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Genetic Disorders of Neurodegenerative Diseases

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Editorial

Genetics has shifted the focus of current approaches to the most common diseases. Discovering the molecular secrets of neurodegenerative illnesses will lead to the development of medications that will alter the natural course of the disease, altering patient quality of life and mortality. Sequencing candidate genes in patients with neurodegenerative diseases is faster, more precise, and less expensive, allowing algorithms to be proposed for predicting the risk of neurodegeneration in healthy people, including the year of beginning and the severity of the disease.

Exome sequencing or whole gene sequencing for linking phenotypic expression with genetic alterations in proteins with critical activities has resulted in an explosion of studies about the diagnosis of neurodegenerative illnesses employing next generation sequencing. Many of these are found in neural glia, where they can cause a proinflammatory response, resulting in faulty proteins that cause sporadic or familial mutations. This article discusses genetic diagnosis techniques as well as the use of bioinformatics in understanding neurodegenerative disease outcomes. In order to define prevention methods or an early start for giving drugs in the absence of symptoms, risk scores for diseases with a high occurrence in healthy persons must be established in the near future.

Understanding of changed molecular pathways in cells from various physiological organs has led to advancements in chronic illness therapy. One of the most intriguing developments in genetics over the last decade has been the development of new sequencing techniques for detecting genotypic aberrations that lead to the identification of faulty phenotypic expressions utilising huge bioinformatic databases. The practise of sequencing a genome or exome for clinical purposes has now become commonplace. Thousands of tests have already been ordered for people seeking a diagnosis for rare diseases that are clinically unidentifiable or perplexing but are thought to have a genetic cause.

The brain, spinal cord, and nerves are all affected by neurological diseases. There are over 600 neurological diseases [1], with the most common being genetic (such as Huntington's disease); developmental disorders (such as cerebral palsy and spina bifida); degenerative diseases (such as Alzheimer's Disease (AD) and Parkinson's Disease (PD); cerebrovascular diseases (such as stroke); physical injuries to the brain, spinal cord, or nerves; seizure disorders (such as epilepsy); and degenerative diseases (such as Alzheimer's disease (AD) and Parkinson Gliomas (brain tumours); infection (meningitis); mental disorders (e.g., bipolar disorder and schizophrenia); sleep disorders (insomnia); and addiction diseases (alcoholism) [2].

Many triggering factors lead to the mutation of genes altering proteins implicated in the development of neurodegeneration, such as the beta amyloid protein in Alzheimer's Disease (AD), the alpha-synuclein protein in Parkinson's Disease (PD), and the superoxide dismutase (SOD)-1 mutation in Amyotrophic Lateral Sclerosis (ALS), as discussed later [3]. Motor neurodegeneration is not caused by selective expression in astrocytes and microglia per se [4,5], showing that surrounding cells play an important role during neuron activation.

Other studies have focused on the proinflammatory factor related with microglial neurotoxicity by eliminating factors like TNF-alpha or interleukin beta, which were found to have a minor influence on survival. The biochemical processes that cause these reactions in the glia are complicated, and they injure motor neurons. Therapeutic therapies aimed at specific cells are being investigated. A deeper understanding of the molecular and genetic processes involved in neuroinflammation will aid in defining their role in ND physiopathology, as well as discovering novel therapeutic approaches for delaying or varying neurodegenerative reactions.

The proliferation of articles/material announcing the efficacy of genetics in detecting genetic risk factors and discussing diagnosis specificity is not limited to the field of neurology. Because of their significant impact on morbimortality in adult patients, NDs have been the subject of extensive genetic research. As a result, the purpose of this paper is to evaluate current advancements in the genetic diagnosis of the following ND: AD, PD, and ALS.

Conflict of Interest

None.

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