



# Investigational Studies and Relationship between EEG Microstates and Clinical Symptoms

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## ABOUT THE STUDY

Electroencephalography (EEG) is a useful technique for studying how the brain works, and microstate abnormalities have frequently been linked to schizophrenia in individuals. In this study, the dynamics of EEG microstates in First-Episode Schizophrenia (FE-SCH) patients who were drug-naïve were examined, as well as the correlation between EEG microstates and clinical symptoms.

Schizophrenia is a serious mental illness with a lifetime frequency of about 1% that typically manifests in early adulthood and has a complex aetiology, protracted course, considerable functional impairment, and poor prognosis. This illness has placed a significant burden on the patients, their families, and the healthcare systems. It is one of the main causes of disability in the globe. There is evidence that long-term psychosis left untreated can have negative functional effects. In order to reduce the risk for deterioration associated with the chronic and repeating process of the disease, it is essential to have a better understanding of schizophrenia in its early stages. This information will help with early detection and intervention.

According to the pathophysiological theory of schizophrenia, there may be weak connections both between and within different brain networks as a cause of the illness. A technique called Electroencephalography (EEG) can be used to examine the neuronal synchronisation related to the pathophysiology of schizophrenia since it is based on an integrative, intricate, and in vivo model of brain activities. The great temporal resolution of the resting-state EEG allows it to record the rapidly varying dynamics of brain networks. Additionally, this technique enables a non-invasive evaluation of neuronal processes that may be the result of both intimate and widespread neural coordination. In EEG data, distinct topographies often persist for 80–120 microseconds before changing.

Several prior investigations, the majority of which comprised patients with chronic illnesses or a mixed sample with no restrictions on the course of disease, have seen and documented the abnormalities of EEG microstates in patients with schizophrenia. An accurate diagnosis and prompt treatment during this time can help prevent the disruption of a protracted course and frequent bouts of the disease. The early stage for schizophrenia marks the shift from the premorbid to the morbid condition. Studies on the early-stage characteristics of schizophrenia must therefore include first-episode patients who have psychosis. According to one study, first-episode psychosis patients and persistent schizophrenia patients both exhibited similar microstate dynamics, including increased microstate C, decreased microstate D, and shorter durations of microstate B when compared to healthy controls.

Patients with FE-SCH had higher microstate class C and lower microstate class D, which is consistent with several earlier research. These microstate class C and D anomalies have been found in chronic schizophrenia patients, people at extremely high risk of psychosis, and even siblings of schizophrenia patients. In individuals with schizophrenia, the prevalence of microstate classes C and D increased and decreased, respectively, according to two meta-analyses that were recently published. The patterns of resting-state EEG microstates, particularly for microstate classes C and D, have also been suggested by some researchers as a potential endophenotype of schizophrenia.

Schizophrenia first-episode patients may have higher levels of microstate class C and lower levels of microstate class D. Additionally, we discovered a link between microstate class D and favourable symptoms. These outcomes are consistent with earlier research. Additionally, it's possible that the deviant microstate classes C and D reflect the underlying pathophysiology of schizophrenia, which could be useful information in identifying individuals with schizophrenia and the creation of intervention plans.

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**Received:** 01-Sep-2022, Manuscript No. GJBAHS-22-18501; **Editor assigned:** 05-Sep-2022, PreQC No. GJBAHS-22-18501(PQ); **Reviewed:** 19-Sep-2022, QC No GJBAHS-22-18501; **Revised:** 26-Sep-2022, Manuscript No. GJBAHS-22-18501(R); **Published:** 03-Oct-2022. DOI: 10.35248/2319-5584.22.11.143

**Citation:** Wang C (2022) Investigational Studies and Relationship between EEG Microstates and Clinical Symptoms. Glob J Agric Health Sci. 11:143.

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