Facial emotion recognition in children with or without Attention Deficit/Hyperactivity Disorder: Impact of comorbidity

La reconnaissance des émotions faciales des enfants avec ou sans trouble déficit de l’attention hyperactivité : l’impact de la comorbidité

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ABSTRACT

Objectives. – This study sought to assess facial emotion recognition deficit in children with Attention Deficit/Hyperactivity Disorder (ADHD) and to test the hypothesis that it is increased by comorbid features.

Method. – Forty children diagnosed with ADHD were compared with 40 typically developing children, all aged from 7 to 11 years old, on a computerized facial emotion recognition task (based on the Pictures of Facial Affect). Data from parents’ ratings of ADHD and comorbid symptoms (on the Conners’ Revised Parent Rating Scale) were also collected.

Results. – Children with ADHD had significantly fewer correct answer scores than typically developing controls on the emotional task while they performed similarly on the control task. Recognition of sadness was especially impaired in children with ADHD. While ADHD symptoms were slightly related to facial emotion recognition deficit, oppositional symptoms were related to a decrease in the number of correct answers on sadness and surprise recognition.

Conclusion. – Facial emotion recognition deficit in children with ADHD might be related to an impaired emotional process during childhood. Moreover, Oppositional Defiant Disorder seems to be a risk factor for difficulties in emotion recognition especially in children with ADHD.


RESUMÉ

Objectif. – Cette étude a pour premier but d’évaluer les capacités de reconnaissance des émotions faciales chez des enfants atteints de trouble déficit de l’attention hyperactivité en les comparant à celles d’enfants au développement typique. Dans un second temps, l’objectif est de tester l’hypothèse qu’un déficit dans la reconnaissance des émotions faciales peut être exacerbé par la sévérité des symptômes comorbidites externalisés (l’oppositionalité), internalisés (l’anxiété) et émotionnels (la la bilité émotionnelle).

Méthode. – Quarante enfants de 7 à 11 ans diagnostiqués avec un trouble déficit de l’attention hyperactivité ont pris part à cette étude ainsi que 40 enfants du même âge non atteints de ce trouble. Pour évaluer la reconnaissance des émotions faciales, un test sur ordinateur a été construit à partir des images contenues dans les Pictures of Facial Affect. Ce test a été construit en trois parties : une phase d’entraînement, une phase de test (reconnaissance des émotions faciales) et une phase contrôle (reconnaissance de formes géométriques). Des données concernant la symptomatologie du trouble déficit de l’attention hyperactivité, externalisée, internalisée et émotionnelle ainsi que la sévérité de celles-ci ont été recueillies par des questionnaires remplis par les parents (Conners’ Revised Parent Rating Scale).

Mots clés :
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1. Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is a complex neurodevelopmental disorder. Most children with ADHD experience social difficulties, tend to have fewer friends and are prone to be rejected by peers [1]. The possibility of a general deficit in social cognition in ADHD [2] has been proposed to explain the difficulty in successfully interacting with others. Interestingly, it has been hypothesized that this deficit is due to specific difficulties in the ability to recognize emotions from facial expressions [3–5].

Previous studies have shown that children and adolescents with ADHD perform worse on a facial emotion recognition task than typically developing controls do. They are less accurate in identifying facial affect [3–15] and slower to recognize them [4]. They exhibit a flawed performance when presented with a variety of facial emotions as represented in static pictures [3–8, 10, 12–14], by dynamic presentation or cartoon images [6], by pictures or videos in context [8, 12] and when requested to match facial emotions with corresponding situations [11, 15]. More specifically, children with ADHD performed worse than typically developing children in recognizing negative emotions such as anger, fear, sadness and disgust [3, 5, 6, 14]. However, other studies failed to find any differences in emotion recognition between children and/or adolescents with ADHD and controls [16, 17].

Beyond the classical symptomatology of inattention, hyperactivity and impulsivity, comorbid features are frequently associated with the disorder. Both externalizing (such as Oppositional Defiant Disorder, ODD) and internalizing (such as anxiety) disorders are commonly observed in ADHD children [18, 19]. Moreover, children with ADHD and comorbidity externalizing disorders are even more socially impaired than those with ‘pure’ ADHD: in parents' and teachers’ reports, they were rated as having fewer social skills and in peer sociometric nominations, they were less accepted/liked and more rejected/disliked (for review, see [20]). Additionally, research on emotional lability has shown this clinical feature to be frequent in children with ADHD [21]. This complex picture of behavioral and/or emotional symptoms means that the profiles of children suffering from ADHD are heterogeneous and exacerbates the impairment associated with the core symptoms of ADHD.

While the majority of studies suggest that children with ADHD exhibit a facial emotion recognition deficit, their conclusions are limited because comorbidity has not often been taken into account to date. Overall comorbid ODD in ADHD children seems to play a role in facial emotion recognition deficit [22] and a significant association was found between opposition and anger recognition in children with ADHD [23, 24]. In addition to externalizing symptoms, internalizing symptoms are also thought to affect the perception of emotion. Correlations between anxiety and/or depression scores and impairment in the recognition of some negative emotions have been observed in ADHD patients [6, 14]. Moreover, in adults with ADHD, the intensity of their emotional responses (e.g. self-report of how intensely they experience affects) has been related to an emotion recognition deficit [25]. However, this hypothesis has not been tested in a children sample with ADHD.

On the whole, studies have reported a facial emotion recognition deficit in ADHD but the influence of comorbid features has received little attention. This study assesses the facial emotion recognition of children with ADHD by taking into account simultaneously the contribution of clinical features frequently associated with ADHD such as externalizing (e.g. opposition), internalizing (e.g. anxiety) and emotional (e.g. emotional lability) symptoms. We hypothesized that children with ADHD would be more impaired than children without ADHD in emotion recognition abilities and this deficit would be partially explained by comorbid features.

2. Method

2.1. Participants

Eighty children aged 7 to 11 years old participated in the study. Forty children with ADHD were recruited in an outpatient clinic specialized in ADHD diagnosis. Forty typically developing children matched the ADHD group in age and gender.

2.1.1. The clinical group

The criterion for inclusion in the ADHD group was having a DSM-IV diagnosis of ADHD given by a child psychiatrist. The diagnosis was confirmed by the administration of the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (KIDDIE-SADS-PL) [26]. Exclusion criteria were Intellectual Quotient < 70, history or evidence of neurological disorders or impairment such as epilepsy or concussion, pervasive developmental disorder, psychosis, manic episode and non-corrected visual defect. If children were taking methylphenidate, they had to discontinue it at least 24 hours prior to the experiment (in the final sample, 14 children were receiving such treatment).

2.1.2. The control group

The inclusion criteria for the control group were: absence of present diagnosis or history of ADHD as confirmed by the KIDDIE-SADS-PL and any elevated T-score (> 60) on the Cognitive Problem, Hyperactivity and ADHD Index in Conners’ Revised Parent Rating Scale [27].

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