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Short report

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Cognitive deficits in hospitalized and never hospitalized remitted unipolar depressive patients

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ABSTRACT – *Background and Objectives*: Little is known about the differences between patients managing depression on an outpatient basis as compared with hospitalized ones. This study investigated the performance of attention, executive function and verbal memory during remission from unipolar depressive episodes and compare patients with and without history of hospitalization.

Methods: The sample of participants who had undergone one or more hospitalizations (hospitalized, N = 46) as well as in a sample without hospitalization (never hospitalized, N = 46) and controls (N = 92) were used. The Auditory Verbal Learning Test (AVLT) and the Trail Making Test (TMT) were administrated to test this hypothesis.

Results and conclusion: The hospitalized sample had similar results in all four neuropsychological variables in comparison with the never hospitalized group, and both groups had some lower results in comparison with controls. In comparison with the controls, hospitalized sample had mean cognitive deficits of 34% (28-41%), the never hospitalized group had a mean of 20% (21-35%). Contrary to previous reports we have found no meaningful differences between the two patient groups.

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Introduction

Major depression is a prevalent and disabling disorder with high rates of recurrence and chronicity[1-2]. Cognitive impairment is likely to be a key factor affecting the subject's ability to function occupationally[3-6]. The "therapeutic" aspects of mental hospitalization are generally taken for granted, and are usually considered to comprise protection, separation from a potentially pathogenic environment, and positive contact between patients and staff[7].

Kessing[8], who studied patients with primary affective disorders who had undergone hospitalization for depression, mania or a recurrent episode, and with no further admissions or with 2 more additional admissions, found that cognitive impairment appears to increase with the increasing number of episodes a patient has experienced. On the other hand, patients with a history of more than one hospitalization did not show any differences compared to patients experiencing their first hospitalization on most of the neuropsychological tests and clinical variables[9]. We might think that impaired cognitive performance in hospitalized patients relates to the fact that people with more severe symptomathology are hospitalized. The patients with a history of hospitalization had worse results than those without such a history[10-11]. Neuropsychological assessment is an ideal strategy for obtaining collaborative data in a psychiatric population due to the presumed absence of self-report bias[12]. We assumed that remitted patients who were previously hospitalized would demonstrate worse impairment of attention, memory and executive function in comparison to those remitted patients who had never been hospitalized.

Material and Methods

Sample

The study was conducted with 92 unipolar depressive outpatients (42 men and 50 women; Table 1 and 2). All the patients met the criteria for formerly having major depressive disorder according to ICD-10. All patients were in a remitted state at the time of testing. Remission was defined as a period of at least 2 months during which the subject functioned well (subjectively according to the patient and objectively according to their psychiatrist) and the MADRS on the day of study < 12. Patients were divided into two groups: never hospitalized (N = 46) or hospitalized (N = 46). Controls were recruited from the general population and they were matched for age, gender and education with the test groups (Table 1).

Individuals with mental retardation (IQ < 70 according to subtest Information from WAIS-R, scale score 6 and lower), dementia, substance abuse/dependence, neurological disorders or clinical/laboratory indications of a severe organic disease, actual or prior bipolar I or II were not counted. Written consent was obtained and the study was approved by the Ethical Regional Committee for Medicine of Prague Psychiatric Center.

Table 1
Family and occupational status in patient's group

	Hospitalized	%	Never hospitalized	%
Family status				
Single	6	13	11	24
Married	31	67	23	50
Divorced	7	15	10	22
Widow/er	2	4	2	4
Occupation				
Partially disabled	6	0	5	11
Partially disabled + employed	6	13	1	2
Unemployed	0	0	0	0
Maternity leave	1	2	2	4
Household	0	0	2	4
Student	1	2	3	7
Fully disabled	0	0	1	2
Old age pension	1	2	1	2
Entrepreneur	10	22	6	13
Employee	27	59	23	50
Rehabilitation	0	0	2	4

Methods

All subjects were given a battery of short neuropsychological tests (Table 3). Traditional neuropsychological criteria for cognitive impairment would identify those individuals who performed better than 1 SD below the healthy control mean as "unimpaired"[13-14].

Results

As can be seen in Table 2, groups were well matched. The number of hospitalizations was rather small in the hospitalized group (M = 1.9, SD = 1.0; maximum 5 hospitalizations). On average, hospitalized patients had been hospitalized 4 years prior (M = 4.2, SD = 3.9). The mean duration of illness was 17.8 years in the hospitalized group and 12.3 in never hospitalized group. The average age of the first depressive episode was 29.4 resp. 29.6 years. The mean number of depressive episodes was subjectively 2.9 vs. 2.4 and according to medical records 2.5 vs. 1.8.

Performance of both groups is presented in Table 4. Mean z-scores of patients and controls are seen in Table 5. In comparison with the controls, all mean z-scores for the depressive groups are lower. The hospitalized sample had cognitive deficits in the AVLT Trial (28%), in AVLT delayed recall (35%), in the

Table 2
Basic demographic and treatment details (means with SD in parentheses)

	Hospitalized (N = 46)	Never Hospitalized (N = 46)	Controls (N = 92)	p
Age	47.3 (10.4)	43.5 (13.0)	46.2 (12.0)	ns.
Education*	8.3 (2.2)	8.7 (2.1)	8.5 (2.1)	ns.
Gender (Male/Female)	25/21	17/29	45/50	ns.
BDI-II	11.8 (6.9)	11.3 (7.2)	6.3 (5.7)	< 0.001*
Information from WAIS-R	23.3 (0.3)	23.8 (0.3)	23.5 (0.2)	ns.
MADRS	4.3 (3.0)	4.5 (3.2)		ns.
Number of hospitalizations	1.9 (1.0)	0		ns.
Duration of illness (years)	17.8 (9.5)	12.3 (17.6)		ns.
Period since last hospitalization (years)	4.2 (3.9)	—		ns.
Age when first depressive episode	29.4 (9.7)	29.6 (13.7)		ns.
Number of depressive episodes (subjectively)	2.9 (1.5)	2.4 (1.0)		ns.
Number of depressive episodes (according to medical records)	2.5 (1.1)	1.8 (1.0)		.002
Psychiatric medication yes/no	38/8	32/10		ns.
Type of medication	TCA 30%	TCA 25%		
	SSRI 65% Mirtazepin 19% Other antidepresives 14%	SSRI 75% Mirtazepin 11% Other antidepresives 4%		

* Both depressive groups differ from controls.

** Education was based on 12-point scale.

Table 3
Neuropsychological screening battery

Memory
Auditory Verbal Learning test
The Auditory Verbal Learning test is a 15-word learning task which was repeatedly (5 times) read to the subjects. The sums of all the correctly recalled words from first five trials as well as the sum of words recalled in the delayed recall trials (after 30 minutes) were used as memory variables. The test was proved to be valid in other studies on depression and Czech validated version of the test was used.
Attention
Trail Making test (part A)
The Trail Making test, part A, is a valid and commonly used test to assess attention and psychomotor speed. Part A consists of encircled numbers from 1 to 25 randomly spread across a sheet of paper. The objective of the test is for the subject to connect the numbers 1-25 in sequence as fast as possible. Validated Czech version of the test was used.
Executive functions
Trail Making test (part B)
Part B is more complex than part A because it requires the subject to order numbers and letters in an alternating pattern (1-A-2-B-3-C, etc.) in the shortest possible time. The Trail Making test, part B, is a valid and commonly applied test to gage cognitive flexibility. In this test a connecting line is drawn as rapidly as possible for letters and numbers in an ascending sequence. The Trail Making Test, especially Trail B, is a good predictor of brain impairment. Validated Czech version of the test was used.

Table 4
Differences between patients and controls in neuropsychological tests (Mean, SDs, p-levels; compared ANOVA, Tukey HSD post hoc test)

	Hospitalized	Never hospitalized	Controls
AVLT Trial 1-5	52.8 (9.1)	52.6 (8.0)	55.3 (8.2)
AVLT delayed recall	10.2 (2.7)*	10.5 (2.9)*	11.2 (2.8)
Trail Making Test, part A	36.9 (11.2)9*	34.3 (12.4)	32.5 (9.9)
Trail Making test, part B	78.9 (24.3)	69.4 (26.2)	69.5 (26.1)

* Differ from controls ($p < .01$).

Table 5
Z-scores for both patients groups

	Hospitalized		Never hospitalized	
	Mean z- score	SD	Mean z-score	SD
AVLT 1-5	-0.30	1.10	-0.33	0.97
AVLT delayed recall	-0.59	0.84	-0.52	0.98
Trail Making test, part A	-0.86	1.20	-0.38	1.37
Trail Making test, part B	-0.39	0.82	-0.07	0.98

Trail Making Test, part A (41%), and in Trail Making test, part B (30%). The never hospitalized sample demonstrated signs of cognitive deficit in the AVLT Trial (33%), in the AVLT delayed recall (35%), in the Trail Making Test, part A (22%), and in the Trail Making test, part B (21%). In total, 34% of the hospitalized sample had cognitive deficits, and 20% of the never hospitalized sample presented the same deficiencies ($p = 0.134$).

Discussion

The hospitalized sample did not have worse results in any from 4 neuropsychological tests compared to the never hospitalized sample. The only statistically significant difference in comparison with controls was in the Trail Making test, part A, with worse performance found in the hospitalized sample and in AVLT delayed recall for both depressive samples.

Both depressive samples had significantly higher levels of subjective depressiveness according to the BDI-II in comparison with controls. These results may suggest that certain residual depressive symptomatology may affect performance in neuropsychological tests. This may be true despite the fact that no relationship between neuropsychological tests and BDI-II/MADRS was proven, besides the correlation between the MADRS and TMT-B scores ($r = -0.33$, $p = 0.001$).

In our data, we did not find a relationship between the number of hospitalizations and the subjectively reported depressive episodes as well as cognitive performance for separate groups, but for the whole sample of depressive patients this link was found ($r = -0.27$, $p = 0.008$ and -0.33, $p = 0.003$). Some negative effects of repeated depressive episodes were found in one of the four neuropsychological measures. These findings are and have been considered controversial in older studies[15]. Other studies and papers have also failed to find differences between first and recurrent episodes[16].

The performance of both depressive groups is below the mean scores of the controls, but does not exceed 66% in the hospitalized sample and 80% in the never hospitalized sample, -1 SD below the mean of controls. Level of cognitive deficits varied in hospitalized sample from 28-41% and in never hospitalized from 21-35%. According to Gauss curve, in this range should be about 15.86% patients.

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