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Neuropsychological rehabilitation has beneficial effects on perceived cognitive deficits in multiple sclerosis during nine-month follow-up

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ABSTRACT

Background: Systematic reviews have indicated a low level of evidence for the positive effects of neuropsychological and cognitive rehabilitation in multiple sclerosis (MS). How permanent the positive effects are, is unknown.
Objective: The aim of the present study was to evaluate whether short-term neuropsychological rehabilitation has long-term beneficial effects in a nine-month follow-up.
Methods: 102 relapsing–remitting MS patients with subjective and objective attentional deficits were randomized into intervention and control groups. Altogether 78 out of 102 patients (76%) completed the longitudinal follow-up (intervention group 83%, control group 67%). Intervention group received strategy-oriented neuropsychological rehabilitation conducted once a week in 60-minute sessions during thirteen consecutive weeks. The control group received no intervention. Cognitive deficits, mood, fatigue, impact of disease, and quality of life were evaluated with self-reports at baseline, six months, and one year from baseline.
Results: The positive effects of neuropsychological rehabilitation on perceived cognitive deficits were maintained for nine months. Among a subgroup of patients with moderate to severe attentional deficits, positive rehabilitation outcome was even more evident.
Conclusion: The beneficial effects of strategy-oriented neuropsychological rehabilitation on perceived cognitive deficits in MS may be maintained for at least one year after the beginning of the intervention.

1. Introduction

Cognitive dysfunction is a common manifestation among patients with multiple sclerosis (MS) occurring in about 50–60% of patients and having widespread effects on patients' quality of life [1,2]. Cognitive functions most often affected are speed of information-processing, memory, executive skills and complex attention [1,2]. Typically MS-related cognitive deficits are specific and relatively mild. Symptoms of mood and fatigue are also common among MS patients and may aggravate cognitive problems [3]. Longitudinal studies covering a few years (one to four years) have mainly failed to show significant cognitive decline; instead, after longer follow-up times (10 or more years), cognitive impairment often emerges and progresses [2].

No effective pharmacological treatment has been established for cognitive dysfunction in MS to date [4]. The cognitive profile with mild and limited deficits makes MS patients particularly appropriate for interventions targeting specific cognitive functions, such as memory or attention [5]. On the other hand, the progressive nature of MS-related cognitive deficits increases the challenges to the interventions. Systematic reviews indicate a low level of evidence for the positive effects of neuropsychological and cognitive rehabilitation in MS [6–8].

Problems with attention and information processing speed are among the most common cognitive symptoms in MS. Retraining of attention and memory has been shown to improve cognitive performance in quasi-randomized [9] and clinically controlled [10] study settings, reduce fatigue in quasi-randomized study [9], and alleviate depressive symptoms in clinically controlled study [10]. Cognitive retraining combined with neuropsychological counseling and teaching compensatory strategies has also been found to improve cognitive performance in quasi-randomized [11] and randomized clinical trials (RCT) [12], alleviate depressive symptoms [11] and reduce fatigue symptoms [13] in quasi-randomized study setting as well as increase the use of compensatory strategies in RCT study setting [12]. While neuropsychological rehabilitation has shown promise in MS, it is unclear how long the positive effects can be maintained.

The results of our previous study indicate that short-term strategy-oriented neuropsychological rehabilitation of attention has a significant positive effect on MS patients' perceived cognitive deficits [14]. The

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aims of the present study were to evaluate whether the positive effects are maintained in a nine-month follow-up, and to examine whether the severity of attentional deficits at baseline affects the long-term outcome.

2. Materials and methods

2.1. Patients

Complete details of the study procedure, the patients included, the intervention, and the outcome measures employed are described in our previous publication [14]. Briefly, a total of 102 patients with clinically definite [15] relapsing–remitting multiple sclerosis (MS) from three different study centers were included in the study. The inclusion criteria were clinically definite relapsing–remitting MS, the Expanded Disability Status Scale (EDSS [16]) < 6, subjective deficits in attention (the total score of questions 1, 2, and 11 in the Multiple Sclerosis Neuropsychological Questionnaire — Patient, MSNQ-P [17] ≥ 6), objective deficits in attention (Symbol Digit Modalities Test, SDMT [18] total score ≤ 50 (1 SD under the Finnish norms of healthy controls)), and age 18–59. Patients with a history of drug or alcohol abuse, psychiatric disorder, acute relapses, neurological disease other than MS, or ongoing neuropsychological rehabilitation were excluded. To verify the information obtained from the patients

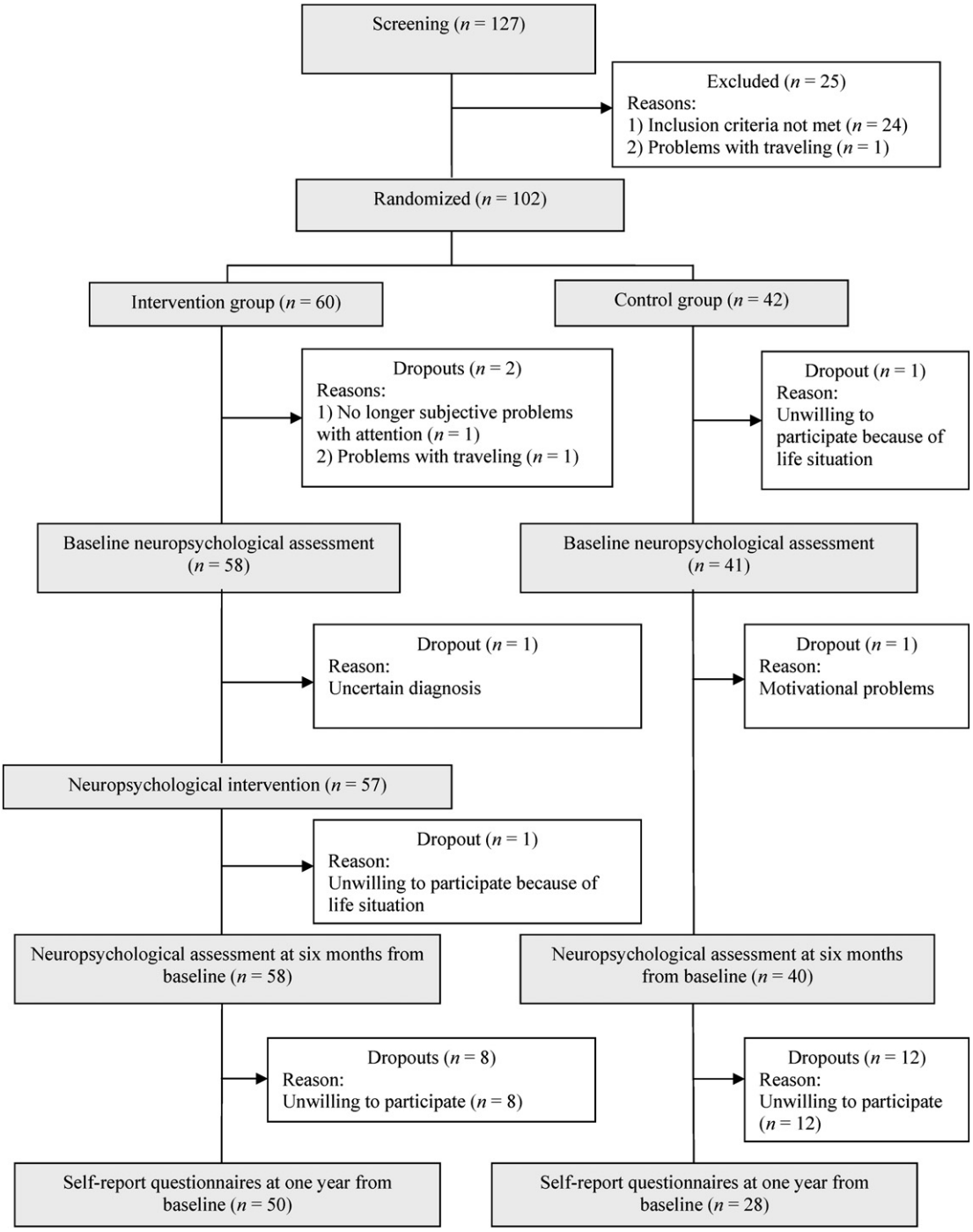

Fig. 1. Flow chart of the study participation.