

Diabetic Neuropathy: Prepared by Lila Landowski and Adrian West

Diabetic neuropathy is a complication of both Type 1 and 2 diabetes that specifically affects nerves and the way they function. The true prevalence of diabetic neuropathy remains elusive due to lack of a unified protocol for diagnosing the disorder. Estimates would suggest that diabetic neuropathy affects at least 50% of people with diabetes, however the use of highly sensitive diagnostics can detect signs of neuropathy in up to 90% of diabetic patients. A diagnosis of diabetic neuropathy significantly increases the risk of death¹.

Diabetes itself is a disease of pandemic proportions; 2011 estimates indicate that 8.3% of the world population has diabetes, with an additional 6.4% having pre-diabetic impaired glucose tolerance². Both diabetics and pre-diabetics are susceptible to diabetic neuropathy. With these statistics, it is therefore not surprising that diabetic neuropathy is the most common form of neuropathy in developed countries. Given the increasing incidence of diabetes worldwide, the prevalence of diabetic neuropathy is certain to follow.

Diabetes places the nerves in the body under considerable chemical stress, and neuropathy occurs when nerves are injured as a result of these stresses. The injured nerves may degenerate, retract and/or grow aberrantly, leading to the symptoms of diabetic neuropathy. There are a myriad of symptoms, including a loss of sensation, 'pins-and-needles,' debilitating "neuropathic" pain or weakness; often first affecting the feet and hands. Loss of sensation allows the formation of diabetic ulcers and physical injuries to go unnoticed. Inadvertent neglect of these injuries leads to serious infection, which in turn can lead to amputation of the affected limb. 50-75% of non-traumatic amputations in the hospital setting are due to complications arising from diabetic neuropathy³. Neuropathic pain from diabetic neuropathy has a significant effect on an individual's quality of life, including impairment of sleep, emotional well-being, decreased mobility and decreased social engagement.

The treatment of diabetic neuropathy remains challenging, as there is no standard management plan for treatment of the disease. Treatment options include pain relief, antidepressants, anticonvulsants, and capsaicin, a topical agent which reduces debilitating pain by stopping nerves from growing in that area⁴. These agents address the symptoms but they do not affect the underlying pathology. In addition, statins and ACE inhibitors have been found to slow the progression of the disease. At present there is no treatment that can cure or reverse the damage to nerves in diabetic neuropathy. The development of a safe and efficacious method to enhance functional nerve regeneration in the peripheral nervous system has been the goal of researchers for many years in the field of neuropathy research.

¹. Hsu WC *et al* (2012) Somatic neuropathy is an independent predictor of all- and diabetes-related mortality in type 2 diabetic patients: a population-based 5-year follow-up study (KCIS No. 29). *Eur J Neurol*

². International Diabetes Federation (2010)

³. Caputo GM, et al (1994) Assessment and management of foot disease in patients with diabetes. *N Engl J Med*;331:854-860.

⁴. Vinik A. Diabetic Neuropathy: Pathogenesis and Therapy. *Am J Med* 1999;107 (2B):17S-26S.