

ELECTROENCEPHALOGRAPHIC SLEEP ABNORMALITIES IN SCHIZOPHRENIA: RELATIONSHIP TO POSITIVE/NEGATIVE SYMPTOMS AND VENTRICULAR ENLARGEMENT

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Sleep electroencephalographic (EEG) studies in schizophrenic patients have documented a variety of abnormalities, including reduced slow-wave sleep (SWS) and decreased rapid-eye-movement (REM) latencies. Little is known, however, about the association of these findings with positive/negative and other aspects of schizophrenic symptomatology and structural abnormalities in schizophrenia. To evaluate the frequency and nature of sleep EEG abnormalities in schizophrenia and their association with positive/negative symptoms and head computerized tomography (CT) findings, we recorded EEG sleep in 13 inpatients who met DSM-III-R and RDC criteria for schizophrenia at drug-free baseline (minimum of two-weeks medication-free) and after about four weeks of treatment with neuroleptics. At both timepoints, EEG sleep was monitored for two consecutive nights, the data from the second night being used for analysis. At both phases, patients were rated for positive, negative and depressive symptoms using the BPRS subscale, SANS, and Hamilton depression rating scales respectively. Head CT scans without contrast were performed and planimetric measurements of ventricular brain ratio (VBR), and maximum width of the third ventricle obtained. Data were analyzed by computing Pearson correlation coefficients between the sleep variables, symptom ratings, and CT scan variables.

Seven of the 13 patients showed abnormally low REM latencies (<60 minutes) at baseline. REM latency was inversely correlated to the severity of negative symptoms at baseline ($r=0.60$, $N=13$, $p<0.05$), there being no difference between previously never-medicated ($N=5$) and medicated ($N=8$) patients. No association with global severity, positive or depressive symptoms was noted. Minutes of SWS were also negatively correlated with negative symptom severity ($r=-0.69$, $N=13$, $p<0.01$), but not with any other clinical parameter. After four weeks of neuroleptic treatment, REM latency and minutes of SWS continued to correlate negatively ($p<0.05$) with the severity of negative symptoms at that timepoint. Third ventricular width and VBR were correlated with negative symptom severity at baseline. Third-ventricular width, but not VBR, was negatively correlated with REM latency ($r=-.62$, $N=13$, $p<0.05$) and minutes of SWS ($r=-0.72$, $N=13$, $p<0.01$) at baseline.

The study indicates that a number of schizophrenic patients may have reduced REM latency and decreased SWS, findings considered to typify sleep in endogenous depression. Since increased cholinergic activity is associated with decreased REM latency and reduced SWS, the association of these sleep abnormalities with negative symptoms in schizophrenia supports the implication of cholinergic excess in the pathophysiology of negative symptoms. Enlarged lateral and third ventricles were independently correlated with negative symptoms. While the precise implications of these findings are unclear, they suggest that increased cholinergic activity (sleep abnormalities) and cortical atrophy (ventricular enlargement) may be involved in the production of negative symptoms. The exact relationship between these putative mechanisms needs to be better understood.