

Title: Insights on aspects of apoptosis in neurodegenerative disorders: a comprehensive review

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Abstract: Nerve cell death is the central aspect of human neurodegenerative disorders. Neuronal death in results leads to the onset of various human neurological disorders such as Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, and stroke. In developing neurons, apoptosis is assumed to provide a counterbalance to overexuberant cell replication. Numerous signals may induce apoptosis in neurons, such as the absence of neurotrophic factor support, increased levels of metabolic and oxidative stress, and overstimulation of glutamate receptors (leading to the calcium influx). Cell death and neurological disorders have been related to oxidative stress, which creates an imbalance between antioxidant defenses and free radical production. In this paper, a summary of the engrossment of oxidative stress, neuronal apoptosis, and mitochondrial dysfunction in neurodegenerative disorders has been discussed. Antioxidant therapy's potential assistance for neurodegenerative illnesses in human beings is still up for dispute, despite encouraging pre-clinical research findings. One elucidation for this disparity could be the non-existence of an accurate way to assess oxidative stress in the brain. The explosion in research on apoptosis in neurodegeneration has stemmed from the conception that persuading neuronal apoptotic death may be crucial to the progression of a disease and that anti-apoptotic approaches may be useful in the prevention of neurodegenerative processes. A deeper understanding of the role that apoptosis plays in neurodegenerative processes will serve as the foundation for future research into the development of focused, effective treatment modalities.

Keywords: Apoptosis, neurodegeneration, reactive oxygen species, neurons, oxidative stress, cell death

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