Advances in neuroimaging techniques have made it possible to more clearly elucidate the neural basis of psychiatric and neurologic disorders. In the past few decades, neuroimaging analysis has served as the main tool for exploring neurobiological etiology of psychiatric and neurologic disorders. A growing number of studies have found evidence of structural and functional changes in the neural circuits associated with pathophysiology of psychiatric and neurologic disorders. Furthermore, recent neuroimaging studies have suggested that aberrant functional connectivity in neural circuits plays a pivotal role in the etiologies of psychiatric and neurologic disorders. In addition to functional dysfunction in brain networks, other neuroimaging biomarkers may include structural brain changes such as cortical abnormalities in volume, thickness, folding patterns, microstructural connectivity of white matter tracts, and alterations in the shape of subcortical structures. Considering the high socioeconomic burden of psychiatric and neurologic disorders, neuroimaging biomarkers may be a valuable and cost-effective tool for selecting treatment options or predicting prognosis. For example, it has recently been proposed that functional and structural brain alterations could predict outcomes of various treatment modalities such as antidepressant treatment, psychotherapy, and elective convulsive therapy; or be used to predict treatment-resistance in depression. Furthermore, the development of neuroimaging biomarkers in psychiatry and neurology facilitates a move away from previously common phenomenological definitions and categories of brain diseases toward neurobiological evidence-based nosology. The traditional output from a neuroimaging study was a human brain map summarizing group-level differences in functional and structural measurements between a given sample of patients and healthy subjects. This information is of limited utility in clinical practice. Recently, there has been a spotlight on machine learning, numerous artificial intelligence methods, and statistical learning because of their potential to facilitate the development of individual-level neuroimaging markers. Specifically, machine learning approaches have proven to be effective tools for tackling the challenges of analyzing high-dimensional data like those generated by magnetic resonance imaging. Identifying neuroimaging biomarker of psychiatric and neurologic disorders will lead to more precise diagnosis, improved prediction of treatment response, and better risk assessment for future psychiatric and neurologic disorders onset. This special issue aims to review research that focuses on developing neural markers for diagnosis and prediction of treatment response in psychiatric and neurologic disorders through the lens of brain network dysfunction and neurostructural changes.

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