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Short Commentary Open Access

Keynotes on Viral Infections of the Central Nervous System: Diagnosis & Treatment Methods

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Introduction

Human disease is caused primarily by viral infections. While most viruses replicate in peripheral tissues, a few have evolved specific strategies for moving into the nervous system, where they can cause acute or chronic infections. Viruses use a range of tactics to get through defensive barriers and into the CNS. Haematological entry mechanisms, such as direct infection of vascular endothelium or travelling in immune cells through CNS barriers through a 'Trojan horse' system, are among these techniques. Viruses may also get into peripheral nerves that aren't protected by the CNS. Infections of the central nervous system (CNS) can disrupt homeostasis, cause neurological dysfunction, and lead to severe, potentially fatal inflammatory diseases. The methods used by neurotropic viruses to cross the CNS barrier structures, as well as how the immune system recognises and reacts to viral infections in the CNS, are the subject of this study. Immune monitoring of chronic and latent viral infections, as well as recent insights gained from imaging both protective and pathogenic antiviral immune responses, are given special attention [1].

Diagnosis

If not diagnosed and treated early enough, CNS infections can be fatal. Many CNS infections have nonspecific clinical presentations, rendering a conclusive etiologic diagnosis difficult. Molecular methods based on nucleic acid *in vitro* amplification are increasingly being used for routine microbial detection. Viral culture and serology are standard laboratory procedures that only include circumstantial or retrospective evidence of viral infections of the central nervous system. These approaches are much superior to traditional techniques, offering faster results as well as greater sensitivity and precision. Furthermore, molecular approaches based on cerebrospinal fluid samples are now considered the current gold standard for diagnosing CNS infection caused by pathogens that are difficult to detect otherwise. Various monoplex and multiplex PCR assays are available on commercial diagnostic platforms for fast testing of targets that cause similar clinical illness. In this case, pan-omic molecular platforms may be useful. While molecular methods are expected to become more commonly used in diagnosing and tracking CNS infections, the findings of these methods must be carefully interpreted in conjunction with other data [2].

Neurodegenerative diseases are characterised by the loss of neurons in particular areas of the brain that is progressive and permanent. Parkinson's disease (PD) and Huntington's disease (HD), in which neurons from the basal ganglia are lost, cause defects in movement control; Alzheimer's disease (AD), in which hippocampal and cortical neurons are lost, cause memory and cognitive impairment; and amyotrophic lateral sclerosis (ALS), in which neurons from the basal ganglia are lost, cause memory and cognitive impairment; and amyotrophic lateral sclerosis (ALS), in (ALS).

Treatment Methods

The current treatments for neurodegenerative diseases only treat the symptoms of the disease, not the underlying neurodegenerative mechanism. In cases where the neurochemical deficit caused by the disease is well known, symptomatic treatment for PD is generally satisfactory, and a variety of effective agents are available. The efficacy of available symptomatic therapies for Alzheimer's disease, Huntington's disease, and ALS is much lower. Pharmacological therapies aimed at halting or slowing the development of neurodegeneration is on the horizon. A broad variety of disease-modifying treatments has the potential to revolutionise the way neurodegenerative diseases are diagnosed and treated.

References

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