



The Importance of Molecular Biomarkers has been Increasingly Recognized, but their Validation Requires a Lengthy Process

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INTRODUCTION

According to recent estimates, neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, multiple sclerosis, stroke and vascular dementia are the leading causes of poor quality of life for older people worldwide. Although the molecular connections and underlying mechanisms underlying the pathophysiology of neurodegenerative diseases are now well understood, the exact mechanisms remain unknown. Therefore, finding important diagnostic markers and therapeutic targets is of great importance. Biomarkers have been continuously introduced into clinical procedures and clinical trials in the field of neurodegenerative diseases over the past decades. The neurodegenerative disease biomarker pool is likely to continue to grow as our ability to adequately assess many biological factors and our understanding of the pathophysiology of neurodegenerative diseases improves. Biomarkers are used for a variety of purposes, including guiding clinical diagnosis, assessing disease risk or prognosis, determining disease staging, and monitoring disease progression or response to treatment.

DESCRIPTION

Neurological disorders such as Alzheimer's and related disorders, Parkinson's disease, ataxia, stroke, Huntington's disease, diabetic neuropathy, multiple sclerosis, motor neuron disease, progressive supranuclear palsy, vascular dementia, and peripheral neuropathy. The discovery and delivery of biomarkers for degenerative diseases has changed in recent decades. The ability to measure CNS and blood indicators in one convenient location opens up the possibility of using biomarkers to track disease progression in clinical practice or clinical trials. Therefore, the purpose of this special issue is to collect new articles examining the innovation and development of molecular bio-

markers in neurodegenerative diseases, as well as the clinical applications of biomarkers. We welcome original research and review articles to better understand the importance of different biomarkers in neurodegenerative diseases.

Multiple Sclerosis (MS) is a chronic autoimmune disease characterized by inflammatory demyelination and neurodegeneration in the Central Nervous System (CNS). The disease shows great heterogeneity with respect to radiological and histopathological changes, clinical presentation and course, and response to treatment. Therefore, it is of great importance to define specific features of the disease that facilitate diagnosis and prognosis and allow assessment of treatment response and risk of side effects. CNS lesion burden currently determined by Magnetic Resonance Imaging (MRI) and clinical features. Recurrence rate and disability progression, the most important role. Quantification and standardization of these characteristics is possible in larger groups of patients, but not in individual patients. Molecular biomarkers, on the other hand, are easily quantified and can perfectly complement MRI and clinical features. Due to the underlying pathophysiological mechanisms, MS biomarkers come from the fields of immunology and neurobiology.

CONCLUSION

In recent years, the importance of molecular biomarkers has been increasingly recognized, but their validation requires a lengthy process, so only a few biomarkers are routinely used in clinical practice. However, the number of potential biomarkers at different stages of testing is promising. This overview describes the properties an ideal MS biomarker should have and the challenges in establishing new biomarkers. In addition, clinically relevant and promising blood and cerebrospinal fluid biomarkers useful in the diagnosis and prognosis of MS, and in assessing treatment response and side effects are presented.

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Suitable biomarkers for MS diagnosis should be able to distinguish MS patients from healthy and other diseases.

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CONFLICT OF INTEREST

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