Schizophrenia Research xxx (2013) xxx–xxx

Contents lists available at ScienceDirect

Schizophrenia Research

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

Neurocognitive individualized training versus social skills individualized training: A randomized trial in patients with schizophrenia

Paola Bucci [a], Giuseppe Piegari [a], Armida Mucci [a], Eleonora Merlotti [a], Marcello Chieffi [a], Francesco De Riso [a], Maria De Angelis [b], Walter Di Munzio [b], Silvana Galderisi [a,*]

[a] Department of Psychiatry, University of Naples SUN, Italy
[b] Mental Health Department, Salerno, Italy

ARTICLE INFO

Article history:
Received 5 April 2013
Received in revised form 12 July 2013
Accepted 29 July 2013
Available online xxxx

Keywords:
Cognitive training
Social skills training
Individualized interventions
Real-world functioning

ABSTRACT

Rehabilitation programs integrating cognitive remediation (CR) and psychosocial rehabilitation are often implemented as they seem to yield greater improvements in functional outcome than stand alone treatment approaches. Mechanisms underlying synergistic effects of combining CR with psychosocial interventions are not fully understood. Disentangling the relative contribution of each component of integrated programs might improve understanding of underlying mechanisms. In the present study we compared the efficacy of two components of our rehabilitation program [the Neurocognitive Individualized Training (NIT) and the Social Skills Individualized Training (SSIT)].

Seventy-two patients with schizophrenia or schizoaffective disorder were randomly assigned to one of two treatment groups. Changes in cognitive, psychopathological and real-world functioning indices after 6 and 12 months were compared between the two groups.

After both 6 and 12 months, NIT produced an improvement of attention, verbal memory and perseverative aspects of executive functioning, while SSIT produced a worsening of visuo-spatial memory and attention and no significant effect on the other cognitive domains. As to the real-world functioning, NIT produced a significant improvement of interpersonal relationships, while SSIT yielded a significant improvement of QLS instrumental role subscale.

According to our findings, cognitive training is more effective than social skills training on several cognitive domains and indices of real-world functioning relevant to subject's relationships with other people. Integrated approaches might target different areas of functional impairment but should be planned carefully and individually to fully exploit the synergistic potential.

1. Introduction

In people with schizophrenia relationships between cognitive impairment (CI) and poor psychosocial functioning have been increasingly acknowledged (Harvey et al., 1998; Green et al., 2000, 2004; Bowie and Harvey, 2006).

So far, no conclusive data have been produced on the effectiveness of pharmacological treatments of CI: in several studies atypical antipsychotics were found to produce a mild cognitive remediation with respect to typical antipsychotics (Bilder et al., 2002; Harvey et al., 2003; Woodward et al., 2005, 2007), while others found small or no significant difference with respect to typical antipsychotics (Keefe et al., 2004; Mishara and Goldberg, 2004; Davidson et al., 2009); several recent studies investigating the effects of cognitive enhancer compounds as an adjunctive therapy to antipsychotics, although reporting some promising results, did not yet produce sufficient evidence to recommend their use (Buchanan et al., 2011; Harvey and Bowie, 2012).

Evidence has been provided that cognitive remediation (CR) interventions improve both cognition and real-world functioning, with a small-to-moderate effect size (Wykes et al., 2011).

Impairment of social abilities also has significant impact on psychosocial functioning and has been addressed by a variety of psychosocial interventions whose effectiveness is supported by a substantial body of evidence (Kurtz and Mueser, 2008). Programs integrating CR and psychosocial interventions have also been evaluated. Our group reported that a rehabilitation program combining individualized cognitive and social skills training produces greater impact on patients' functioning than structured leisure activities (Galderisi et al., 2010). Greater cognitive and functional changes were reported for programs integrating CR training and psychosocial treatments than for either intervention alone (Hogarty et al., 2004; McGurk et al., 2007; Wykes et al., 2011). Mechanisms underlying synergistic effects of combining CR with psychosocial interventions are not fully understood. It has been suggested that the opportunity provided by other psychosocial interventions to practice

* Corresponding author. Tel.: +39 0815666504.
E-mail address: silvana.galderisi@gmail.com (S. Galderisi).

0920-9964/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.schres.2013.07.053

and therefore boost improvements obtained with CR explain the observed advantages (Wykes et al., 2011; Medalia and Saperstein, 2013). The possibility might also be envisaged that social and neurocognitive abilities have a biunivocal relationship, such that deficits in neurocognition affect subject's abilities in social life and vice versa, i.e. high levels of social anxiety and discomfort related to poor social abilities may affect neurocognitive abilities. As a matter of fact, significant associations between specific cognitive deficits and role play performance (Addington and Addington, 1999; McClure et al., 2007), as well as community functioning (Bowie et al., 2006; Cohen et al., 2006; Bowie et al., 2008), have been found, and evidence has been provided that neurocognition can be significantly improved by psychosocial rehabilitative interventions that are not specifically designed to change cognition. Few studies, so far, tried to disentangle the relative contribution of each component of integrated programs, which might also foster better understanding of underlying mechanisms (Horan et al., 2011; Bowie et al., 2012) and inform us about the possibility of implementing individualized programs in which one of the components represents the main or the only treatment. For CR programs this is particularly important, as their validity as successful interventions strongly depends on the impact they demonstrate on everyday functioning and/or quality of life, in addition to their ability to improve CI.

In the present study we compared the benefit to cognitive performance and real-world functioning of each component of our rehabilitation program [the Neurocognitive Individualized Training (NIT) and the Social Skills Individualized Training (SSIT)] in two groups of individuals with schizophrenia or schizoaffective disorder living in the community.

2. Methods

2.1. Subjects

Subjects were recruited among patients attending the outpatient units of 5 sites: the Department of Psychiatry of the University of Naples SUN and 4 mental health centers of the Department of Mental Health of Salerno. The study was coordinated and supervised by the Department of Psychiatry of the University of Naples SUN. The study was approved by the Ethics Committee of both Departments.

All subjects with a diagnosis of schizophrenia or schizoaffective disorder and an age between 18 and 60 years were invited to participate. Inclusion criteria, besides the age range, were (a) a diagnosis of schizophrenia or schizoaffective disorder confirmed by the Mini International Neuropsychiatric Interview Plus (MINI Plus); (b) no hospitalization or symptom exacerbation or changes in medication in the last 3 months; (c) a minimum of 5 years of education; (d) no medical or neurological or developmental illness involving severe and/or long lasting disability; (e) no alcohol or drug abuse; (f) willingness to participate in the study expressed by signing a written informed consent after a detailed presentation of all procedures.

2.2. Study design

All recruited patients were randomly assigned to either the Neurocognitive Individualized Training (NIT) or to the Social Skills Individualized Training (SSIT). Randomization was independent of the study team. Assessments of psychopathological, cognitive, and real-world functioning were performed at baseline (T0), and repeated at two time intervals: (a) after six months of rehabilitation intervention (T6); (b) 6 months (T12) after the end of the rehabilitation intervention, and during which patients were treated as usual in normal daily practice, to verify the persistence of eventually observed effects of rehabilitation.

Patients were considered drop-out when: 1) they did not participate in the rehabilitative program for four consecutive weeks; 2) during the intervention they showed a severe psychopathological worsening for which they needed hospitalization and/or a change of treatment.

Patients who dropped from the study before completing at least 1 month of the program did not participate in post-treatment assessment and were excluded from statistical analyses.

2.3. Real-world functioning, psychopathology and neurocognitive assessments

The Quality of Life Scale (QLS; Heinrichs et al., 1984) was used to assess real-world functioning. It is a rater-administered scale including 21 items rated from 0 to 6 (with higher scores reflecting better functioning) that yields measures on four subscales that address: interpersonal relationships, instrumental role, intrapsychic foundations, and use of objects and participation in activities.

Psychopathological evaluation was carried out by means of the Positive and Negative Syndrome Scale (PANSS, Kay et al., 1987). Ratings on PANSS items were combined to calculate three dimensions of schizophrenia symptomatology: psychomotor poverty, reality distortion and disorganization, according to the method derived by Harris et al. (1999). Items summed to calculate each dimension include: 1) blunted affect, emotional withdrawal, social withdrawal, poor rapport and lack of spontaneity for Psychomotor Poverty; 2) conceptual disorganization, grandiosity, excitement and lack of abstract thinking for Disorganization; and 3) suspiciousness, delusions, hostility and hallucinatory behavior for Reality Distortion.

As to neurocognitive assessment, four cognitive domains were evaluated: (a) attention, assessed by the number of omission and commission errors of the Continuous Performance Test-AX (CPT-AX; Rutschmann et al., 1977); (b) memory, evaluated by means of the number of delayed recalls on the WHO Auditory Verbal Learning Task (AVLT; Maj et al., 1993) and the number of correct identifications on the WHO Picture Memory and Interference Test (PMIT; Maj et al., 1993); (c) executive functions, evaluated by the number of perseverative errors on the Wisconsin Card Sorting Test (WCST; Heaton et al., 1993), by the number of interferences on the Picture Memory and Interference Test and by the index of cognitive flexibility of the Trail Making test (part B minus the part A time) (TMT; Reitan and Wolfson, 1993); and (d) Verbal Fluency, assessed by the number of correct words on the Category Instances (CI; Benton and Hamsher, 1978).

Real-world functioning, psychopathology and neurocognitive assessments were carried out by psychiatrists or trainees in Psychiatry from the University Department of Psychiatry, trained in the use of the instruments, who were blind to the group assignment and not involved in either SSANIT or SLA treatment. The same assessor completed all the evaluations relevant to one and only one area, to avoid halo effects and inter-rater discrepancies. Patients were told not to give the assessors information about their group assignment.

Assessments were performed in all patients and at each time point in a fixed order to increase standardization of the procedures. In both groups, on the first day neurocognitive tests were carried out always in the following order: CPT-AX, PMIT, TMT, AVLT, CI and WCST, and on the second day real-world functioning was firstly assessed, followed by psychopathological evaluation.

The primary outcome measures of the two rehabilitation interventions were the changes in score on 3 of the 4 QLS subscales: interpersonal relationships, instrumental role and intrapsychic foundations; secondary outcome measures were the changes in score of psychopathological dimensions and neurocognitive indices.

2.4. Neurocognitive Individualized Training (NIT)

NIT is based on a computer-assisted cognitive rehabilitation program, RehaCom, developed by the HASOMED GmbH (Inc., Ltd) in Magdeburg, Germany. The patient can work with RehaCom on a personal computer; a special keyboard with simple, large and clear keys is also available and was used in the present study. All training procedures automatically adapt their difficulty to

Please cite this article as: Bucci, P., et al., Neurocognitive individualized training versus social skills individualized training: A randomized trial in patients with schizophr..., Schizophr. Res. (2013), http://dx.doi.org/10.1016/j.schres.2013.07.053