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Palmitoylethanolamide Effectiveness in Combating Neuroinflammatory Diseases and Slowing Progression of Diseases

Robert Weinberg*

Department of Molecular Medicine, Goethe University, Germany

INTRODUCTION

Palmitoylethanolamide, a natural amide of ethanolamine and palmitic acid, is an endogenous lipid compound with multiple pharmacological functions, including analgesic, neuroprotective, immunomodulatory, and anti-inflammatory properties. Although the properties of Palmitoylethanolamide were first characterized almost 65 years ago, the identity of the receptors that mediate these effects has long remained elusive, leading to a paucity of research over the past two decades. With renewed interest in Palmitoylethanolamide, many interesting studies have revealed the pharmacological properties of Palmitoylethanolamide and elucidated its mechanism of action. Recent results demonstrate the ability of Palmitoylethanolamide containing formulations to promote oligodendrocyte differentiation, the first step in proper myelination. This evidence opens up new and promising research avenues. White matter defects have been identified in a large and heterogeneous group of diseases, including age-related neurodegenerative diseases. Here, we summarize the history and pharmacology of Palmitoylethanolamide and discuss its therapeutic potential in repairing white matter defects.

DESCRIPTION

Palmitoylethanolamide is a naturally produced in many plants and an animal food source, mammalian cells and the tissues, has important neuroprotective, anti-inflammatory and the analgesic effects and is a potential dietary supplement. Several efforts have been made to identify the molecular mechanisms of action of the Palmitoylethanolamide and to elucidate its multiple effects in the both the central and peripheral nervous systems. Here, we provide an overview of the pharmacology, efficacy, and safety of Palmitoylethanolamide in neurodegenerative diseases, pain perception, and inflammatory diseases.

Palmitoylethanolamide, which belongs to the class of N-acetylanolamine phospholipids, was first isolated from soybean lecithin, egg yolk and peanut flour. It is currently used to treat many types of neuropathic pain, including fibromyalgia, osteoarthritis, carpal tunnel syndrome, and many other conditions. Morphology has sparked many pioneering studies to evaluate their potential use as therapeutic agents for neurodegenerative diseases. Neurodegenerative diseases are widespread, numerous and diverse worldwide, but share a common clinical picture resulting from the progressive damage to the brain regions involved in mobility, muscle coordination and strength, mood and cognition. The current review aims to describe *in vitro*, *in vivo* and human studies using Palmitoylethanolamide treatment alone or in combination with other compounds in the presence of neurodegeneration. In fact, Palmitoylethanolamide's effectiveness in combating neuroinflammatory diseases and slowing progression of diseases such as Alzheimer's, Parkinson's, Huntington's, frontotemporal dementia, amyotrophic lateral sclerosis and the multiple sclerosis is highlighted are gathering. A literature review demonstrates the effectiveness of his PEA in treating injuries typical of severe neurodegenerative diseases [1-4].

CONCLUSION

A growing body of evidence strongly supports a critical role of neuroinflammation in the pathophysiology of neurodegenerative diseases such as Alzheimer's disease, frontotemporal dementia and amyotrophic lateral sclerosis. As widely reported in animal models and patient studies, neuroinflammation alters synaptic transmission and may contribute to the progression of the neurodegeneration. Recently, formulations of the endogenous lipid mediator palmitoylethanolamide and its novel conjugate, the antioxidant flavonoid luteolin (recognized as palmitoylethanolamide), may have been developed by a micronization process. A therapeutic agent for a variety of diseases identified by its potentially beneficial effects on neu-

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Corresponding author Robert Weinberg, Department of Molecular Medicine, Goethe University, Germany, E-mail: weinbergrobert34@gmail.com

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rodegeneration and neuroinflammation through modulation of synaptic transmission.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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