

# Textilophagia: A Rare Form of Pica in a Young Child with Severe Iron Deficiency Anemia: Case Report

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## Abstract

Iron deficiency anemia (IDA) is among the most common nutritional disorders affecting children worldwide. While often overlooked, pica, the compulsive ingestion of non-food substances, can be an early clinical sign of IDA, which often prompts caregivers to seek medical evaluation. Although the exact cause of pica is unclear, it may be linked to altered brain signaling and can worsen iron deficiency by displacing healthy foods or causing minor gastrointestinal bleeding. We report a case of a 2-years old boy of Asian descent, who presented with IDA and an unusual pica behavior: persistent cloth-chewing and sucking (Textilophagia: Textile: fabrics, phagia: eating or consuming). Initial psychiatric evaluation ruled out autism spectrum and other psychiatric/behavioral conditions. Symptoms of anemia and textilophagia both improved on oral iron therapy. This case illustrates the crucial role of thorough history-taking, focusing on detailed dietary habits and questioning unusual behaviors in the diagnosis and management of iron deficiency anemia in young children.

Keywords: Iron Deficiency Anemia; Nutritional Deficiency; Oral Iron Supplementation; Textilophagia; Pica

## Abbreviations

IDA: Iron Deficiency Anemia; Hb: Hemoglobin; HCT: Hematocrit; MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin Concentration; RDW: Red Cell Distribution Width

## Introduction

Iron deficiency is the leading nutritional deficiency worldwide and remains the most common cause of anemia in children [1]. It can result from inadequate dietary iron intake, impaired absorption, or chronic blood loss, all of which reduce hemoglobin production, causing impaired oxygen delivery to tissues.

Pica is defined as the persistent ingestion of non-nutritive substances [2]. While mouthing is typical in toddlers, pica is diagnosed when the behavior continues beyond one month and is developmentally inappropriate [3]. Studies have shown a strong connection between pica and micronutrient deficiencies, especially iron deficiency [4]. It is also linked to neurodevelopmental and psychiatric conditions such as autism spectrum disorder (ASD) and obsessive-compulsive disorder (OCD) [5].

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Although pathophysiology remains unclear, theories suggest that iron deficiency may alter dopamine pathways, affecting reward seeking and sensory behavior, particularly in children with developmental challenges [6]. Commonly ingested substances include dirt (geophagia), ice (pagophagia). More unusual cases involve the ingestion of paper (Xylophagia), raw rice, chalk, soap, mothballs, eggshells, unpeeled lemon, and cardboard [7,8]. Textilophagia, a rare form of pica involving the chewing or ingestion of fabric, has been observed in children with developmental delays. However, up to our knowledge, its association with iron deficiency anemia was not previously reported.

#### **Case Presentation**

A 2-year-old boy presented to the emergency department with a three-day history of nausea, non-bilious vomiting, fatigue, and reduced oral intake. His parents also reported progressive pallor and decreased activity over the past few weeks. Further history revealed persistent pica in the form of cloth-sucking (textilophagia (Photo 1), which had been ongoing for a few months. Initially considered a harmless habit, but the behavior gradually intensified, and he would cry excessively if prohibited. His diet was predominantly milk-based. A prior evaluation at the age of one year had shown a hemoglobin level of 8 g/dL. He was advised to increase iron-rich food intake and prescribed a one-month course of oral iron, though follow-up was irregular. Developmental milestones were age-appropriate, and psychiatric evaluation excluded autism spectrum and other behavioral disorders. There was no family history of hematological conditions.



Photo 1: Textilophagia: sucking and chewing fabric (Written consent taken from the parents to share this photo).

Clinical examination revealed that his growth parameters were within normal ranges (height: 84 cm, 86<sup>th</sup> percentile; weight: 13.1 kg, 49<sup>th</sup> percentile). He was not in distress and his vital signs were stable except for mild tachycardia (T: 36.7°C, HR: 103 bpm, RR: 28, BP: 99/54 mmHg, SpO<sub>2</sub>: 100%). He appeared well-developed for his age with no dysmorphic features. Pallor was noted, but there was no icterus, lymphadenopathy, or organomegaly. A soft hemodynamic murmur was heard without signs of cardiac failure.

Laboratory tests confirmed microcytic hypochromic anemia, thrombocytosis, and iron deficiency, as shown in table 1-4.

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02

Parameter	Value	Reference Range
Hemoglobin (Hb)	5.7	11-14 g/dL
Hematocrit (HCT)	23	34-40%
MCV	44	75-87 fL
МСН	11	24-30 pg
МСНС	24	31-37 g/dL
RDW	28	11.5-14.5%
Platelet Count	1452	200-490 ×10 <sup>3</sup> /μL
WBC and Differential	Normal	Normal

Table 1: Complete blood count at presentation.

Test	Value	Reference Range
Serum Ferritin	0.9	12-300 ng/mL (age dependent)
Serum Iron	1.0	10-30 μmol/L
TIBC	384	250-450 μg/dL
Transferrin Saturation	10	20-50%

Table 2: Iron profile at presentation.

Fraction	Value
HbA	96.4%
HbA2	2.1%
HbF	0.7%

Table 3: Hemoglobin electrophoresis at presentation.

Test	Result	Notes
Direct Coombs Test	Negative	-
G6PD Assay	Normal	-
Peripheral Smear	Abnormal	Microcytic hypochromic RBCs, elliptocytes, teardrop cells, schistocytes, target cells, anisopoikilocytosis
Stool Analysis	Negative	No ova, parasites, or occult blood

Table 4: Additional laboratory and peripheral smear findings.

Oral iron therapy, initially with ferrous sulfate was started, and later switched to a liposomal formulation for improved tolerance and absorption. Nutritional counseling was provided to enhance dietary iron intake. He did not require blood transfusion or parenteral iron. Over two months, laboratory parameters steadily improved as detailed in table 5.

Parents noted a gradual reduction in fabric-chewing behavior, which stopped completely within a few weeks of starting iron therapy, supporting its association with iron deficiency.

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Parameter	Initial Value	Follow-up Value
Hemoglobin	5.7 g/dL	11.5 g/dL
Hematocrit	23.1%	38%
MCV	44.9 fL	66.9 fL
МСН	11.1 pg	19.9 pg
МСНС	24.7 g/dL	29.9 g/dL
Platelet count	1,452 × 10 <sup>3</sup> /μL	555 × 10³/μL
Serum ferritin	0.9 ng/mL	7.9 ng/mL

Table 5: Follow-up laboratory improvements.

## Discussion

The current case highlights a rare behavioral manifestation of IDA; textilophagia, characterized by compulsive chewing or sucking of fabric in a 2-year-old boy. Textilophagia was resolved entirely after oral iron supplementation. The clear clinical improvement and absence of neurodevelopmental abnormalities strongly suggests a causal relationship between iron deficiency and this rare form of pica. Other forms of pica like geophagia or pagophagia were frequently linked to iron deficiency in both children and adults. Ganesan et al in their literature review, described the scope of pica in adults with iron deficiency anemia, and found that geophagia and pagophagia were the most reported forms [9].

The proposed neurobiological link between iron deficiency and pica involves dopamine metabolism. Iron plays a crucial role in dopamine synthesis, a neurotransmitter involved in reward and sensory regulation. Deficiency may lead to altered sensory processing and heightened oral fixation behaviors. In this case, fabric-sucking may have been a compensatory response to sensory imbalance associated with iron depletion [10].

Similar findings in the literature suggest that pica behaviors may reflect underlying, reversible neurochemical imbalances rather than purely psychological origins. Children with autism spectrum disorder or OCD are more prone to pica behaviors [11]. Although not observed in our patient, chronic ingestion of fabric may potentially worsen anemia through mucosal trauma or occult bleeding. This behavior may also represent a form of sensory self-regulation. Matson., *et al.* emphasized the role of sensory integration therapy in managing pica among children with developmental disabilities [12].

Resolution of pica following iron supplementation is consistent with previous reports. Ganesan., *et al.* reviewed over 20 studies and found a strong correlation between iron repletion and behavioral improvement [9]. While treatment modalities vary from oral to intravenous iron or transfusion, the clinical response is typically favorable [13].

In this case, a two-month course of oral liposomal iron increased the child's hemoglobin to 11.5 g/dL and led to complete resolution of the abnormal behavior. No additional interventions were required. This case reinforces the need for nutritional screening in children with unusual habits and highlights textilophagia as a potential clinical indicator of iron deficiency.

## Conclusion

This case highlights Textilophagia as a rare previously unreported form of pica and emphasizes the value of thorough dietary and behavioral history-taking in evaluating children with suspected iron deficiency anemia. Recognizing this rare association leads to earlier diagnosis and timely treatment that ensures good outcome for both hematological and behavioral symptoms.

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04

## **Conflict of Interest**

Authors have no conflicts of interest relevant to this article to disclose.

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05

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