

Selective effects of Methylphenidate as measured by CPT among children with ADHD

Abstract

Background: The continuous performance test (CPT) is one of the most popular tools used to assess methylphenidate (MPH) effects on attention-deficit/hyperactivity disorder (ADHD) symptoms. However, many studies have questioned the ability of the CPT to consistently and reliably monitor response to MPH.

The objective of this study was to determine the effects of short term MPH administration on single and multiple parameters of attention in previously drug naïve children with ADHD, employing the MOXO-CPT.

Methods: The study included 265 children aged 6-12 years, diagnosed with ADHD. All participants performed the CPT twice. Participants were randomly divided into a study group (N=245) which received MPH treatment before the second test, and a control group (N=30) which did not receive any intervention.

Results: Participants in the study group demonstrated improvement in all CPT parameters, while the control group showed worsened performance. These differences were significant for the timing and attention parameters. Results showed that the sensitivity of the CPT to MPH effects increased as more CPT parameters were used for evaluation. .

Conclusions: The MOXO-CPT was proven to be highly effective in detecting the influence and selective effects of MPH administration in children with ADHD. Results indicated that MPH efficacy should be assessed by a combination of CPT parameters, instead of separate indices of attention. The study suggests an accurate and objective technique for the assessment of MPH efficacy in ADHD.

Distractions, Diversions, and ADHD Diagnosis

Introduction

In this study we attempted to clarify whether the incorporation of environmental distractors into the CPT would increase its validity. To improve the utility of the CPT, the current study employs a novel variant of the CPT; the MOXO-CPT (Berger & Goldzweig, 2010).

Prior research on the psychometric properties of the MOXO-CPT showed that this tool was a valid and reliable measure of ADHD in children aged 7-12 (Berger & Goldzweig, 2010).

Contrary to other CPTs, the MOXO-CPT includes visual and auditory stimuli that serve as distractors. Thus, it could be considered as a better index of ADHD in real life. In this study we wished to investigate whether the incorporation of distractors will improve the CPT's ability to discriminate ADHD children

from controls. It was hypothesized that children with ADHD would display more distractibility than controls as measured by their responses to pure visual, pure auditory, and a combination of visual and auditory distractors. In addition, it was hypothesized that the differences in performance between ADHD and control group would be exacerbated in the presence of distractors. That is, the diagnostic accuracy of the test would increase in the presence of distractors.

Methods

Participants in this study were 554 children aged 7 to 12 years, of them 289 boys and 265 girls. The study group included 226 children diagnosed with ADHD, and the control group included 318 children without ADHD. As can be seen in Table 1, the two groups did not differ in age and gender variables.

Results

In order to evaluate the difference between the groups in the degree of distractibility, independent t-tests were performed. As showed in table 2, ADHD children performed significantly worse than children without ADHD in every level of the MOXO-CPT, independently of the presence of distractors. However, as can be seen in figure 1, the disadvantage of the ADHD group was exacerbated by the presence of distractors.

Conclusions

This study investigated the effects of environmental distractors on attention performance, using the MOXO-CPT (Berger and Goldzweig, 2010).

Results showed that children with ADHD performed worse in the MOXO-CPT than children without ADHD, but this performance was exacerbated by the presence of distractors.

This finding lends support to the idea that the distractors included in the MOXO-CPT are indeed distracting ADHD children more than a control group of non-ADHD children.

In addition, study results showed that the performance of children with ADHD was negatively affected by all types of distractors (visual, auditory and a combination of them), whereas children without ADHD were not distracted by pure auditory distractors.

Measuring attention performance among ADHD versus non ADHD children

Abstract

Background: There has long been interest in developing objective laboratory-based measures that could support the clinical diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). Computerized continuous performance test (CPT) is among the most popular tools. One of the main controversies regarding the CPT is related to its low sensitivity and specificity rates. This study describes the ability and

the validity of a CPT to measure attention performance and discriminate between ADHD and normal controls.

Methods: Participants (N=788) consisted of 339 children with ADHD and 449 children without ADHD, between 7 and 12 years of age. All of the participants were tested by the MOXO-CPT.

Results: Revealed significant differences between the groups in all performance parameters. ADHD children had more difficulties in sustained attention and in reacting accurately to stimuli. In addition, ADHD children were more distracted and less able to inhibit their responses. Using ROC analysis yielded a sensitivity of 90% and a specificity of 84%.

Conclusions: In this study the CPT significantly discriminated between children with and without ADHD. The ability to discriminate between the groups has shown higher sensitivity and specificity rates than reported before. Since the use of non-valid CPT raises serious questions for research, theory, and clinical work the potential usefulness of a valid CPT might be significant for patients as well as for the treating team of professionals.