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Potential Treatment of Neurological Disorders

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Introduction

The nervous system, which is made up of a complex network of nerves and specialised cells, is in charge of body control and communication. Neurological disorders are diseases of the central and peripheral nervous systems, according to the World Health Organization (WHO), Neurological disorders affect the brain, cranial nerves, peripheral nerves, and spinal cord, and include neurotraumatic diseases like stroke and spinal cord injury, as well as neurodegenerative diseases like Alzheimer's disease (AD) and Parkinson's disease (PD) and neuropsychological disorders like depression and schizophrenia. Neurological illnesses are defined by acute and gradual neuron degeneration, which eventually leads to brain malfunction and neuronal cell death. Alterations in phospholipid metabolism, accumulation of lipid peroxides, mitochondrial dysfunction, protein misfolding, abnormal protein aggregation, decreased cellular energy levels, disturbed calcium (Ca2+) homeostasis, excitotoxicity, oxidative stress, neuroinflammation, dysregulated hormonal signalling, and apoptosis are some of the underlying molecular mechanisms of neurodegeneration.

Description

Throughout the world, neurological illnesses are a leading source of morbidity and mortality. The rising prevalence of neurological disorders, which is linked to an ageing population, has increased the societal burden of these diseases, for which there are currently no viable therapeutic options. As a result, identifying and developing novel therapeutic techniques capable of halting or reversing neuronal loss by targeting the underlying causes of neurodegeneration and neuronal cell death is critical. Plants and other natural products have been investigated as potential sources of neuroprotective secondary metabolites that are safe and naturally occurring. In the rhizomes of the medicinal plant *Acorus calamus*, the secondary metabolites - and -asarone can be discovered in considerable concentrations (L.).

The pharmacological activities of - and -asarone include antioxidant, antiinflammatory, anti-apoptotic, anticancer, and neuroprotective actions. This paper intends to present an overview of current research on the therapeutic potential of - and -asarone in the treatment of neurological illnesses, especially neurodegenerative diseases like Alzheimer's disease (AD), Parkinson's disease (PD), cerebral ischemia disease, and epilepsy. According to current research, - and -asarone protect neurons by reducing oxidative stress, aberrant protein buildup, neuroinflammation, neurotrophic factor deficiency, boosting neuronal cell survival, and activating numerous neuroprotective signalling pathways. Although *in vitro* and *in vivo* animal studies have shown that - and -asarone have beneficial effects, more research is needed to translate laboratory findings into safe and effective therapies for patients with Alzheimer's disease, Parkinson's disease, and other neurological and neurodegenerative diseases [1-5].

Conclusion

The pharmacological properties of - and -asarone contribute to their protective actions against a variety of neurotoxic stressors. The antiinflammatory properties of - and -asarone have been attributed to several potential mechanisms of action, including: (1) antioxidant properties; (2) regulation of various neuroprotective signalling pathways; (3) reduction of aggregate formation and promotion of the clearance of pathogenic protein aggregates; (4) anti-inflammatory properties; (5) inhibition of microglial activation; (6) activation of NTFs-mediated neuroprotection; and (7) modulation of the modulation of the modulation of the modulation These neuroprotective properties make - and -asarone intriguing therapeutic agents for a variety of neurological illnesses, including Alzheimer's disease, Parkinson's disease, cerebral ischemia, and epilepsy. Despite promising preclinical findings, due to the possible toxicity of - and -asarone and their poor bioavailability, successful translation of results from the bench to the clinic has yet to be accomplished. The development of novel delivery systems may lower - and -asarone toxicity and, as a result, provide patients with significant therapeutic benefits.

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