

INTRODUCTION: Specific learning disorders (SLD) are related to a deficit in reading, writing and math. They would be due to an executive dysfunction. Cognitive remediation (CR) is used in various pathologies associated with disorders of these functions. So what is the impact of CR on executive functions in children with SLD?

OBJECTIVES: The objective of our study was to assess the contribution of cognitive remediation in the management of children with SLD compared to a control group.

METHODS: This is an experimental comparative study that included 29 patients followed for SLD. We used cognitive Remediation Therapy (CRT) as a remediation tool. Our patients were recruited from clinical populations according to the DSM V criteria. They were divided into two groups : A first group (group 1) of 18 patients included in CRT program in addition to the usual care and a second group (group 2) of 11 patients receiving only the usual care (speech therapy and physical activity). Intelligence, cognitive flexibility, memory, inhibition, and planning were assessed.

RESULTS :

descriptive analysis	
Average age of our sample	11,17 years old
sex ratio	6.25
Average period of follow up	7,27 months

Table 1: results of descriptive analysis

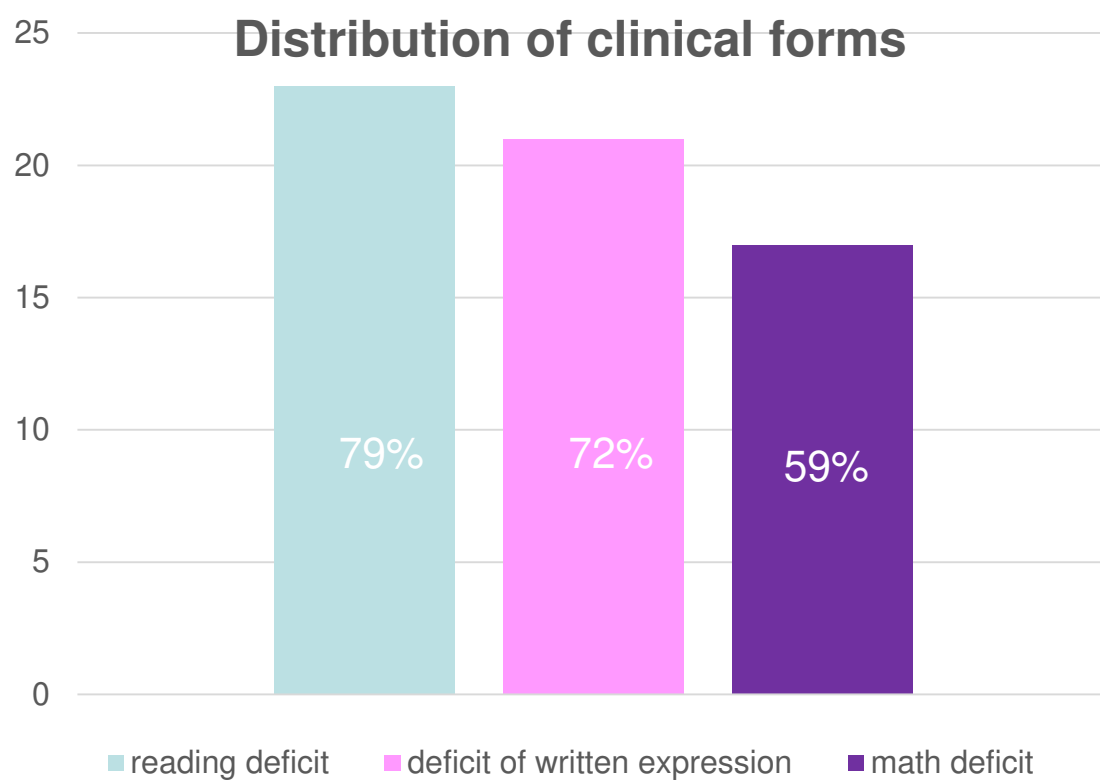


Figure 1: distribution of the different clinical forms

Comparativity of groups	p
age	0,755
sex	0,608
Reading deficit	0,429
Deficit of written expression	0,663
Math deficit	0,406

Table 2: comparativity of the two groups

We included in our study 6 children who had comorbidity with Attention Deficit Hyperactivity Disorder(ADHD), including 4 who were under psychostimulant, all of them were in group 1.

Intelligence: assessed by the CPM scores. Significant improvement of these scores at the end of the therapy: from 28.94 to 32.40 (p = 0.004). No significant improvement in children of group 2. They varied from 31 to 32.4 (p = 0.105).

Cognitive flexibility: assessed by the verbal semantic fluency test categories "animals" and "clothing" and phonemic test category "word beginning with the letter M". In group 1, significant improvement in scores of the "animal" category from 17 to 19.33 (p = 0.046). In group 2, regression of these scores: from 21.82 to 20.87.

For the "clothing" category, significant improvement in scores for group 1 from 9.86 to 10.94 (p = 0.045). We did not observe a significant improvement in scores for group 2 (p = 0.306). For phonemic verbal fluency, we found, in group 1, a significant improvement in scores going from 7.44 to 9.89 (p = 0.035). We observed a regression of these scores in the control group going from 10.64 to 9.18 (p = 0.084).

Memory test: For group 1, the digital span increased from 3.94 to 4.17 without being significant (p = 0.271). For group 2, a non-significant regression was found.

Cognitive inhibition: assessed by the Hayling test. In group 1, we found a significant decrease in initiation time "A" going from 27.50 to 16.94 seconds (p = 0.06). We found a significant decrease in "B" inhibition time going from 51.56 to 38.00 seconds (p = 0.026). We found a significant increase in correct answer scores going from 3.78 to 4.83 (p = 0.02). At the end of the CRT program, children were able to answer more quickly to the inhibition test by giving more correct responses in a meaningful way. We did not find any significant results for group 2 (p=0,142) (p=0,593) (p=0,432).

Planning: evaluated by Rey's complex figure. In group 1, we found a significant improvement in scores in copy and in memory (p = 0.003) (p <10-3). This improvement was not significant for group 2 (p = 0.533) (p = 0.182).

DISCUSSION:

In this study, children in group 1, unlike group 2, significantly improved their intelligence, cognitive flexibility, inhibition and planning. Only memory has not improved significantly in group 1. It regressed in group 2. Several studies have studied the effect of cognitive remediation on the different executive functions. A meta-analysis conducted by McGurk et al in 2007(1), focused on 26 studies and 1151 patients. The beneficial effects of cognitive remediation on cognitive performances were remarkably similar in the different studies. Our study corroborated this hypothesis. In fact, our patients have significantly improved intelligence assessed by Raven's CPM. Concerning cognitive flexibility, Tan et al(2) found a significant improvement in patients treated for schizophrenia. Our study showed that it also could improve this executive function in children with SLD. By evaluating cognitive inhibition, Giroux et al(3) found an improvement in this function in children who were followed for ADHD and who benefited from cognitive remediation. We also suppose that it is as effective in children with SLD. Concerning planification, Wykes(4), in her study of patients followed for schizophrenia published in 1999, found significant improvement in it. In our research work, planning has also improved significantly. The only executive function that has not improved significantly is memory. However, the research of Wykes et al in patients followed for schizophrenia(4), and Giroux et al in children followed for ADHD(3) were more optimistic about the effect of cognitive remediation on memory.

CONCLUSION: This pilot study shows that CRT is an effective therapeutic alternative to improve the different executive deficit functions in children followed for specific learning disorders.

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