

Cotton cravings: a case of pica in a 12-year-old girl with iron deficiency anemia and depression

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Summary

Pica is an eating disorder characterized by the persistent ingestion of non-nutritive substances, often associated with nutritional deficiencies and psychiatric comorbidities. Although common in children, its occurrence in association with depressive symptoms and iron deficiency remains clinically significant.

We report the case of a 12-year-old girl presenting with a six-month history of compulsive cotton consumption, accompanied by low mood, fatigue, sleep disturbance, poor appetite, pallor, palpitation, abdominal discomfort and restlessness. Laboratory investigations revealed iron deficiency anemia (Hb% - 10gm/dl, low iron, low ferritin and high TIBC). Psychological assessment confirmed moderate depression. The patient was diagnosed with Pica secondary to Major Depressive Disorder and treated with fluoxetine, risperidone, iron supplementation, psychoeducation, and behavioral modification. Marked clinical improvement was observed over four weeks, with complete cessation of cotton ingestion and normalization of mood and hemoglobin levels.

This case underscores the multifactorial etiology of Pica, involving nutritional, psychological, and psychosocial components. The close relationship between depressive symptoms, iron deficiency, and Pica behavior suggests that mood stabilization and correction of anemia are crucial for remission.

Pica may occur as a manifestation of underlying depression and iron deficiency, even in otherwise normal children. Early identification and an integrated treatment approach addressing both psychological and biological factors are vital for recovery and prevention of complications.

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Introduction

The central feature of Pica is the persistent ingestion of non-nutritive, non-food substances for a duration of at least one month, warranting clinical evaluation and management. The nature of the substances consumed varies according to the patient's age and the availability of materials. Commonly reported items include soil, hair, paper, and soap [1]. The true prevalence of Pica is difficult to determine due to variations in its definition and the tendency of patients to conceal abnormal cravings or ingestion behaviors. An incidence exceeding 50% has been reported among children aged 18 to 36 months, which is often considered within the range of normal developmental behavior. The incidence of Pica generally declines with age; however, one study reported that approximately 10% of children older than 12 years continue to exhibit Pica behavior [2]. The etiology of Pica remains poorly understood and is likely multifactorial, encompassing both biological and psychosocial factors. Proposed mechanisms include associations with micronutrient

deficiencies—particularly iron, calcium, and zinc—which are thought to contribute to the development or maintenance of the behavior. Psychosocial influences such as deprivation, parental neglect, and malnutrition in early life have also been implicated. Additionally, Pica may coexist with psychiatric disorders, and conditions leading to malabsorption, anemia, or other forms of nutritional deficiency appear to increase its likelihood [3]. Pica can lead to serious medical complications, including poisoning, gastrointestinal obstruction, perforation, and the formation of bezoars; in severe cases, these outcomes may be fatal. Despite these potential risks, few studies have systematically investigated the true prevalence and incidence of Pica [4]. In Germany, a recent population-based study involving 804 children aged 7 to 14 years and their parents found that Pica behavior had occurred in 12.3% of children at least once, with 5% exhibiting chronic Pica behavior [5]. Over several decades, accumulating evidence has consistently demonstrated a strong relationship between iron deficiency anemia (IDA) and pica.

Individuals with iron deficiency commonly experience abnormal cravings, with pagophagia (the compulsive consumption of ice) being the most frequently reported form. Likewise, patients presenting with pica are often diagnosed with underlying iron deficiency during clinical evaluation. A review of the literature found that pica may occur in up to 50% of individuals with IDA, highlighting its close association with iron deficiency.⁶

Pica has been associated with various mental and emotional disorders. Psychosocial stressors such as emotional trauma, maternal deprivation, and family disorganization are thought to contribute to Pica as a maladaptive coping mechanism. In a case report published in *The World Journal of Biological Psychiatry*, Bhatia et al. [7] described an adult female who habitually ingested chalk during periods of stress and was subsequently diagnosed with Major Depressive Disorder. The authors suggested that stressful circumstances may precipitate Pica in some ad

Case summary

Afroza 12 years of Age unmarried muslim girl student of class six hailing from urban background comes with the complaints of unusual craving for any type of cotton for 6 months. Her mother also stated that she has also unusual tendency for inhalation of mosquito aerosol, mosquito coil smokes and vehicle smokes for same duration. She also has the history of low mood and lack of interest in daily activities, pallor, palpitation and tiredness. She also developed sleep disturbance in the form of fragmented sleep and early morning awakening and couldn't be able to sleep later on. Her appetite was reduced and felt fatigue almost all over the day. Her family history reveals no psychiatric co morbidities. Her father died at 2013 and only one elder brother is a patient of gilbert syndrome.

On general examination she was found anemic with below average nutritional status. Other systemic examination reveals no abnormality.

Mental State Examination(MSE) we found that our patient was fully conscious, cooperative in terms of behavior and psychomotor activities, her face is appropriate to her age, and her speech was appropriate with normal flow and productivity. We noted that our patient showed depressed mood with vertical furrows on forehead, angle of mouth turned downwards. No abnormalities of thought and perception were found.

Her lab investigation showed Hb- 10gm/dl, serum iron 5 micro mol/L, Serum Ferritin 9 ng/ml, TIBC 84 micromol/L. Psychological tool DAAS-21 (depression anxiety and stress scale) was applied and depression was 16.

She was diagnosed with Pica secondary to major depressive disorder without psychotic symptoms according to DSM V diagnostic criteria and was started on Cap Fluoxetine 20 mg

together with iron supplements. No significant improvement was noted after a period of two weeks. In the next follow up, patient was started Cap Fluoxetine 40 mg and tab risperidone 1 mg. Psychoeducation about the nature of her illness was given to her and her family members. Patient was advised behavioral modification. Her psychosocial stressors were addressed and patient was taught relaxation techniques. Patient reported improvement in her low mood and depressive symptoms on further follow-ups in the next two weeks. DAAS-21 Scale for Depression applied after 2 weeks was found to be 06. She was abstinent from consumption of cotton during this time and for the next two months. She also admitted that she is not having the desire to eat those unwanted substances anymore. She was advised for further follow-ups and educated about treatment adherence.

Discussion

Pica may, in some contexts, represent a culturally sanctioned behavior and is therefore not always pathological. Although it is recognized as the most common eating disorder among individuals with developmental disabilities. In the present case there was no history of any neurodevelopmental disorder. While the etiology of Pica remains uncertain, recent literature has suggested its possible association with the obsessive-compulsive spectrum of disorders⁸. In the present patient, there was no history suggestive of obsessive thoughts, as she did not perceive her behavior as irrational or distressing. Several hypotheses—including psychosocial, biochemical, cultural, socioeconomic, and psychodynamic factors—have been proposed to explain the phenomenon of Pica. Deficiencies in iron, calcium, zinc, and certain nutrients such as thiamine, niacin, and vitamins B and C have been associated with Pica, particularly in children. Although Pica may at times be benign, it can also lead to serious and potentially life-threatening complications⁹. Certain psychosocial stressors have been significantly associated with Pica, including maternal deprivation, joint family settings, parental neglect, pregnancy, impoverished parent-child interactions, and disorganized family structures. The ingestion of inedible substances may lead to a range of complications, which vary in severity and can be potentially fatal depending on the nature and quantity of the material consumed. In the present case, the patient began consuming paper as a means of relieving stress secondary to depression¹⁰. In this particular case report patient has iron deficiency anemia and loss of father and illness of elder brother may cause psychological stressor and leads to depressive disorder. The marked reduction in cotton consumption following improvement in her depressive symptoms and hemoglobin level supports the conclusion that the Pica behavior was secondary to depression and iron deficiency anemia. In this patient, no other adverse effects were observed, and she

demonstrated significant improvement with psychoeducation and antidepressant therapy.

Conclusion

We hope that this case report contributes to a better understanding of this unusual behavior, which can manifest even in otherwise normal children, where factors such as depression and iron deficiency anemia may precipitate its development. Early recognition and timely intervention are essential, as neglecting this disorder may lead to further psychological or medical harm. In conclusion, this case highlights the complex and multifactorial nature of Pica and its significant impact on both physical and mental health. The findings emphasize the challenges involved in diagnosing Pica, given its varied presentations and overlapping etiological factors. Careful clinical assessment and awareness of psychosocial and nutritional contributors are essential for timely identification and effective management

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