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Original article

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Implementation of cognitive rehabilitation in psychiatric services: integration of cognitive remediation and psychosocial rehabilitation

Summary

Objectives

A critical review of Cognitive Remediation, applied to schizophrenic beginnings or stages of disease, has shown that cognitive remedies are more effective when applied at an early stage of the disease. Here is presented an experience conducted at the Center for the psychotic beginnings of the Department of Mental Health of the ASL "Salerno".

Methodology

The study evaluates the outcomes of a CogPack computerized cognitive training, for a period of 12 months, on 47 patients divided into three groups of young people diagnosed with the schizophrenic syndromic spectrum. The rehabilitated functions were sustained and selective attention, verbal memory, executive functions, coordination and psychomotor speed. The following areas were assessed: Clinical (PANSS, MMPI-2) Neuropsychological (WAIS-R, BACs, WCST), functional and psychosocial (HoNOS, VADO).

Results

The neuropsychological functions affected by the intervention showed a significant improvement only in the first two groups, to which the "Cogpack" method was administered.

Conclusions

The positive outcomes in the patients who followed the CogPack cognitive training, remained stable in the 12 months following the end of the treatment. These first data confirm that the outcomes for those treatments of Cognitive Remedy appear more satisfactory in the context of a psychosocial rehabilitation program oriented to broader skills, as for the training of meta cognition and social competence.

Key words

Cognitive Remediation • Psychosocial interventions • Metacognition • Psychotic onset

Introduction

People with schizophrenia present with an impairment of their cognitive abilities with varying degrees of severity, in particular when it comes to their abilities such as information processing speed, sustained attention, working memory, verbal learning, executive functions and social cognition.

The cognitive deficit specifically is considered a marker of susceptibility to schizophrenia and is a negative predictor of the social and professional functioning of the individual, which furthermore limits the efficacy of rehabilitation treatments.

The insights offered by genetics, neuroimaging and neuropsychology have made it possible to re-assess in a complex though integrated manner, what was once considered an epi-phenomenon rather than a variable of schizophrenia progression.

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Nowadays it has been established in no uncertain way that an impairment of cognitive function is evident as early as the neurodevelopmental phase.
To-date drug therapy alone has failed to show its efficacy in any meaningful way in enhancing cognitive function, which is why in the last few decades, targeted treatment regimens have been developed in order to improve cognitive performance and as well as obtain rather ambitiously, a better clinical and functional outcome of patients with schizophrenia, albeit indirectly [1].
A wealth of published studies prove in fact the efficacy of said methods in modifying neurocognitive tests and the potential they show to positively affect attention, executive functions and social cognition.
A further positive effect has been shown on social functioning of the individual, in both the overall psychopathological aspect and negative symptoms.

Cognitive remediation as psychosocial rehabilitation strategy

Current methodologies for cognitive rehabilitation include *inter alia* a range of different treatments, both computerized and non-computerized, 1 to 1 and group therapies, which make use of specific strategies and techniques [1].
Most recent strategies rely on the model of *recovery* rather than the one based on *deficit* [2].
Cognitive remediation treatments can be classified based on two main models: compensatory and reparatory/restorative.
Compensatory treatments aim at eliminating or bypassing cognitive deficit by relying on residual cognitive abilities and/or on environmental resources [3].
The goal therefore is to facilitate learning of new skills or encourage the use of the residual ones with the aim of achieving a specific objective by affecting also the environment, thus modifying and adapting the situation in which patients live to help them overcome their disabilities.
The objective of this treatment type is above all to improve functioning rather than neuropsychological performance [4 5].
The objective of reparative/restorative treatments is on the other hand to improve and correct cognitive deficits directly by using exercises based on repetition of tasks learned or to develop new learning strategies, and are based on the insights gained in the field of neuroscience, neuroplasticity in particular, namely the possibility to actually 'repair' impaired neuro-processes.
The programs that so evidently rely on neuroscience, prescribe learning and the repetition of tasks relating to relatively isolated cognitive abilities, with the aim of reinforcing and restoring neuroanatomical connections relating to key neuropsychological abilities [6 7].
A meta-analysis of McGurk et al. [8] has proved how cognitive remediation programs entailing learning techniques based on development of strategies (re-learning) and task repetition (re-training) as well as problem-solving techniques, based on learning strategy coaching to be applied to everyday life, are more effective on functioning than those focused only on learning and practicing of skills.
A second and more recent meta-analysis by Wykes et al. [9] reached the same conclusion on the role of an approach based on strategy coaching.
The authors say in fact that the most marked and significant effects on social functioning are clear when cognitive remediation therapy is administered alongside other psychosocial rehabilitation programs and when the approach used is based on strategy coaching.
Cognitive remediation (CR) is best used within programs aimed at rehabilitation, in such a way that allows for the combination of the objectives of CR with those of psychiatric rehabilitation.
It has been observed in fact that a treatment combining both CR and psychiatric rehabilitation is more effective than either treatment alone.
The indication therefore is to provide both treatments simultaneously, side by side and in an integrated fashion.
Cognitive remediation is a cognitive-behavioural treatment for subjects who present with a cognitive impairment that interferes with their day to day normal functioning.
The goal is to help individuals develop and/or reinforce deficient cognitive abilities.
At present software programs and integrated systems useful for remedial cognition are largely available.
Some of these software programs, developed from programs initially developed for the rehabilitation due to neurological lesions, are based on repeated stimulation of specific cognitive functions, via the execution of tasks involving specific abilities.
The majority of these software programs make use of positive reinforcement as motivational tool, as well as allowing for adjustments in the duration and complexity of the tasks assigned and the possibility to adapt the treatment type to the patient's specific characteristics.
One of the most widely used computerized cognitive training programs is the Cogpack method (The Cogpack package).
The CogPack is made of 30 sub-programs that involve the cognitive and functional areas listed below: selective and sustained attention, verbal memory, visual-spatial memory, working memory, reaction time, numerical skills, problem solving.
Exercises are assigned randomly and they have a level of difficulty that can be automatically adapted to the patient's abilities, thus avoiding both the execution of too easy a task than the frustration arising from tasks that are too complex.

CogPack has proved effective in improving executive functions, information processing speed, learning and verbal fluency [10] and, when administered together with an ordinary psychosocial rehabilitation program, has been effective in functional outcome scores too.
The efficacy of CogPack on clinical, neuropsychological and functional scores, has been further confirmed by studies carried out in our country [11-13].

Cognitive treatment and psychotic onset

Cognitive deficits have an early onset, often prior to the onset of the full-blown condition, thus indicating a predisposition to the development of the pathology.
Most recent research-based data and the guidelines on schizophrenia suggest that an early and timely intervention on patients at the onset of the psychoses may not only reduce the severity and counteract biological, psychological and social consequences of the disease, but it can furthermore play a role in fighting deterioration into social functioning, which is already present when the psychoses is yet to manifest.
From a neuropsychological standpoint, some studies highlight the correlation between early onset and severity of cognitive deficits observed.
This result is even more relevant in view of the fact that cognitive deficits are not only the "core" of the condition but are furthermore the most significant predictor of the outcome.
Rajji et al. [14] in a meta-analysis have compared the neuropsychological profile of patients with early onset schizophrenia (under 18), patients with onset in early adulthood (by age 40) and patients with onset in late adulthood (older than 40).
Patients with early onset have shown when compared with the other two groups, more severe cognitive deficits in all functions assessed (IQ, executive functions, information processing speed, visual memory, working memory). A few randomized studies on patients with disease onset in adulthood have shown the efficacy of "Cognitive Remediation Therapy" in terms of cognitive function [15-17], but also in the reduction of psychiatric symptoms [18] and improvement in overall functioning [18 19].
As it is often the case however, despite the numerous research programs carried out on adult patients, there is little data available on the efficacy of cognitive treatment on patients with early or very early disease onset.
This in spite of the fact that early cognitive deficits that typically precede the onset of schizophrenia in patients with early or very early disease onset, have been widely recognized [14].
It is therefore clear that these initial signs significantly impair the performance at school and the day-to-day normal functioning of patients with early or very early disease onset and that the prognosis for this patient type is bad.

A major review of Cognitive Remediation, applied at disease onset or during the prodromal (?) phases of the disease [20 21] has shown how cognitive therapeutic remediation is more effective when used in the early stages of the disease.
This evidence suggests that taking on patients and the combination of drug and psychosocial treatments with proven efficacy may improve the quality of life of patients and their family and reduce at the same time the high material and social costs of schizophrenia.
This highlights the need for a therapeutic approach that is as integrated as possible and one that has as its main objective the treatment as early as reasonably possible of psychotic symptoms thus reducing, or event preventing altogether, the psychosocial deterioration associated to this disorder.

The experience of the Mental Health Department in Salerno. Early treatment and recovery: from cognitive remediation to integrated neurocognitive therapy

Method

The study assesses the outcome of a computerized cognitive training "CogPack" on 47 patients divided in three groups who have had a diagnosis of schizophrenia (F20-F24 ICD X) with an *average age of 20.88* (17/29 year old) (Fig. 1), *Height M 82.89* and an average duration of the disease of *13 months since disease onset.*
The neuropsychological functions object of the intervention were: *sustained and selective attention, verbal memory, executive functions, coordination and psychomotor speed*.

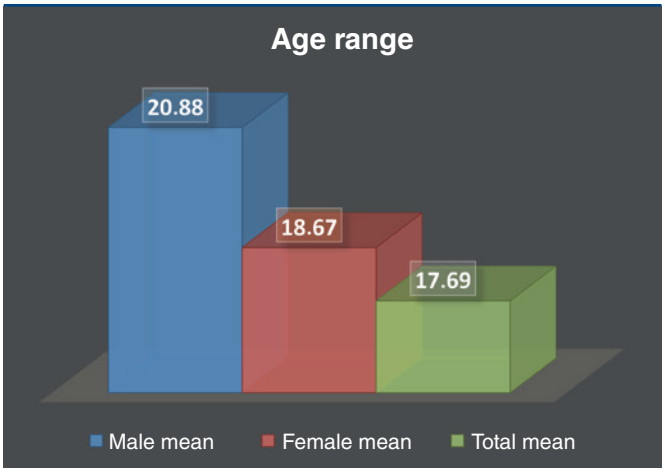


FIGURE 1. *Distribution by age groups.*

The first group is composed of 20 young people treated with Cogpack in combination with other psychosocial interventions (individual, family psychotherapy, expressive group, art therapy, occupational therapy, etc.) (Fig. 2).
The second group was made of six young patients treated exclusively with CogPack (Fig. 3).

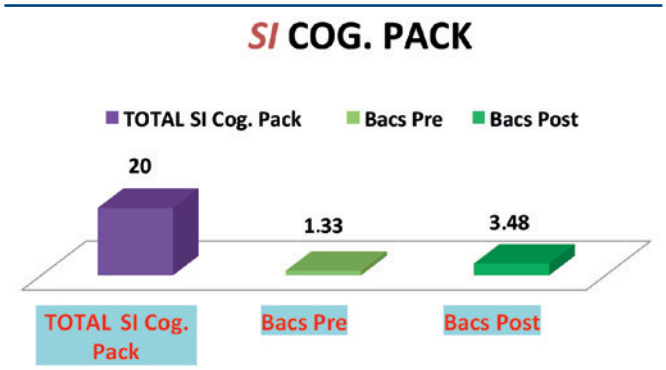


FIGURE 2. *Patients treated with the "Cogpack" method.*

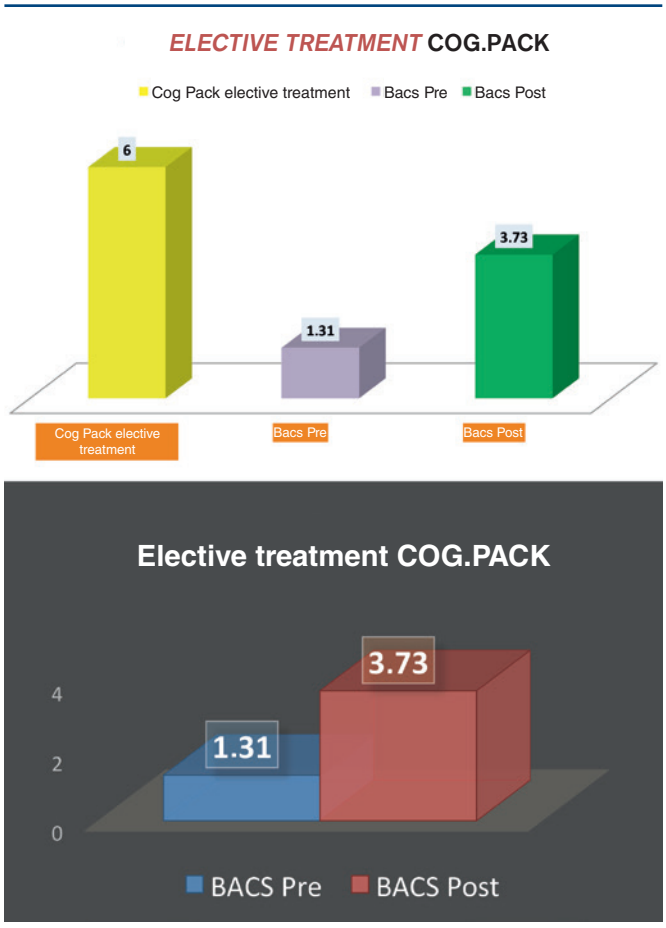
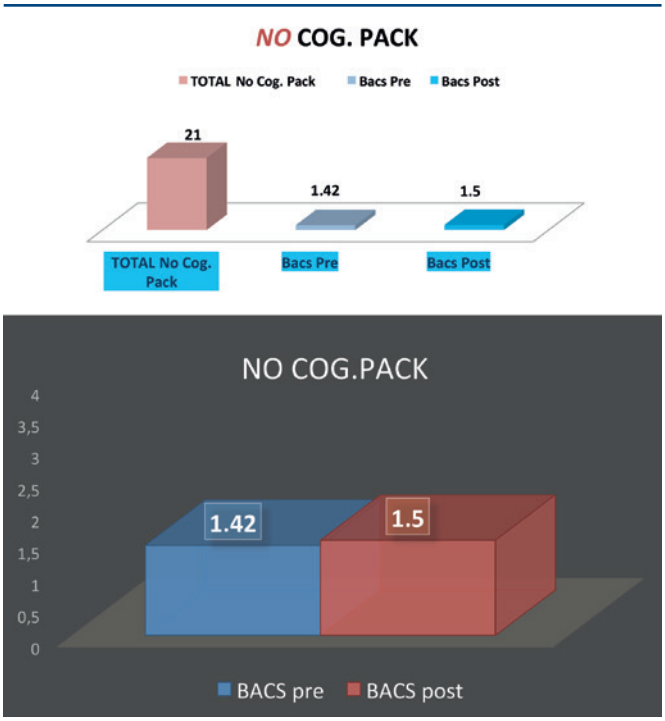


FIGURE 3. *Patients in elective treatment "Cogpack".*



FIGURES 4. *Patients who have followed a psychosocial naturalistic treatment.*

The third group was made of 21 young patients treated with psychosocial therapies without CogPack (Fig. 4).

Evaluation

The evaluation involved four specific areas for which we used the following tools: Clinical (PANSS, MMPI-2) Neuropsychological (WAIS-R, BACs, WCST), functional and psychosocial (HoNOS, VADO).
Results: the treatment duration was 12 months. The results have been evaluated by comparing the scores obtained in the BACs (pre- and post-treatment and at follow-up, 12 months since the end of treatment.
The neuropsychological functions involved in the intervention showed a significant improvement only in the groups that received the "Cogpack" method (CogPack/CCogpack plus other therapies), there were no significant changes in the third group who had not been treated with CogPack and only received other therapies.
Conclusions: The results indicate that Cogpack cognitive training can be effective for the cognitive functions most involved in schizophrenic disorders. The positive effects in patients who have followed the Cogpack cognitive training (48 sessions) in combination with other therapies, were sustained in the 12 months following end of treatment. The improvement of cognitive mentioned areas is related to the clinical insight, the social cognition and therefore functional outcome.

Patients who followed the Cogpack Treatment have also started an Integrated Neurocognitive Therapy (INT), at 6 months after the end of treatment and are currently still in treatment.

There was a significant motivation and a high level of satisfaction in all patients enrolled, no drop-out during the observation period. The number of patients that showed an improvement in functioning in social activities is significant. These first data confirm that the outcomes for those treatments of Cognitive Remedy appear more satisfactory in the context of a psychosocial rehabilitation program oriented to broader skills, as for the training of metacognition and social competence. The need to implement these interventions in care pathways on the early signs of pathology "pre-beginning" appears to be confirmed.

Conflict of Interest

None.

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