

CASE REPORTS

Effect of methylphenidate in a child with pica and attention-deficit/hyperactivity disorder

Efeito do metilfenidato numa criança com pica e perturbação de hiperatividade e défice de atenção

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ABSTRACT

Introduction: Pica and attention-deficit/hyperactivity disorder (ADHD) comorbidity has rarely been described in the literature. It has been suggested that pica and ADHD may share some neurobiological ground and that methylphenidate may be a reasonable treatment option for these patients.

Case report: Herein is reported the case of an eight-year-old boy with pica and ADHD who was successfully treated with methylphenidate. Notably, both disorders relapsed when methylphenidate was discontinued, with symptom control regained after its reintroduction.

Discussion: ADHD and pica may share features such as poor impulse control and dopaminergic system dysfunction, with several studies suggesting that dopamine may be the implicated neurotransmitter.

Conclusion: This case report adds to the existing body of evidence suggesting that methylphenidate is effective in pica and ADHD comorbidity. Nevertheless, there is a need for further research to better understand the effects of methylphenidate on pica.

Keywords: attention-deficit/hyperactivity disorder; child; methylphenidate; pica

RESUMO

Introdução: A comorbilidade entre pica e perturbação de hiperatividade e défice de atenção (PHDA) tem sido raramente descrita na literatura. Tem sido sugerido que a pica e a PHDA podem partilhar algumas bases neurobiológicas e que o metilfenidato pode ser uma opção terapêutica nestes casos.

Caso clínico: É descrito o caso de um rapaz de oito anos com pica e PHDA tratado com metilfenidato com sucesso. Notavelmente, houve uma recidiva de ambas as perturbações quando o metilfenidato foi descontinuado, com novo controlo sintomático após a sua reintrodução.

Discussão: A PHDA e a pica podem ter uma associação através de dificuldades no controlo dos impulsos e disfunção do sistema dopaminérgico, com vários estudos a sugerir que a dopamina é o neurotransmissor envolvido.

Conclusão: Os resultados deste estudo corroboram a evidência que sugere que o metilfenidato pode ser eficaz nesta comorbilidade. No entanto, são necessários mais estudos para compreender melhor os efeitos do metilfenidato na pica.

Palavras-chave: criança; metilfenidato; perturbação de hiperatividade e défice de atenção; pica

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INTRODUCTION

Pica is defined as the persistent eating of nonnutritive, nonfood substances for at least one month in a developmentally inappropriate manner, with the behavior not being part of a culturally appropriate action.⁽¹⁾ Pica is considered a common, dangerous, and potentially life-threatening behavior in children, as it can lead to multiple complications, like choking, intestinal obstruction/perforation, mucosa damage, anemia, lead poisoning, and infection, among others.^(2,3)

Pica etiology is poorly understood and probably multifactorial. Proposed mechanisms range from psychosocial to biochemical ones.⁽³⁾ Associations have been reported between pica and micronutrient deficiencies (including iron, calcium, and zinc) and between pica and sickle cell anemia.^(3,4) The condition is more common among children of lower socioeconomic class, with cognitive deficits, or emotionally deprived.⁽²⁾ The higher incidence of pica in children with learning and developmental disabilities, including autistic spectrum disorder, is believed to be secondary to learned behaviors.^(5,6) The association with other psychiatric comorbidities, such as major depressive disorder, obsessive-compulsive disorder, and attention-deficit/hyperactivity disorder (ADHD), has also been reported.^(2,3,7)

ADHD is characterized by patterns of inattention and/or hyperactivity/impulsivity. The condition is likely caused by dopaminergic dysfunction and is responsive to psychostimulant treatment.⁽⁸⁾

Pica and ADHD comorbidity has rarely been described in the literature.^(7,9-11) A recent systematic literature review and some case reports suggest that pica and ADHD may share some neurobiological ground, emphasizing that a subgroup of pica cases may be related to impulse control problems or dopaminergic system dysfunction and that methylphenidate may be a reasonable treatment option for these patients.^(7,9,11)

This case report aims to add to the existing literature about this rare comorbidity and further investigate the use of methylphenidate in these patients.

CASE REPORT

The authors present the case of an eight-year-old boy who was referred by the family doctor to the outpatient clinic due to the ingestion of substances with no nutritive value, like paper, pencils, sand, erasers, and wood since the age of three years. He was in the second school year, and the mother reported that the frequency of these behaviors seemed to have intensified during this school year, together with worsening complaints of inattentiveness at school and home and a general lack of interest in doing homework and studying. Noteworthy, the complaints of persistent and frequent ingestion of nonnutritive, nonfood substances had started well before the inattention symptoms.

The schoolteacher reported that the boy had difficulties in paying and maintaining attention and focus at school, frequently engaging in conversations with peers during class and in minor quarrels with other students, had impulsive behaviors (like answering before the question was completed and having difficulty waiting for his turn), and poor school performance.

There was no history of pica, ADHD, or other psychiatric disorders in the family. The boy had a known history of iron deficiency anemia, which was compensated with iron supplementation and regularly monitored.

Complete blood count, serum ferritin, iron, zinc, vitamin B12, and folate levels, as well as thyroid, liver, and renal function tests, were within normal range, and height and weight were within the expected for age.

Mental status examination revealed an easily distractible and fidgety boy with trouble in focusing attention. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, he met criteria for both pica and ADHD combined presentation.⁽¹⁾ Obsessive-compulsive, anxiety, and depressive symptoms were ruled out by a systematic and longitudinal psychiatric assessment. Psychometric evaluation revealed an intelligence quotient at the lower average level but within the normal range.

The boy was prescribed 20 mg of modified-release methylphenidate, with improvement in school performance and no ingestion of non-nutritive materials in four weeks. This symptomatic improvement was maintained throughout the subsequent clinical follow-up and for the past three years.

Noteworthy, pica behavior and inattention and impulsivity complaints relapsed when the mother discontinued therapy for a period of two months, but total symptom control was regained with the reintroduction of methylphenidate.

DISCUSSION

Due to poor impulse control, several authors have placed pica within the spectrum of compulsive-impulsive disorders.^(9,12) And as in ADHD, impulsivity seems to be a cardinal feature in pica.

Only single cases of comorbid pica and ADHD have been reported in young patients, and the prevalence of this comorbidity is still largely unknown.⁽⁹⁾ Some children with comorbid pica and ADHD treated with methylphenidate have an excellent pharmacological response regarding both conditions, which seems to support the dopaminergic system dysfunction theory regarding pica etiology.^(7,9,11) A reduction of pica levels has also been reported in adolescents receiving methylphenidate with no established ADHD diagnosis.⁽¹³⁾

Some authors suggest that ADHD and pica may share features as poor impulse control and dopaminergic system dysfunction.^(9,11) Pica has also been reported to exacerbate with thioridazine, well-known for its antidopaminergic action, suggesting that neuroleptic treatment might actually worsen the behavior,⁽¹³⁾ and to improve

with bupropion, an antidepressant that acts as an inhibitor of norepinephrine and dopamine reuptake.⁽¹⁴⁾

This body of evidence suggests that pica and ADHD may share some neurobiological ground and that dopamine may be the neurotransmitter involved. However, further studies are required to confirm this hypothesis.

Clinician's awareness of pica and ADHD comorbidity and reporting of cases identified are crucial to encourage additional studies and systematic research in the area.⁽⁹⁾ This is of great relevance, as there is currently no specific pharmacologic treatment for pica.

CONCLUSION

This report adds to the existing body of evidence suggesting that methylphenidate is effective in pica and ADHD comorbidity. Nevertheless, since the literature mainly comprises single-case reports and one review, there is a need for further research to improve the understanding of the association between pica and ADHD and the effects of methylphenidate and possibly other psychostimulants on pica.

AUTHORSHIP

Diana Vieira - Conceptualization; Data curation; Formal Analysis; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Visualization; Writing – original draft; Writing – review & editing

Maria Castelo Branco - Conceptualization; Project administration; Supervision; Validation; Visualization; Writing – original draft; Writing – review & editing

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