Journal of the Neurological Sciences 338 (2014) 156–161

Contents lists available at ScienceDirect

Journal of the Neurological Sciences

journal homepage: www.elsevier.com/locate/jns

Predictors and impact of the working alliance in the neuropsychological rehabilitation of patients with multiple sclerosis

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ARTICLE INFO

Article history:
Received 13 September 2013
Received in revised form 22 November 2013
Accepted 24 December 2013
Available online 3 January 2014

Keywords:
Alliance
Multiple sclerosis
MS
Neuropsychological rehabilitation
Outcome
Working alliance

ABSTRACT

Background: There is preliminary evidence of positive effects of neuropsychological rehabilitation in multiple sclerosis (MS). However, whether a working alliance affects rehabilitation outcome has not been studied.
Objective: The aim of this study was to evaluate the effects of the baseline patient-related (cognitive, mood and fatigue symptoms, cognitive status, demographic factors) and illness-related factors (duration and severity of the disease) on the alliance, as well as the effects of the alliance on rehabilitation outcome in neuropsychological rehabilitation among MS patients.
Methods: Fifty-six patients with relapsing–remitting MS received multimodal neuropsychological intervention (attention retraining, learning strategies, psychoeducation, psychological support, homework assignments) conducted once a week in 60-minute sessions for thirteen consecutive weeks. After the intervention, both patients and therapists evaluated the alliance with the short form of the Working Alliance Inventory.
Results: None of the baseline factors was related to the alliance. Better patient-evaluated alliance was associated with a more prominent decrease in fatigue symptoms and greater achievement of rehabilitation goals. Better therapist-evaluated alliance was associated with greater benefit from the intervention as evaluated by therapists.
Conclusion: A positive patient–therapist alliance may relate to positive neuropsychological rehabilitation outcome in MS.

1. Introduction

The concept of a working alliance (referred to later in the text as the alliance) is rooted in psychotherapy and has been studied extensively in that field, showing that alliance in psychotherapy is a critical therapeutic element for a desirable outcome [1]. The most commonly used definition for alliance is that of Bordin [2]: The working alliance is the combination of 1) client and therapist agreement on goals; 2) client and therapist agreement on the utility and efficacy of the things done in rehabilitation; and 3) the development of a personal bond between the participants. Horvath and Greenberg [3] developed the Working Alliance Inventory (WAI) with the purpose of measuring Bordin's three factors. Since then it has become the most widely used measure of alliance and as such its reliability and validity have been repeatedly established [3,4].

It has been shown that a positive alliance is associated with positive outcomes in psychotherapeutic interventions for variables such as mood, anxiety, interpersonal problems, and general psychological functioning. Over the past few decades, meta-analytic overviews have reported moderate but robust alliance–outcome correlations [4,5]. A good working alliance has also been found to relate to positive outcome in the chronic care of psychiatric patients [6] and in physical rehabilitation [7].

Cognitive dysfunction is a common manifestation among patients with multiple sclerosis (MS) occurring in about 50–60% of patients and having widespread effects on quality of life [8,9]. Cognitive functions most affected are speed of information-processing, memory, executive skills and complex attention [8,9]. Depression and fatigue are also common in MS and may aggravate cognitive symptoms [8,9]. According to systematic reviews, there is preliminary evidence of positive effects of neuropsychological rehabilitation in MS [10,11]. However, the factors contributing to rehabilitation outcome are not well known and additional research is called for to investigate the factors that influence the effectiveness of the rehabilitation [12].

The role of the alliance in neuropsychological rehabilitation has not been widely studied. Previous findings on traumatic brain injury patients show a positive relationship between alliance and employment/productivity status [13,14], metacognitive skills [15], reduction of depressive symptoms [16], patient's experience of success [16], and driving clearance and ability [17]. In MS, a positive alliance has been found to predict reduction in depressive symptoms after cognitive–behavioural-

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http://dx.doi.org/10.1016/j.jns.2013.12.039

therapy [18] but, to our knowledge, the significance of an alliance in neuropsychological rehabilitation in MS has not been studied. The aims of our study were twofold. Firstly, we evaluated whether patient-related baseline factors (cognitive, mood or fatigue symptoms, cognitive status or demographic factors) or illness-related factors (duration or severity of the disease) have an effect on the alliance in neuropsychological rehabilitation in MS. Secondly, we evaluated the effects of the patient–therapist alliance on rehabilitation 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 [19]. Briefly, a total of 102 patients with clinically definite [20] relapsing–remitting MS were included in the study. The inclusion criteria were clinically definite relapsing–remitting MS, the Expanded Disability Status Scale (EDSS [21] < 6), subjective deficits in attention (total score of questions 1, 2, and 11 in Multiple Sclerosis Neuropsychological Questionnaire-Patient, MSNQ-P [22] ≥ 6), objective deficits in information processing speed (Symbol Digit Modalities Test, SDMT [23] total score ≤ 50), and ages 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. All patients provided written informed consent, and the study protocol was approved by the Ethics Committee of Seinäjoki Central Hospital, Tampere University Hospital and Turku University Hospital.

Patients were randomised into an intervention and a control group using a computer-generated random number table and stratified randomisation according to age (18–37 vs. 38–58 years), gender (female vs. male), years of education (<12 vs. ≥12 years), disability (EDSS 0–4 vs. 4.5–5.5), and study centre, in the ratio 3:2 (intervention:control) by an independent statistician. Of the 102 randomised patients, 98 (intervention group 58, control group 40) completed the whole study. In the present study, we were interested in the working alliance between therapist and patient and, therefore, the study sample was solely the intervention group. Because of two drop-outs not fulfilling the alliance evaluations, the number of included patients was 56 (Table 1).

2.2. Intervention

All patients in the intervention group received outpatient neuropsychological rehabilitation conducted once a week in 60-minute sessions for thirteen consecutive weeks. Patients were instructed to avoid other neuropsychological interventions during the study. None of the patients received neuropsychological rehabilitation, some patients received out-patient physiotherapy or an in-patient rehabilitation period. 95.5% of the intervention appointments were realised as planned. The rehabilitation consisted of a computer-based attention and working memory retraining, learning compensatory strategies, psychoeducation, and homework assignments connected with rehabilitation goals, as well as psychological support to promote coping with cognitive impairments. The rehabilitation neuropsychologists ($n = 3$) were not the same as the assessing neuropsychologists ($n = 3$). The assessing neuropsychologists were blind to group membership. After the last neuropsychological assessment, the assessing neuropsychologists' estimate of patients' group membership (intervention or control) was correct in 62% of the cases. At the beginning of the intervention, patients set goals for the rehabilitation together with the neuropsychologist using the Goal Attainment Scaling (GAS) [24]. Every patient was asked to set one to three goals concerning attentional problems they faced in everyday life.

Table 1
Demographic, clinical and behavioural characteristics of the study population at baseline ($n = 56$).

Descriptive variables	Mean	SD	Range
Demographics			
Age in years	43.7	8.8	22–58
Sex, female/male	43/13		
Education in years	13.5	2.3	8–18
Clinical			
EDSS, n/%			
0–4	52/92.9		
4.5–5.5	4/7.1		
Duration since MS diagnosis in years	9.3	6.7	1–32
Cognition			
Verbal memory (Z-score)	−1.7	2.1	−6.7 to 1.4
Visual memory (Z-score)	−0.02	1.0	−2.3 to 1.5
Attention-executive functions (Z-score)	−1.1	1.0	−3.6 to 0.8
Fluency (Z-score)	0.6	2.0	−2.7 to 5.9
Self-reported symptoms/deficits			
PDQ, total score	36.3	12.0	9–65
BDI-II, total score	12.9	7.2	0–29
MSIS-psychological, subscale score	31.5	20.0	0–81
FSMC, total score	64.7	18.0	25–98
FSMC-cognitive, subscale score	32.7	9.0	12–49

EDSS = Expanded Disability Status Scale; PDQ = Perceived Deficits Questionnaire; BDI-II = Beck Depression Inventory II; MSIS-psychological = Multiple Sclerosis Impact Scale—psychological composite; FSMC = Fatigue Scale for Motor and Cognitive Fatigue.

2.3. Outcome measures

Fig. 1 illustrates the research design. The blinded neuropsychologists performed neuropsychological assessments at baseline, after three months (end of intervention) and after six months. The cognitive performance was evaluated with the Brief Repeatable Battery of Neuropsychological Tests (BRBNT), a widely used brief neuropsychological battery with reasonable availability and acceptable sensitivity in MS [25,26]. The BRBNT includes: the Buschke Selective Reminding Test (BSRT) to assess verbal memory; the 10/36 Spatial Recall Test (10/36) to assess visual memory; the Symbol Digit Modalities Test (SDMT) to assess information processing speed and executive functions; the Paced Auditory Serial Addition Test 2 and 3 seconds (PASAT 2–3) to assess attention, information processing speed, and working memory; and the Controlled Oral Word Association Test (COWAT) to assess semantic fluency.

The self-perceived cognitive deficits were evaluated with the Perceived Deficits Questionnaire (PDQ) [27], the self-perceived depressive symptoms with the Beck Depression Inventory II (BDI-II) [28], the psychological impact of the disease with the Multiple Sclerosis Impact Scale (MSIS-29) [29], the self-perceived feelings of fatigue with the Fatigue Scale for Motor and Cognitive Fatigue (FSMC) [30], and achievement of personal rehabilitation goals with the Goal Attainment Scaling (GAS) [24]. Previous studies provide good evidence for the reliability and validity of the methods used, like the PDQ [31], the MSIS-29 [32], the FSMC [30], and the GAS [33].

At the end of the intervention, before the last neuropsychological assessment, the working alliance was evaluated separately and independently by the patient and the therapist with the short form of the Working Alliance Inventory (WAI) [3,34]. In addition to the general alliance factor (total score), the task factor (patient–therapist agreement on the utility and efficacy of the things done in rehabilitation; questions 2, 4, 24, 35), the bond factor (personal bond between patient and therapist; questions 8, 21, 23, 26), and the goal factor (patient–therapist agreement on goals; questions 12, 22, 27, 32) were analysed according to Tracey and Kokotovic [34]. The maximum total score in WAI was 84. Furthermore, after the intervention, before knowing the results of the neuropsychological assessment, the therapists evaluated the benefit patients had received from the intervention using a four-point scale: 1) not at all, 2) to some extent, 3) moderately, and 4) obviously.