

RELATIONSHIP BETWEEN COGNITIVE REMEDIATION AND EVALUATION TOOLS IN CLINICAL ROUTINE

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SUMMARY

Many clinicians do not have adequate knowledge and interest in assessing cognitive deficits in psychiatric patients. However, these deficits are crucial and key symptoms, which can lead to impairment of quality of life, worsening of symptoms of disorders and difficulties in social, family and work relationships. Another limitation to the assessment of cognitive deficits is the poor maneuverability and practicality of the main cognitive assessment tools. Because there are no appropriate pharmacological approaches, new techniques have been developed to improve cognitive abilities in these patients. The most important techniques concern cognitive remediation (CR). In this article we summarize the main techniques of cognitive remediation.

Key words: cognitive deficits - cognitive remediation - CRT

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INTRODUCTION

Cognitive deficits are a central and enduring feature of some psychiatric disorders such as schizophrenia, bipolar disorder (BD) and major depressive disorder (MDD). They have a significant impact on the social functioning, on the response to rehabilitation programs and on psychotic symptomatology. These deficits also interfere with the overall functioning of the individual, such as work activity, quality of life and psychosocial functioning. As confirmed by numerous scientific studies, patients with schizophrenia or major depressive disorder have worse cognitive responses than healthy comparators in neuropsychological trials, particularly, in the speed of information processing, in selective attention, in working memory and in the executive function (Kaser 2017, Albert 2018). Patients with schizophrenia, for example, have profound and disabling cognitive deficits that represent an independent and separate symptom domain, with respect to negative symptoms, depression, neurocognition, and social cognition (Franza et al. 2017). Cognitive deficits are qualitatively similar in schizophrenia and bipolar and unipolar depression. However, the severity of impairment differs among these disorders, with the most severe deficits seen in patients with schizophrenia, followed by BD, and the least severe deficits noted in individuals with MDD (Russo 2015).

An important aspect of cognition in psychiatric disorder is the social cognition. Usually, it's defined as "the cognitive processes that allow people to perceive, interpret, and respond to the intentions, dispositions, and behaviors of others". And this definition underlines a link between social cognition and behaviour

that may be crucial for understanding the social impairments in some psychiatric disorders (Pinkham 2014). In this context four domains of cognition were considered: (1) emotion processing, (2) social perception, (3) theory of mind/mental state attribution (ToM), and (4) attributional style/bias. Social cognition is an important aspect in schizophrenia and other psychiatric disorders, in general, as in major depressive disorder (MDD). Indeed, several studies have highlighted deficits in executive function in approximately 20% to 40% of patients with MDD, and this impairment is disproportionately represented in patients who have not returned to full psychosocial functioning (Culpepper 2017). The definitive objective of treatment in MDD is a functional recovery, and implement of recovery needs regular clinician assessment, patient self-report, and performance testing. Below, the main cognitive assessment tools will be listed and analyzed. However, cognitive impairment in patients with depression is often overlooked because cognitive deficits and symptoms of depression often overlap. It must be emphasized that cognitive deficits are also present in other psychiatric disorders, for examples, in Mixes States (Tavormina 2017), in some personality disorders, in anxiety districts, in the OCD.

The foremost problem of the clinician is the difficulty to evaluate these domains despite the importance they have in the management of the disease. The limits of the evaluation are numerous. First of all, there is the lack of knowledge of these symptoms; then there is little information on cognitive evaluation mainly due to the reduced information of specific cognitive assessment tools. Thus, the difficulty in administering the main rapid, and repeatable cognitive assessment tools.

A “BRIEF OVERVIEW” OF COGNITIVE ASSESSMENT TOOLS

An increasing interest in the study of cognition in several psychiatric disorders has risen sharply in the last decade although cognitive problems have been described in these disorders since the beginning of the 20th century (Bralet 2008). Assessment of cognitive symptoms in the research context has a long history. Several validated instruments are available with good to excellent psychometric properties. However, in clinical practice most psychiatrists not only they are not very capable, but they do not consider their evaluation important in assessment of disorders. So, cognitive symptoms are neither fully understood nor commonly assessed in clinical practice. The use of instruments to assess cognition in major depressive disorder (MDD) and bipolar disorder (BPD) was lower, 38% and 37% respectively. Among the reported instruments used, only a few were actually appropriate for the use in the diseases (12% in schizophrenia, 3% in MDD and 0% in BPD) (Belgaied 2014). These findings reveal some lacunas in routine clinical evaluation of cognitive function.

The correct identification and evaluation of objective cognitive dysfunction is increasingly important for clinicians because it can help to formulate a correct therapeutic management of the diseases. McIntyre (2017) believes that an effective psychometric tool for assessing cognition should comprehensively assess the domains of attention and concentration, learning and memory, processing speed and executive function and should include self-rated and objective measures. Despite the prevalence and significant impact on patients' lives, during the different episodes of the disorders, cognitive symptoms are neither fully understood (Franza 2016).

The tool must be sensitive (i.e., cognitive impairment), produce consistent results across time for healthy controls, be valid and easy to administer in the clinical routine, quick and repeatable. Moreover, today, the availability and knowledge of computers make preferable the computerized tools (Hargreaves 2018). The cost of testing and restricted cooperation of psychiatric patients are both promoters for developing brief efficient batteries. Evaluating the cognitive benefits of treatments requires reliable, valid, and efficient assessment procedures. Various tools have been developed for the assessment of cognitive deficits in psychiatric patients (see table 1). The most widely used scales (including MCCB, EUFEST, CATIE, BACS, WAIS-IV), however, for complexity and time used for compiling are difficult to use in daily clinical practice. Thus, the use of instruments for cognitive assessment in schizophrenic and other psychiatric patients is very low (Franza 2016). Recently, several cognitive assessment tools have been proposed. Among the assessment tests, assessment batteries and procedures, the main ones are the following: Mini-Mental State Examination (MMSE); Brief Assessment Cognition Schizophrenia (BACS); Digit Symbol Substitution Test (DSST) designed to assess attention,

psychomotor speed, and executive function; Perceived Deficits Questionnaire 5-Item Version (PDQ) that assesses self-perceived cognitive difficulties; EpiTrack[®] (Lutz 2005) a tool designed to assess and track changes in cognitive function in people with epilepsy. Finally, the THINC-Integrated Tool (THINC-it) (McIntyre 2017) that is used in screening and assessment of cognitive Dysfunction; this tool is equipped with a simple application for tablets, free to be scribbled.

COGNITIVE REMEDIATION (CT)

These brief considerations highlight the importance of the assessment, management and treatment of cognitive deficits. As pharmacological therapies have not been found to be effective in this symptomatic group of psychiatric patients, several cognitive remediation techniques (“*cognitive remediation*”) have been developed. Therefore, there is a crucial need of new treatment strategies for patients with schizophrenia to achieve clinically relevant enhancement in these functional domains (Palumbo 2017). Over the years there has been a proliferation of new cognitive treatment approaches and several meta-analyses indicate that cognitive treatment has the most benefit when included in a comprehensive program of psychiatric rehabilitation. Cognitive remediation (CR) is, indeed, a behavioural intervention aiming to improve cognitive processes in neuropsychiatric disorders. Cognitive remediation therapy (CRT) is a psychological therapy, which improves cognitive and social functioning in several disorder such as schizophrenia, mood disorders and depression disorder. CR is a behavioural approach to treatment with basic beliefs that involve the following three components: *cognitive functions* representing separable domains (e.g., attention, memory, etc.); *rehabilitation* of impaired cognitive; *improving skills* that may result in reduced illness symptom burden or functional impairment (Dickstein 2015, Vinogradov 2012).

The Cognitive Remediation Therapy (CRT) is specifically designed for rehabilitating attention, memory and functions executive bodies, i.e., areas that are particularly deficient in schizophrenia. The Cognitive Remediation Experts Workshop in 2012 defined it as “*an intervention targeting cognitive deficit using scientific principles of learning with the ultimate goal of improving functional outcomes*”. As defined at the Cognitive Remediation Experts Workshop (Florence, Italy, April 2010), cognitive remediation therapy for schizophrenia is “*a behavioral training-based intervention that aims to improve cognitive processes (attention, memory, executive function, social cognition or metacognition) with the goal of durability and generalization.*” The CRT consists of a structured cognitive training program of three modules generated for the development of functions as cognitive flexibility, working memory and planning, with the aim of encouraging the person to acquire strategies to solve problems, with the support of a therapist who leads the subject towards an appropriate response to the demands of the environment.

Table 1. Cognitive assessment tools

		Administra- tion time	Autor/s
BACS	Brief Assessment of Cognition in Schizophrenia	35 min	Keefe et al. 2004
CATIE	Clinical Antipsychotic Trials of Intervention Effectiveness		Keefe et al. 2006
MCCB	MATRICES Consensus Cognitive Battery	60-80 min	Nuechterlein 2008, Kern 2008
WAIS-IV	Wechsler Adult Intelligence Scale - Fourth Edition	90 min	Wechsler 2008
EUFEST	European First Episode Schizophrenia Trial		Fleischhacker 2005
MMSE	Mini-Mental State Examination	10-15 min	Folstein & McHugh 1975
DSST	Digit Symbol Substitution Test	10 min	Wechsler 1981
PDQ	Perceived Deficits Questionnaire 5-Item Version	5-10 min	Sullivan et al. 1990
EpiTrack [®]		20 min	Lutz 2005
THINC	THINC-Integrated Tool (THINC-it)	15 min	McIntyre et al. 2017

Table 2. Cognitive remediation therapy programmes

CIRCuiTS Computerised Interactive Remediation of Cognition - a Training for Schizophrenia	A new generation computerised CR programme developed to enhance strategic and metacognitive processing, with an integrated focus on the transfer of cognitive skills to daily living	Wykes et al. 2018 Reeder et al. 2017
SoCIAL The Social Cognition Individualized Activities Lab (SoCIAL)	A new social cognition (SC) remediation intervention, designed for patients with schizophrenia or schizoaffective disorder, specifically aimed to improve SC). The training includes a module for emotion recognition (ER) and one for theory of mind (ToM)	Palumbo et al. 2017
SSANIT Social Skills And Neuro-cognitive Individualized Training (SSANIT)	Include a computerized neurocognitive individualized training (NIT) and a social skills individualized training (SSIT, in improving daily functioning and quality of life, and reported that although both NIT and SSIT have a favorable impact on domains of functional outcome, only NIT improves cognitive functioning	Bucci et al. 2013
COGPACK	A cognitive remediation program. It offers exercises with a variety of difficulty levels to target visual-motor functioning, comprehension, attention, memory, language use, and skills training. It also allows clinicians and users to determine the initial difficulty level	Scheu et al. 2013

In a recent article Listunova and colleagues (2018) have summarized the neurocognitive deficits during acute and remitted states of depression and their relationship with cognitive remediation therapy (CRT), physical exercise, yoga, mindfulness-based therapy, and modern neuromodulation approaches, like neurostimulation and neurofeedback training. Authors concluded that CRT is an efficacy tool as non-pharmacological treatment in these patients. Particularly, the authors emphasized acceptability and ease of administration of this tool. Moreover, Lindenmayer and colleagues (2018) emphasize the importance of cognitive remediation (CRT) with computerized social cognition. "CRT with computerized social cognition training produced greater benefits in neurocognition, including visual learning, memory, executive functions, and social cognition relative to cognitive training alone". "These findings" they conclude "favouring the combined training may be contributed to both the greater overall amount of cognitive practice, as well as the specific cognitive functions engaged by the social cognition training".

The most widespread cognitive remediation therapy programmes are in table 2.

CONCLUSIONS

In this brief communication we have tried to highlight the critical aspects of cognitive evaluation and its management. The assessment, management and treatment of cognitive deficits are a challenge for clinicians. In fact, the function of cognitive domains is a fundamental element in the management of many psychiatric disorders, for example, schizophrenic spectrum disorders, mood disorders, personality disorders. In recent years there has been an increase in knowledge on the effectiveness of cognitive assessment techniques and cognitive remediation. Simple, quick and more repeatable cognitive assessment tools, and especially accepted by patients, begin to be used in clinical practice. Some cognitive evaluation tools should be more widely used. Particularly useful, repeatable and simple to use are the Brief Assessment Cognition Schizophrenia (BACS); Digit Symbol Substitution Test (DSST); Perceived Deficits Questionnaire 5-Item Version (PDQ); EpiTrack[®] (Lutz 2005) and the THINC-Integrated Tool (THINC-it). These instruments are accepted by the patient and can be used to evaluate their effectiveness of cognitive remediation tech-

niques over time, behavioural interventions aiming to improve cognitive processes in neuropsychiatric disorders.

The cognitive remediation therapy (CRT) should be used in clinical pathology and become a priority therapeutic strategy for the management of cognitive deficits of patients affected by several psychiatric diseases.

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Francesco Franza, Barbara Solomita, Ferdinando Pellegrino & Gino Aldi conceived and designed the study; all authors approved the final version of the manuscript.

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