neuropathy is one of the most frequent complications of diabetes.<sup>2-4</sup> Diabetic neuropathies are heterogeneous with diverse clinical manifestations. They may be focal or diffuse and are known to affect the sensory, autonomic, and motor neurons of the peripheral nervous system, resulting in major cardiovascular, gastrointestinal, and sensorimotor dysfunction.<sup>5</sup> The prevalence of some form of neuropathy has been reported to be as high as 66% in type 1 diabetes and 59% in type 2 diabetes.<sup>2-4</sup>

Chronic sensorimotor distal symmetric polyneuropathy, also known as diabetic peripheral neuropathy (DPN), is the most common of all diabetic neuropathies.<sup>2,3,5,6</sup> Many patients with DPN are asymptomatic, and a diagnosis only can be made during a routine neurological exam or, in some cases, when the patient presents with a painless foot ulcer.<sup>5</sup> However, up to 50% of patients with DPN will experience neuropathic

pain, typically characterized by burning, tingling, electric, sharp, shooting, lancinating, or deep aching pain, numbness, paresthesia, hyperalgesia, and allodynia, that initially starts in both feet and may progress to involve calves, fingers, and hands (i.e., “stocking and glove” pattern).<sup>2-7</sup> Symptoms tend to worsen at night and may be difficult to describe.<sup>8</sup> Patients who have chronic neuropathic pain associated with DPN are at risk for foot ulceration and subsequent infection—the leading cause of nontraumatic lower-limb amputation in the Western world.<sup>7</sup>

The prevalence of painful DPN generally ranges from 10% to 20% of patients with diabetes and from 40% to 50% of those with diabetic neuropathies.<sup>2-4</sup> Davies et al.<sup>9</sup> reported an overall prevalence of painful DPN of 26.4% among patients with type 2 diabetes in the United Kingdom.

Painful DPN usually is insidious in onset and may be the presenting feature in people with type 2 diabetes.<sup>8</sup> The American Diabetes Association (ADA) recommends DPN screening for all patients at diagnosis and at least annually thereafter.<sup>10</sup> According to ADA, the first step in managing patients with DPN is stable and optimal glycemic control; however, many patients will require pharmacological treatment for painful symptoms.<sup>10</sup> Despite the increasing evidence base for the rational treatment of painful DPN, recent studies have suggested that management of patients with painful DPN often is suboptimal, with low utilization rates of medications.<sup>3,11-13</sup> Research by Gore et al.<sup>12</sup> revealed that only 22.4% of patients with painful DPN were satisfied with their medication therapy.

Painful DPN can have debilitating consequences with a substantial impact on quality of life and costs of management. Specific domains of health-related quality of life affected by painful DPN include patient-reported interference with general activity, mood, mobility, work, social relations, sleep, recreational activities, and enjoyment of life.<sup>2,3,11,12</sup> The presence of painful DPN in patients with diabetes has been associated with considerably greater comorbidity, including twice as many limb infections and nearly tenfold greater limb amputations, greater health care service use, and higher costs compared with patients with diabetes without DPN.<sup>14</sup> The likelihood of any hospital admission for painful DPN patients was more than 2.5-fold higher relative to patients without painful DPN, and the annual excess cost associated with painful DPN was estimated to be almost \$6,000.<sup>14</sup>

## Objectives

We sought to (1) assess the prevalence of painful DPN at an internal medicine clinic in Chicago, (2) evaluate the impact and experience among patients with painful DPN, and (3) assess the satisfaction with care among patients with painful DPN.

### At a Glance

**Synopsis:** The results of this study in 71 patients with diabetes indicated that diabetic peripheral neuropathy (DPN) may be underdiagnosed and undertreated in this patient population. More than one-half (54%) reported burning, aching, or tenderness in hands, arms, legs, or feet, while only 22% stated they had a diagnosis of DPN. Only 14% of patients reporting neuropathic pain were on a medication indicated for neuropathic pain, and of those patients, only 46% were satisfied with their treatment. More than 50% of those with nerve pain had experienced the pain for more than 1 year. Most complained of pain in their feet/hands (72.2%). During a 1-day period, 38.8% of patients reported a pain frequency of “all day.”

**Analysis:** Assessing the etiology of pain among patients with diabetes may lead to appropriate treatment and potential improvement in quality outcomes. Although complete resolution of pain would be ideal for patients with painful DPN, evidence indicates that most patients experience a 30% to 50% reduction in pain and improved function with adequate pharmacologic therapy. Pharmacists can play an important role in helping identify patients with painful DPN and assisting them in receiving the appropriate care. When discussing diabetes management with patients, pharmacists can inquire about painful tingling or burning in hands or feet and other hallmark signs of painful DPN.

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