



Review

Neuropsychiatric evaluations of postictal behavioral changes

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ABSTRACT

Postictal behavioral changes (PBCs), including psychosis, aggression, and mood change, are commonly observed in patients with epilepsy. Recognition and description of the clinical manifestations of PBCs would help in understanding and treating patients. Additionally, various quantified objective scales that are widely available in clinical psychiatry could be used to assess the clinical symptoms of PBCs. There are few reports in which objective rating scales have been used to assess neuropsychiatric symptoms in patients with epilepsy. However, there have been a small number of studies on interictal psychosis and depression in which either the Brief Psychiatric Rating Scale or the Hamilton Depression Scale was used. These inventories are likely to be useful for the assessment of PBCs. Other rating scales used for schizophrenia, depression, mania, and aggressive behavior are reviewed here. The author suggests that cross-sectional and longitudinal neuropsychiatric measurement combined with other modalities, including functional neuroimaging, could provide clues to the pathophysiology of PBCs.

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1. Introduction

Postictal behavioral changes (PBCs) are commonly observed in people with epilepsy. PBCs include confusion, aggression, psychosis, and mood changes. Patients with PBCs may sometimes exhibit violent and destructive behavior that bothers or scares the people around them and potentially damages their reputations, causing a decline in quality of life. On the other hand, PBCs are sometimes difficult to recognize as a seizure-related phenomenon that is essentially transient, partly because some PBCs, such as postictal psychosis, may occur after an interval of a few days without any definite clinical signs and may continue for a long period lasting up to a few weeks [1–5]. These features of PBCs may lead to the misunderstanding that these individuals have violent personality traits. It is therefore important to clarify the nature of PBCs and make it known to everyone.

Recognition and description of the clinical manifestations of PBCs would help in understanding and treating patients. However, clinical characteristics of PBCs are yet to be fully evaluated, partly because of the difficulty involved in assessing the various symptoms during the very brief postictal period. Most previous studies have conducted qualitative rather than quantitative analysis of PBCs [2,5–8]. Introduction of quantitative evaluation methods would open different lines of research on PBCs.

In clinical psychiatry, a number of quantitative batteries have been employed to assess the psychopathology of various psychiatric disorders. Those tests may also be applicable to the assessment of psychiatric PBCs. Administration of the tests is encouraged in future

studies. There are two types of evaluation: one is objective scoring by clinicians through patient interviews or behavioral observation; the other is subjective self-reporting by patients. With respect to PBCs, objective rating scales may be more practical, because patients with psychosis or aggression usually lack insight into their condition, and a subjective scale may not accurately reflect their mental state. In addition, as some PBCs may be associated with impairment of consciousness and memory disturbance, it could be difficult for patients with PBCs to complete the self-rating questionnaire.

In this article, several objective psychiatric rating scales used for various psychiatric disorders, including schizophrenia, aggression, depression, and mania, are introduced. Moreover, possible clinical applications of these methods to the evaluation of PBCs are proposed.

2. Neuropsychiatric test

2.1. Evaluation for psychosis

Psychosis is characterized by delusions, hallucinations, or a limited number of severe abnormalities of behavior such as gross excitement, marked psychomotor retardation, and catatonic behavior [9]. Schizophrenia is the disease most representative of the psychotic state. Many widely used inventories have been developed to assess symptom severity and therapeutic effect in patients with schizophrenia.

2.1.1. Brief Psychiatric Rating Scale

The Brief Psychiatric Rating Scale (BPRS) is one of the most widely used scales in psychiatric research [10]. It consists of 18 items, each of which is rated on the scale from 1 = absent to 7 = extremely severe and is administered in a semistructured interview by experienced

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psychiatrists (Table 1). This scale is commonly used to evaluate psychiatric symptoms in schizophrenia including positive symptoms, such as delusion and hallucination, and negative or residual symptoms, such as blunt affect and motor retardation. It also covers nonpsychotic symptoms such as anxiety and depression. It is relatively easy to rate according to BPRS guidelines, and interrater reliability is high. The results are usually analyzed with total scores and factorial analysis.

There have been very few studies on psychotic symptoms in patients with epilepsy that have employed the BPRS [11–13]. Adachi et al. [11] evaluated clinical symptoms of postictal psychosis using a modified version of the BPRS and compared these symptoms with those of interictal psychosis in patients with frontal and temporal lobe epilepsy. Patients with frontal lobe epilepsy were found to exhibit more pronounced negative symptoms, including emotional withdrawal and blunted affect, in interictal psychosis than in postictal psychosis.

2.1.2. Positive and Negative Syndrome Scale

The Positive and Negative Syndrome Scale (PANSS) was developed to assess symptoms of schizophrenia and other psychotic disorders [14]. It comprises 30 items on three subscales: 7 items covering positive symptoms (hallucinations and delusions), 7 covering negative symptoms (blunted affect and social withdrawal), and 16 covering general psychopathology (somatic concern, anxiety, and depression). Each item is scored on an item-specific scale ranging from 1 to 7. The PANSS has become a standard test for assessing the efficacy of antipsychotic drugs in drug trials. A 20% reduction in PANSS total score has been employed as the criterion for response to several new antipsychotic drugs.

There are only a few studies that have used the PANSS for the evaluation of psychotic symptoms in patients with epilepsy. Tadokoro et al. [15] compared the psychopathology of patients with interictal psychosis with that of patients with schizophrenia. A significant difference in the results on the negative subscales of the PANSS was noted between these patient groups. The response rate to antipsychotic drugs was also investigated based on the reduction in positive and negative scores of the PANSS. Another study [16] assessed interictal psychiatric symptoms using the PANSS in patients with temporal lobe epilepsy and found that most patients had higher scores on the negative subscale than on the positive subscale.

2.1.3. Neuropsychiatric Inventory

The Neuropsychiatric Inventory (NPI) was developed to assess a wide range of behaviors encountered in patients with dementia [17]. It is a validated informant-based interview that determines the frequency and severity of behavioral changes. It has been shown to have

adequate test–retest and interpreter reliability and has also been used for patients with Parkinson's disease and multiple sclerosis. The NPI consists of 10 items: delusions, hallucinations, dysphoria, anxiety, euphoria, aggression, apathy, irritability, disinhibition, and aberrant motor behavior. For each item, severity is rated from 1 to 3 and frequency from 1 to 4.

Recently, Krishnamoorthy and Trimble [18] used the NPI to test patients with epilepsy, and the results showed a good correlation with the BPRS. Because it has fewer questions than the BPRS, the NPI may be used to evaluate psychiatric symptoms quickly. Therefore, this scale may be a more suitable inventory for patients with difficulty in verbal communication.

2.2. Evaluation for mood disorder

Mood changes, including depression during the postictal period, are commonly experienced by patients with epilepsy [19]. Kanner et al. [6] reported that 43 of 100 patients with intractable epilepsy experienced postictal depression and that 13 of these patients had suicidal ideation. A hypomanic state with excessive energy and racing thoughts was identified in 22 patients in that study. Recent studies have shown that the postictal manic state is not as rare as was previously assumed [20–22]. Additionally, it is noteworthy that mood changes, which are often mixed with manic features, are frequently observed in postictal psychosis [23]. However, subtle postictal mood changes may easily be overlooked, and close observation of these phenomena is needed to clarify their prevalence and clinical features. In contrast, although quantitative objective scales have been used less frequently than subjective self-rating scales, including the Beck Depression Inventory [24], there are numerous studies on interictal depressive symptoms in epilepsy. A combination of objective and subjective rating scales would result in further findings on postictal mood changes.

2.2.1. Hamilton Depression Scale

The Hamilton Depression Scale (HAMD) is one of the most widely used depression scales in drug trials. It consists of 21 items; 11 items are rated on a 5-point scale and 10 on a 3-point scale, resulting in a total score ranging from 0 to 64 [25]. A clinician evaluates various depressive symptoms such as depressed mood, feelings of guilt, thoughts of suicide, and sleeping habits (Table 2). The guide for the structured clinical interview was developed by Williams [26]. The HAMD can be used to assess the severity of symptoms, and

Table 1

Items evaluated with the Brief Psychiatric Rating Scale.

1. Somatic concern
2. Anxiety
3. Emotional withdrawal
4. Conceptual disorganization
5. Guilt feelings
6. Tension
7. Mannerisms and posturing
8. Grandiosity
9. Depressive mood
10. Hostility
11. Suspiciousness
12. Hallucinatory behavior
13. Motor retardation
14. Uncooperativeness
15. Unusual thought content
16. Blunted affect
17. Excitement
18. Disorientation

Table 2

Items evaluated with the Hamilton Depression Scale.

1. Depressed mood
2. Feelings of guilt
3. Suicide
4. Insomnia, initial
5. Insomnia, middle
6. Insomnia, delayed
7. Work and interest
8. Retardation
9. Agitation
10. Anxiety, psychic
11. Anxiety, somatic
12. Somatic symptoms, gastrointestinal
13. Somatic symptoms, general
14. Genital symptoms
15. Hypochondriasis
16. Loss of weight
17. Insight
18. Diurnal variation
19. Depersonalization and derealization
20. Paranoid symptoms
21. Obsessional and compulsive symptoms

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