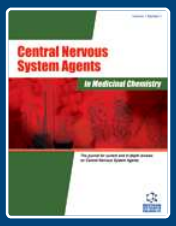

Central Nervous System Agents in Medicinal Chemistry

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Review Article

Current Concepts in the Molecular Mechanisms and Management of Diabetic Neuropathy by Pharmacotherapeutics and Natural Compounds

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Abstract

One of the most crippling effects of diabetes mellitus is diabetic neuropathy, which can cause discomfort, loss of movement, and even amputation. Diabetic neuropathy manifests in a variety of ways, ranging from pain to death. Diagnosing diabetic neuropathy can be challenging since it often goes unnoticed for many years following the onset of diabetes. In addition to oxidative stress in neurons, hyperglycemia activates a number of metabolic pathways that are important sources of damage and possible targets for treatment in diabetic neuropathy. Downstream metabolic cascades caused by prolonged hyperglycemia include activation of protein kinase C, increased production of advanced glycation end products, excessive release of cytokines, increased oxidative stress, and injury to peripheral nerves. Despite the fact that these metabolic anomalies are considered the main cause of diabetes-related microvascular issues, the diverse mechanistic processes of neuropathy are characterized by organ-specific histological and biochemical features. Although the symptoms of diabetic neuropathy can be treated, there are few options to correct the underlying problem. Diabetic neuropathy exerts a tremendous financial, psychological, and physical burden on society, emphasizing the need for efficient and focused treatment. The major goal of this review is to shed light on the multiple mechanisms and pathways that contribute to the onset of diabetic neuropathy and to provide readers with a comprehensive understanding of emerging therapeutic strategies to postpone or reverse various forms of diabetic neuropathy. The article discusses available medications and provides the latest guidelines for the treatment of pain and distal symmetric polyneuropathy, including diabetic autonomic neuropathy, which may help the patients control pain well and assess alternatives for treatment that might be more successful in preventing or delaying the course of a disease.

Keywords: Diabetic neuropathy, Pharmacotherapeutics, Phytochemicals, Molecular mechanisms

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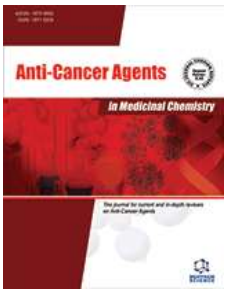

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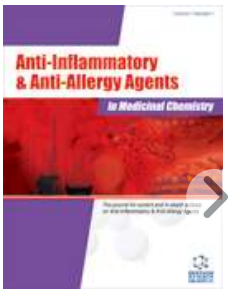

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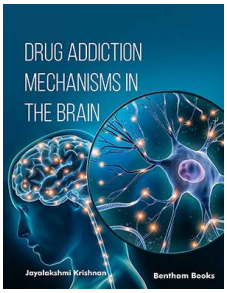

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