

Evaluating feasibility and satisfaction of a group intervention for mild cognitive impairment in older age bipolar disorder: “Brain train”

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1 | INTRODUCTION

Patients with older age bipolar disorder (OABD), defined as bipolar disorder (BD) in people aged over 50 years, often exhibit greater cognitive impairment compared with healthy peers, even between mood episodes.¹ In addition, lower global cognitive functioning has been associated with impairments in social functioning.² In the general population of older adults, as well as in patients with mild cognitive impairment or early-stage dementia, interventions aimed at stimulating physical exercise or cognitive training were effective in improving cognitive functioning. Similar positive effects were found in younger patients with BD (recent systematic review:³), but these strategies are not yet available or tested for efficacy in OABD. Additionally, most cognitive remediation programs for bipolar disorder enroll patients with subjective cognitive complaints. However, objective cognitive impairment is not always accompanied or even preceded by subjective cognitive complaints. Thus, subjective cognitive complaints may not be the best inclusion criterion for cognitive remediation aimed at reducing future cognitive decline. Furthermore, it is difficult for patients to reliably report about their cognitive functioning, and OABD patients have been shown to overestimate their cognitive performances. For this pilot study, we used some degree of impaired objective cognitive and social functioning as inclusion criteria and target for treatment.

2 | INTERVENTION

By combining cognitive remediation with moderately intensive physical exercise and social encounter with peers, we aimed to attract a majority of patients. This pilot study of “Braintrain” was conducted with the primary objective to evaluate the feasibility and patient satisfaction. The secondary objectives were to measure possible beneficial effects on cognitive functioning, physical strength, social participation, and mood symptoms. After having attained ethical approval by the institutional review board of the VU University Medical Center, Amsterdam, patients were enrolled from our observational dynamic cohort study (Dutch Older Bipolars: DOBi), in a period of 2 years (2017–2018). Patients were included according to the following criteria: (1) aged 50 years and over with a DSM-5 bipolar disorder type I or II diagnosis confirmed by MINI interview; (2) partially remitted or euthymic mood defined as CES-D < 16 (Center for Epidemiologic Studies Depression Scale [CES-D]) and YMRS < 12 (Young Mania Rating Scale) allowing some degree of subclinical mood symptoms; (3) cognitive impairment of at least -1.0 SD in one or more cognitive domains at the neuropsychological examination; (4) Social and Occupational Functioning Assessment Scale (SOFAS) < 60 to ensure some degree of social impairment; and (5) self-reported ability to walk at least 30 min.

The cognitive remediation program consisted of 12 weekly group sessions each lasting one and a half hours and was based on the

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functional remediation program from the Barcelona group⁴ of which parts had been translated into Dutch and tested to be efficient⁵. The group made a walk in the forest twice a week (1 h and 1.5 h, respectively) to stimulate physical exercise in an enriched environment and foster social encounters.

We planned to enroll two groups of 15 patients each with follow-up measurements up to 3 months after the intervention.

3 | RESULTS

The intervention was offered three times (fall 2017, $n = 6$; spring 2018, $n = 6$; spring 2019, $n = 6$) and a total of 18 patients were included out of 80 outpatients from the DOBi cohort. Demographic and clinical characteristics at baseline, posttreatment, and follow-up are summarized in Table 1. The mean age was 65 (SD 7.6) and 55% were females.

Five patients could not finish the program due to various reasons (too burdensome $n = 2$, personal circumstances $n = 1$, or mood instability $n = 2$). One patient suffered from a stroke during follow-up and dropped out.

Participants were not allowed to miss more than three sessions. Most patients succeeded in doing their weekly homework, although for some it was difficult. Homework adherence was influenced by planning skills and motivation. Patients who completed the program ($n = 13$, 72%), were satisfied with the content of the intervention and evaluated its usefulness as positive. The social aspect of the program was appreciated most. Some participants remarked that they would have appreciated larger groups with a balanced distribution of gender.

4 | DISCUSSION

A combination of cognitive remediation, moderately intense physical exercise, and social encounters with peers, as in "Braintrain," may be a promising treatment option for patients with BD. The program was feasible; most patients completed the program and could follow all the sessions. Dropout was mainly due to personal circumstances. Patients were highly satisfied, especially the social aspect was appreciated.

Inclusion was challenging because patients who fulfill these criteria of cognitive and social impairment often have more physical problems and a less stable mood. As a consequence, a large number of the patients who were eligible for the pilot study did not fulfill the criterion for physical exercise (i.e., be able to walk at least half an hour) and several patients (3 of 18; 17%) had to stop the program because of an increase of mood symptoms.

When using more flexible including criteria for physical exercise, more patients would be able to enroll in such a program. It is assumed that one needs to be at least moderately active for cognitive benefit, but proper adjustments could be made. For instance, the introduction of aerobic exercises instead of walking

Key Message

To date, no remediation treatment is available aimed at improving cognitive functioning in patients with older age bipolar disorder (OABD). Our pilot intervention (Brain train) included cognitive training, physical exercise, and social encounter with peers for OABD and was positively evaluated by the participants. However, its feasibility was limited as few patients fulfilled the inclusion criteria of cognitive and social impairment and retaining the physical ability to walk for a minimum of 30 min. OABD patients with cognitive impairment are a vulnerable group for which it is most challenging to design interventions aimed at improving daily functioning.

LEARNING POINTS

- An intervention aimed at improving objective cognitive and social functioning in OABD that includes exercise is difficult as many patients suffer from an additional poor physical condition.
- To ensure personalized care for patients a greater variability and flexibility in physical interventions are needed.

and the option to follow parts of the exercise program at home at the cost of diminishing the social aspect of the study. Perhaps, the most effective way to deliver exercise programs is an individually supervised format preferably in a group setting, although the social aspect of Braintrain was most appreciated. With these adjustments, future research can target a larger group of patients and thus be better able to focus on the effects on cognition and social functioning according to clinical recommendations for trial design by the Targeting Cognition Task Force of the International Society for Bipolar Disorders (ISBD).

Many cognitive remediation programs enroll patients with subjective cognitive complaints, even though they aim at improving both subjective experience and objective cognitive functioning.

"Brain train" is intended to target objective cognitive impairment. Although participating patients were enthusiastic, many patients could not be included. Our goal to include OABD patients with some degree of cognitive and social impairment was too ambitious as many could not participate in the physical exercise due to comorbid physical problems.

TABLE 1 Demographic and clinical characteristics (N = 18)

	Baseline (n = 18)	Post treatment (n = 13)	Follow-up (n = 12)
	M (SD)	M (SD)	M (SD)
Demographic variables			
Age (years)	65.3 (7.6)	—	—
Female (%)	55	—	—
Education	5.3 (1.4)	—	—
Partner, yes (%)	68.4	—	—
Clinical variables			
BD-type II (%)	58.8	—	—
Duration of disease, years	34.5 (17.5)	—	—
Age of onset	32.0 (16.1)	—	—
Early onset, yes (%)	78.9	—	—
Number of admissions	1.6 (1.2)	—	—
Number of episodes	42.3 (22.7)	—	—
Number of somatic diseases	2.1 (1.5)	—	—
Smoking, yes (%)	15.8	—	—
Lithium use, yes (%)	64.7	—	—
MMSE	28.6 (1.7)	—	28.6 (2.3)
YMRS	1.6 (2.5)	2.1 (3.4)	2.1 (2.2)
CES-D	18.0 (8.8)	14.5 (7.5)	14.8 (8.4)
FAST-O	20.7 (11.7)	19.7 (9.8)	18.1 (8.5)
Walking speed	6.1 (1.1)	6.4 (1.8)	—
Grip strength	25.8 (9.0)	29.0 (8.5)	—

Educational level was assessed by a Dutch scoring system consisting of a 7-point scale, ranging from unfinished primary education (Level 1) to university education (Level 7).

Abbreviations: CES-D, Center for Epidemiologic Studies Depression Scale; FAST, Functional Assessment Staging; MMSE, Mini-Mental State Examination; YMRS, Young Mania Rating Scale.


CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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