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ADHD Masquerading as Cautopyreiophagia Exacerbated by Risperidone and Improved With Methylphenidate in a Preschooler

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The *DSM-5* defines *pica* as the consumption of non-nutritive, nonfood substances for a period > 1 month. Here, the case of a 4-year-old boy with behaviors consistent with *pica* is presented.

Case Report

A 4-year-old Kuwaiti boy was referred from the developmental pediatrics outpatient department as an unusual case of *pica*. He had the habit of eating burnt matchsticks (cautopyreiophagia), paper (xylophagia), and geophagia of a few months duration. This behavior was only recently discovered after multiple emergency department visits for unexplained recurrent abdominal pain. Developmental assessment using the Wechsler Preschool and Primary Scale of Intelligence¹ revealed the following results: full scale intelligence quotient: 88 (in the low average range), verbal comprehension: 81, visual spatial: 91, fluid reasoning: 85, working memory: 84, and processing speed: 92. Baseline laboratory workup including iron studies, vitamin D level, and thyroid function tests were all within normal limits. Blood film, lead levels, and erythrocyte protoporphyrin were unrevealing. Electroencephalogram showed generalized epileptiform discharges. Applied behavioral analysis was suggested but was not helpful. Review of parental reports as well as kindergarten records demonstrated attention-deficit/hyperactivity disorder (ADHD)-like disruptive behaviors including risk-taking behaviors (eg, dashing out into the road, throwing severe tantrums, repeated minor head trauma). Autism spectrum disorder and obsessive-compulsive disorder were ruled out on clinical grounds. Given the safety concerns, a trial of risperidone was suggested. Risperidone 0.75 mL/d over 2 weeks resulted in tangible behavioral improvement, but paradoxical exacerbation of *pica* was also reported along with increased appetite. The boy's parents requested to discontinue risperidone, as his serum prolactin level was elevated at follow-up. He was switched to methylphenidate

immediate release 2.5 mg once daily, which was titrated to 3 times daily over 1 week (weight: 19 kg/42 lb). A remarkable behavioral response was reported, but, most importantly, the *pica* dramatically improved. Twelve weeks have elapsed at the time of this writing, and he continues to do well with no evidence of *pica*. Methylphenidate response was achieved with great tolerability.

Discussion

The developmental age for *pica* is ≥ 2 years. The eating behavior should not be culturally sanctioned.² The differential diagnosis for *pica* is provided in Table 1.³

Although ADHD has been associated with comorbid eating disorders, especially bulimia nervosa,⁴ association with *pica* as in this case is limited to only case reports.⁵⁻⁷

Pica might be related to dopamine dysregulation. In a double-blind randomized placebo-controlled trial⁸ evaluating the hypothesis that *pica* may be exacerbated by the use of antipsychotics, when compared to placebo, all 3 subjects engaged in higher levels of *pica* during the thioridazine phase. These subjects showed improvement in *pica* after methylphenidate (mechanistically a DA agonist).⁸ *Pica* was reported following commencement of the atypical antipsychotics risperidone and olanzapine in 2 cases.⁹ *Pica* was also reported to be responsive to aripiprazole (partial dopamine agonist).¹⁰ The differential effects of methylphenidate and atypical antipsychotics on appetite might be contributory.¹¹

As this case illustrates, clinicians should be vigilant to probe executive dysfunction (eg, ADHD) in occasional instances of neurotypically developing children presenting with *pica* that cannot be accounted for by major psychopathology or nutritional deficiency. Use of stimulants in these scenarios is then warranted, while high-potency antipsychotics are better avoided.

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Table 1. Differential Diagnosis for Pica

Neurodevelopmental: ID, ASD, ADHD
Regression: schizophrenia, dementia
Nutritional deficiency: iron deficient anemia in pregnancy
Neurologic: Kluver-Bucy syndrome
Cultural: <i>pica</i> is culturally sanctioned (eg, tribe rituals, tied to fertility); 75% of subjects in a study from Zambia reported geophagy ³
Psychological: OCD, unmet oral needs

Abbreviations: ADHD = attention-deficit/hyperactivity disorder, ASD = autism spectrum disorder, ID = intellectual disability, OCD = obsessive-compulsive disorder.

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