

Suppression of the P50 auditory evoked response is the intact ability to appropriately filter out non-novel stimuli. This process is important for the completion of day-to-day tasks without distraction, as well as for the identification of novel stimuli. Patients with schizophrenia exhibit poor P50 suppression (1, 2). In persons with bipolar disorder, poor P50 suppression has been associated with severity of clinical symptoms (3) and elevated catecholamine levels (4, 5). This deficit has also been observed in subjects with bipolar disorder and a history of psychosis, as well as in subjects with schizoaffective disorder, bipolar type, regardless of current clinical symptom state (6).

Smooth pursuit eye movement is used to maintain foveal position on either a moving object or a stationary object when the head is in motion. Smooth pursuit deficits are some of the most replicated and long-standing impairments documented in patients with schizophrenia (7–9). Impairment is present in stable (10) and neuroleptic-free patients (11), and by the first episode of illness (12). The most specific abnormality of smooth pursuit performance in patients with schizophrenia is the loss of the ability to inhibit the intrusion of small anticipatory (or leading) saccades (13, 14). Multiple studies have documented abnormal smooth pursuit performance in persons with bipolar disorder using quantitative global measures such as gain, log signal to noise ratio, or root mean square measurements (11, 15–20). Of the seven negative studies using these quantitative measures, five found nonsignificant impairment of performance in bipolar subjects (12, 21–24). Of the remaining two negative quantitative studies (25, 26), one examined only two individuals with bipolar disorder (25). The frequency of leading saccades during smooth pursuit eye movement has not been previously studied in persons with bipolar disorder.

The antisaccade task measures the ability to inhibit the prepotent urge to look quickly toward a peripheral target. This inhibition is measured by asking the subject to fixate on a central object and, when a peripheral target appears, to look in the opposite direction. The number of times that a person looks toward the target (a prosaccade error) rather than away from the target (an antisaccade) measures the failure to inhibit the prepotent response. Antisaccade task performance is impaired in persons with schizophrenia (27). Prosaccade errors are present early in the course of illness (28), during remission (29), and in neuroleptic-free patients (30). In persons with bipolar disorder, no impairment (31), nonsignificant impairment (30), and significant impairment (32–35) have been reported.

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