Impaired Neuropsychological Performance in Euthymic Patients With Recurring Mood Disorders

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Background: Both patients suffering from schizophrenia and patients suffering from recurring mood disorder show cognitive impairments as established by a variety of neuropsychological tests. The aim of the present study was to investigate the neuropsychological performance of euthymic patients who had recurring mood disorder and the possible relationship between episodes of hospitalization and cognitive impairments.

Method: Twenty-six euthymic patients with a DSM-III-R recurring mood disorder diagnosis were investigated by using the Synonym Reasoning and Block-Test Battery and a part of the Halstead-Reitan Test Battery.

Results: An overall lowered performance in the test results was found. There was a significant positive relationship between four different tests and the number of hospitalization episodes; the patients with impaired cognitive functioning had significantly more hospitalization episodes than patients with normal cognitive functioning.

Conclusion: The results suggest that a subgroup of patients with recurring mood disorder are defined by more relapses and episodes of hospitalization and show cognitive dysfunctions even when euthymic.

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At the end of the last century it was thought that the characteristic separating affective psychosis from dementia praecox was that patients with the former tended to experience natural remission without cognitive dysfunctions, whereas patients with dementia praecox did not. However, with time it was realized that patients with bipolar disorder and other recurring mood disorders also can show cognitive impairments.[1–4] During the last decades, interest has been focused on investigating the possible differences in cognitive impairment between patients with schizophrenia and those with recurring mood disorder. In some studies, no significant difference was found between the patient groups,[5–7] while other investigators reported that either schizophrenic patients performed worse on cognitive measurements than bipolar and unipolar patients[8,9] or the opposite.[10] Since 1991 the majority of inpatients at the Department of Psychiatry at St. Göran's Hospital have been subjected to a neuropsychological test battery. As expected, patients with schizophrenic syndromes showed the most marked global cognitive impairments. However, patients with recurring mood disorder, in particular bipolar disorder, also showed impaired performance. During investigation of possible reasons for this dysfunction, a positive relationship between episodes of hospitalization and cognitive dysfunction in the bipolar disorder group was found. Other studies have suggested that the cognitive impairments found in bipolar disorder reflect dysfunctions in various brain areas when magnetic resonance imaging, single photon emission computed tomography, and positron emission tomography are used.[11–15] The results of these studies appear to indicate that the cognitive dysfunctions in bipolar disorder are state dependent. However, cognitive impairment has been found also in euthymic patients, thus suggesting a trait marker.[16,17]

The aims of the present study were to use a neuropsychological test battery to investigate patients with recurring mood disorder while they were euthymic and to test the possible relationship between cognitive impairment and episodes of hospitalization. The investigating procedures were approved by the Karolinska Hospital Ethical Committee.

MATERIAL AND METHOD

Patients

Twenty-six patients were chosen from the approximately 400 patients with recurring mood disorders

Table 1. Demographic Data of 26 Patients Diagnosed With Recurring Mood Disorders: Subclassified According to the Type of Episode that Led to Their Hospitalization

Characteristic	Manic Episodes	Both Manic and Depressive Episodes	Depressive Episodes
Patients, N	9	7	10
Male/Female, N	3/6	4/3	2/8
Age (y), mean ± SD	46 ± 11	48 ± 7	48 ± 19
Illness	Bipolar	Bipolar	Unipolar
Length of illness (y), mean ± SD	13.0 ± 8.5	18.0 ± 11.0	16.3 ± 12.1
Number of episodes of hospitalization, mean ± SD	6 ± 6	11 ± 9	3 ± 5
Range	1–19	1–26	1–15
Years of prophylactic medication, mean ± SD	8.3 ± 9.1	11 ± 5.0	7.8 ± 7.3
Medication at the time of testing[a]			
Neuroleptics	6	5	1
Antidepressants	1	2	5
Lithium	6	4	4
Carbamazepine	1	3	0
None	…	…	2

[a]At the time of testing, a patient could have been taking more than one drug.

treated at the Mood Disorder Clinic at the Department of Psychiatry, St. Göran's Hospital. The patients were chosen from the patient roster by a random procedure and categorized by the type of episodes for which they had been hospitalized, i.e., only manic episodes, both manic and depressive episodes, and only depressive episodes. Between 1991 and 1994, a neuropsychological test battery was administered to the patients while they were in a euthymic state. The patient demographic data are given in Table 1. The diagnoses were established according to the DSM-III-R criteria. Up to 6 weeks prior to the neuropsychological testing, mood and affect of the patients were assessed by the treating physicians who had had regular and long-standing contact with them (minimum of 5 years). Mood and affect were additionally assessed by the psychologist performing the neuropsychological testing. Only patients who were euthymic at the time of the investigation were included in the study. All patients had had a recent physical checkup. None of the patients included in the study showed signs or symptoms of neurologic disorder. None of the patients had been treated with electroconvulsive therapy within 6 months prior to the investigation.

Method

General intelligence was assessed by the Synonym, Reasoning, and Block-Test (SRB) Battery.[18] The Battery includes the Synonyms Test for assessing verbal understanding and the Reasoning Test, which is based on the Thurstone Figure Classification Test, and the Koh's Block Design Test, as a measure of visual-constructive skill. Memory function was assessed both by a Swedish

Table 2. Neuropsychological Test Results in 26 Patients With Recurring Mood Disorder*

	Recurring Mood Disorders Subclassification					
	Manic (N = 9)		Both Manic and Depressed (N = 7)		Depressed (N = 10)	
Neuropsychological Test	N	%	N	%	N	%
Synonym Reasoning and Block-Test Battery						
Synonyms Test (verbal understanding)	4	44	4	57	1	10
Reasoning test (visual-constructive)	2	22	3	43	3	30
Block-test (visuospatial)	6	67	5	71	5	50
General intelligence	3	33	5	71	3	30
Halstead-Reitan Test Battery						
Trailmaking A (scanning)	4	44	3	43	2	20
Trailmaking B (scanning and flexibility)	3	33	6	86	1	10
Finger Tapping (motor function/speed)	6	75[a]	2	33[a]	4	40
Rhythm Test (attention)	4	50[a]	3	50[a]	3	30
Claeson-Dahl						
Verbal Learning Test	6	67	3	43	3	30
Retention Test	1	13[a]	3	43	2	20
Memory for Designs	3	33	4	57	5	56[a]

*The patients have been subclassified according to the type of episode that led to their hospitalizations. The results are given as percentage of patients with significantly declined test results compared with the normal score in each given test.
[a]Percentages are based on a different total N: manic = 8, both manic and depressed = 6, depressed = 9.

version of the Schulze 10-Word Test (Claeson-Dahl Verbal Learning Test and Retention Test)[19] and by the Memory for Designs[20] for nonverbal memory. The following parts of the Halstead-Reitan Neuropsychology Battery[21] were performed: the Trailmaking Test for visuospatial scanning and flexibility; the Rhythm Test for nonverbal auditory perception, attention, and sustained concentration; and the Finger Tapping Test for assessing motor speed. The tests have reliability coefficients that range from 0.72 (Rhythm Test) to 0.95 (Synonyms Test). Age and education scaled non-normalized numeric T-scores (50 ± 10 = mean ± SD), based on the results of a random sample of 200 men and 200 women from the general population, were used as control material.[22] A high T-score indicates superior performance. Results below one standard deviation from the mean were considered to show signs of impairment.[22]

Statistical Method

Statistical significance was assessed by Student's t test, analysis of variance, analysis of log-likelihood, and chi-square test.

RESULTS

The neuropsychological test results are shown in Table 2. Although all patients were euthymic at the time of test-

ing, their overall performance was lower than the mean of the normal controls. This lowered performance was independent of the type of the episode that led to hospitalization. The only difference among the three subclassified groups was found in the Trailmaking B test, where significantly more patients were hospitalized with episodes of both depression and mania and a decline in T-scores ($p < .05$) compared with the depression only patients. Significantly more bipolar patients had impaired Synonym Test and Trailmaking B test results compared with patients with depression only ($p < .05$). Effects of age, gender, length of medication, length of illness, and number of hospitalization episodes on the individual neuropsychological test results of the total patient group were investigated. The number of hospitalization episodes was significantly correlated to four different tests: Reasoning ($p < .05$), general intelligence ($p < .01$), Trailmaking A ($p < .05$), and Trailmaking B ($p < .01$). In each of these tests, the patients with impaired cognitive functioning had significantly more hospitalization episodes (> 9) than the patients with normal cognitive function (< 5). Trailmaking A test results showed impairment to be positively correlated to the length of illness ($p < .01$).

DISCUSSION

The results of the present study show a remarkably lowered cognitive function in a substantial number of euthymic patients who have recurring mood disorder. These results are in concordance with an almost simultaneous study showing a variable pattern of cognitive impairment in 5 of 10 euthymic patients with recurring mood disorder.[23] The present investigation also suggests a relationship between the number of episodes of hospitalization and impaired cognitive functioning. An earlier study[6] did not find a relationship between impaired performance on neuropsychological tests and the number of relapses in bipolar patients. The mean ± SD number of relapses (1.8 ± 2.5) was, however, significantly smaller than in the present study. Additionally, the results of the present study show a relationship between the length of the illness and an impairment of the complex cognitive function of scanning. The size of the patient group was too small to investigate the possible influence of different prophylactic treatment strategies. However, the effects of antipsychotic medication, carbamazepine, or long-term lithium use on cognitive functions are generally thought to be small, although the effect of the medication cannot be definitely excluded.[24–30] The results of the present study suggest that the cognitive vulnerability is correlated to the number of hospitalizations and not to the polarity of recurring mood disorder. An episode of hospitalization is a good indicator of the severity of the relapse. Our results also suggest that a subgroup of patients with recurring mood disorder are defined by more relapses and episodes of hospitalizations and persistent cognitive dysfunctions when they are euthymic. The biological substrate(s) and the pathophysiologic mechanism(s) of these deficits are unknown. Further studies are necessary to correlate these neuropsychological findings to the data obtainable with modern imaging and other methods.[23]

Drug name: carbamazepine (Tegretol and others).

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