

ABSTRACT

« Comparison between SMR and Upper Alpha Neurofeedback trainings as a non pharmacological treatment of ADHD and sleep disorders in children and adolescents »

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Background: About 5% of school-aged children may have an Attention Deficit-Hyperactivity Disorder (ADHD), a neurodevelopmental disorder often associated with other comorbid conditions including sleep disorders. ADHD became a public health concern.

Psychostimulants are the first line pharmacological treatments for ADHD. However, parents are often reluctant to medicate their children and, additionally, a proportion of patients stop their treatment because of side effects. Non-pharmacological treatments are also available. Recently, improvements of cognitive functioning and hyperactivity level of patients with ADHD have been reported after Neurofeedback trainings with a relative Upper Alpha Power enhancement paradigm. Sensorimotor rhythm (SMR) Neurofeedback has been also proposed to improve ADHD symptoms. The aim of this study is to compare the benefits of Upper Alpha and SMR trainings on ADHD symptoms and concomitant improvement of sleep.

Methods: In this controlled and randomized study, 60 French medication-free children and adolescents with ADHD aged from 8 to 15 years old will participate in 30 neurofeedback sessions. They will be assigned to either in either the SMR or the Upper Alpha training group. EEG, ADHD rating scales, cognitive assessment, and actigraphic records will be performed at pre-, mid- and post-training times, and 6 months after the end of protocol.

Results: The main expected outcome is the clinical reduction of at least 30% of ADHD symptoms, and we anticipated the superiority of Upper Alpha training over SMR in reducing hyperactivity levels. Improvement of sleep quality is a secondary outcome.

Conclusion: To date, no comparison between SMR and Upper Alpha Neurofeedback trainings with a significant number of sessions and enough patients in each group has been conducted. We hope to gain valuable insights into specific effects of both trainings on ADHD symptoms and sleep without any medication. This study would foster the development of research on Neurofeedback and its clinical applications, which are under-investigated in France.

Trial Registration: N°ID RCB 2016-A00655-46

Keywords: ADHD, Neurofeedback, SMR-Upper Alpha Training, EEG, non pharmacological treatment, sleep disorders