CHAPTER 14

DIABETIC SOMATIC NEUROPATHY

Zdravko A. Kamenov* and Latchezar D. Traykov

University Hospital Alexandrovsko, Medical University - Sofia, Sofia, Bulgaria

*Corresponding Author: Zdravko A. Kamenov—Email: zkamenov@hotmail.com

Abstract: Diabetic neuropathy (DN) is the most common, most neglected and difficult to treat diabetic complication. It affects the whole body, and presents with diverse clinical pictures. The most important outcome of somatic and autonomic DN are the development of diabetic foot followed by diabetic ulceration and possible amputation. In this chapter the definition, epidemiology, pathophysiology and classification of somatic DN will be discussed. Attention will be given to various practical aspects of somatic DN of different types with their specific clinical presentation, diagnostic approaches and treatment options, including the usually rarely discussed gender differences. DN remains a problem in diabetology, compared to other micro- and macrovascular complications. The disease is rarely investigated, although simple testing devices for somatic nerve impairment exist, and remains difficult to treat because of the complex pathogenetic mechanisms. The main prevention/progression delaying measure for the progression of DN is the tight glycaemic control. Painful DN is common and need appropriate symptomatic relieving drugs. Future investigations must be targeted on new treatment options.

INTRODUCTION

Epidemiological studies show an increasing prevalence of diabetes mellitus (DM), mostly Type 2 (T2DM) caused by (1) obesity, lifestyle and genetic factors and (2) accelerated screening and diagnostic activity. The increasing awareness of the importance of an aggressive multifactorial approach to control glycaemia, lipid profile, blood pressure and other life expectancy-shortening factors, combined with the therapeutic advances made it possible that the mortality role of acute diabetic complications decreased significantly and diabetic patients live longer than ever. These two aspects—diabetes epidemics and...
longer life of diabetic patients predict increasing role of late diabetic complications in the future, determining the tremendous personal, social and financial impact of the disease.

Diabetic neuropathies (DN) are the most common,\textsuperscript{1-4} most neglected and difficult to treat diabetic complication—a kind of Cinderella of diabetology. Although traditionally attributed to the group of microvascular complications, DN development is based on a more complex network of pathogenetic processes determining wide variety of neural involvement and difficulties in treatment. From the other side, DN affect micro- and macrovessels, followed by this the vicious cycle of tissue, organ and system dysregulation, their malfunction and damage.

The somatic and autonomic DNs are the most important factors for development of diabetic foot followed by diabetic ulceration and possible amputation. According to the International Consensus on the Diabetic Foot (2007)\textsuperscript{5} and the Practical Guidelines for Treatment and Prevention of Diabetic Foot (2008),\textsuperscript{6} DM is the reason that every 30 seconds, somewhere in the world, a lower limb, or part of it, is lost. The life threatening consequences of cardiac and patient-frustrating sequels of other types of autonomic DNs is more difficult to estimate.

In this chapter the definition, epidemiology, pathophysiology and classification of somatic DNs will be discussed. The attention will be given on various aspects of somatic DN—different types with their specific clinical presentation, diagnostic approaches and treatment options. In focus will also be the usually rarely discussed gender differences.

**DEFINITION**

According to San Antonio Consensus Conference (1988) DN is a descriptive term meaning a demonstrable disorder, either clinically evident or subclinical, that occurs in the setting of DM without other causes for peripheral neuropathy. The neuropathic disorder includes manifestations in the somatic and/or autonomic parts of the peripheral nervous system.\textsuperscript{7} Later Boulton et al agreed upon probably the shortest definition given up to date: **DN is the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes.**\textsuperscript{8} The diagnosis cannot be made without a careful clinical examination of the lower limbs, as absence of symptoms should never be assumed to indicate an absence of signs. This definition conveys the important message that not all patients with peripheral nerve dysfunction have a neuropathy caused by diabetes. Confirmation can be established with quantitative electrophysiology, sensory, and autonomic function testing.\textsuperscript{9}

**EPIDEMIOLOGY**

Diabetic neuropathy is among the most common overall acquired disorders of the nervous system and the most common of the peripheral neuropathies.\textsuperscript{10} There is striking diversity in epidemiological information about the prevalence of DN. Analyzing the literature, Vinik et al\textsuperscript{11} found a range of 10-90% diversity. The main reasons for this heterogeneity are methodological (used differently in the sensitivity of diagnostic methods and/or cut-offs) and epidemiological (different in age, type and duration of DM populations).