Case Report

Iron-deficiency anemia – often a clinical challenge

Arundhati Negi[1], Vidya G Mirji[2], Aarathi R Rau[3], A T K Rau[4]

From [1]Intern, Department of Pediatrics, Kasturba Medical College, Manipal, [2]Associate Professor, Department of Pediatrics, [3]Professor, Department of Pathology, [4]Professor and Head, Department of Pediatrics, BGS Medical College, Bengaluru, Karnataka, India

ABSTRACT

Celiac disease (CD) is an autoimmune disorder of the small intestine that has a wide array of systemic manifestations. Despite its rising prevalence, CD continues to be underdiagnosed. An 11-year-old male child presented with a history of itchy skin rash, failure to gain height, occasional diarrhea, pica, and lethargy. On physical examination, signs of anemia were present. Our patient had been repeatedly dewormed and given iron, folic acid, and vitamin B12 supplementation in the past. Clinical evaluation, serological evidence, and blood parameters raised a strong suspicion of CD. This was confirmed with a duodenal biopsy. A gluten-free diet was initiated as part of the treatment, and resolution of symptoms was observed. Our case is a stark reminder that malabsorption syndromes – particularly CD – can masquerade behind extraintestinal manifestations even in the absence of gastrointestinal complaints. Keeping CD in the differential whenever unexplained systemic signs appear allows clinicians to diagnose early and start timely management.

Key words: Celiac disease, Dermatitis herpetiformis, Microcytic hypochromic anemia, Nutritional anemia

Celiac disease (CD) is an autoimmune condition triggered by gluten ingestion in genetically susceptible individuals. Once considered rare, its prevalence in the general population has risen considerably in recent decades [1,2]. Traditionally regarded as a gastrointestinal disorder presenting with diarrhea, abdominal pain, and malabsorption, CD is increasingly being recognized as a disease with a multifaceted clinical presentation. Some of its extraintestinal symptoms include iron-deficiency anemia (IDA), short stature, delayed puberty, osteoporosis, and dermatitis herpetiformis (DH) [3,4]. IDA is one of the most common extraintestinal manifestations and may even be the sole presenting feature, often leading to delayed or missed diagnosis [5,6]. At present, the only treatment for CD is a life-long, strict gluten-free diet (GFD) leading to improvement in quality of life, ameliorating symptoms, and preventing the occurrence of related complications.

Our case report highlights the diagnostic challenge posed by atypical or extraintestinal presentations of CD in children. In our patient, the absence of classical gastrointestinal symptoms delayed the consideration of CD, despite long-standing iron-deficiency anaemia, short stature, and a chronic pruritic skin rash. Early recognition and maintaining a high index of suspicion for CD in similar clinical scenarios are imperative to initiate timely and effective treatment.

Access this article online	
Received - 11 July 2025 Initial Review - 04 August 2025 Accepted - 04 September 2025	Quick Response code
DOI: 10.32677/ijcr.v11i10.7738	

CASE REPORT

An 11-year-old male child was brought to our hospital with a 5-year history of itchy rash involving the scalp, back, and buttocks, and occasional episodes of diarrhea associated with irritability, anorexia, lethargy, poor performance in school, and reduced interest in studies and sports. It was also noticed that the child was failing to gain height compared to his peers, which was more apparent in the previous 3–4 years. The family denied any history of petechiae, purpura or easy bruising, recurrent or chronic infections, jaundice, melena, hemoptysis, hematemesis, malar skin rash, joint pains, drug intake, or contact with tuberculosis. He had earlier been repeatedly dewormed and treated with oral iron, folic acid, and vitamin B12 supplements for these complaints, but to no avail. He was referred to us by the hospital's dermatology department, where he was being treated for his persistent itchy skin rash.

On physical examination, vital signs were normal, and pallor, koilonychia, and platynychia were noted. There was no evidence of malnutrition, but he was found to be short-statured (126 cm versus an expected of 143 ± 5 cm for age). Erythematous skin lesions, measuring 0.3–0.5 cm in diameter, were present on the back and gluteal region.

Correspondence to: A T K Rau, 7/22, 1st Main Road, Ganga Nagar Layout, Bengaluru - 560032, Karnataka, India. E-mail: atkrau@gmail.com

Blood investigations (Table 1) and peripheral blood smear (Fig. 1) revealed a microcytic hypochromic picture with iron parameters severely deficient, typical of IDA.

Oral iron, folic acid, zinc, and vitamin B12 supplements were initiated, and he was dewormed with oral ivermectin and advised a healthy iron-rich diet. He returned 4 weeks later with severe pallor and effort intolerance. Hemoglobin was now noted to be 4.6 g/dL. Echocardiogram and chest X-ray were normal.

He was stabilized with a packed red blood cell transfusion, besides other supportive care. During hospitalization, he developed another episode of diarrhoea with foul-smelling stools and abdominal distension. Stool examination was positive for occult blood but absent for parasites. Keeping in mind a history of repeated episodes of bowel dysfunction, growth retardation, microcytic hypochromic anaemia, and skin lesions suggestive of DH, a working diagnosis of CD was made, and an esophago-gastro-duodenoscopy with duodenal biopsy was performed on Day 8 of admission. Duodenal mucosa was normal on gross appearance, but histopathology showed significant blunting of intestinal villi (Fig. 2a) and an increase in intraepithelial lymphocytes (Fig. 2b), consistent with a diagnosis of CD (Marsh grade 3b). In our case, the Periodic acid-Schiff-positive macrophages in the lamina propria that are seen in Whipple's disease were absent. Serum immunoglobulin A (IgA) anti-tissue transglutaminase (anti-tTG) was raised to >10 IU, and deamidated gliadin peptide antibody levels were more than >3.33 units/mL, confirming the diagnosis.

He was started on a GFD along with nutritional supplements. Over the follow-up period, his height increased by 8 cm, from 126 cm to 134 cm, accompanied by a weight gain of 5 kg (from 25 kg to 30 kg). This translated into an increase in BMI from 15.7 kg/m^2 to 16.7 kg/m^2. Hemoglobin levels returned to the normal range, and repeat nutritional markers showed significant improvement, indicating good compliance with and response to the GFD. These changes, together with the resolution of symptoms, highlight the positive clinical and anthropometric response to dietary intervention.

Table 1: Blood investigations performed at the time of admission

Blood parameters	Result
Hemoglobin (g/dL)	7.4
Packed cell volume (%)	21
Total white blood cells (cells/mm^3)	7000
Total red blood cells (millions/mm^3)	2.1
Platelet (cells/mm^3)	166,000
Reticulocyte count, corrected (%)	1
Mean corpuscular volume (fl)	66
Mean corpuscular hemoglobin (pg)	24
Mean corpuscular hemoglobin concentration (ng)	27
Red cell distribution width (%)	27
Serum iron (ng/mL)	9
Serum Ferritin (ng/mL)	13
Serum total iron binding capacity (µg/dL)	365
Erythrocyte sedimentation rate (mm/hour)	76

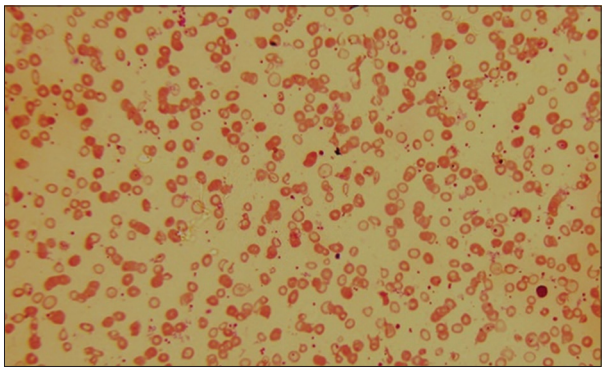

Figure 1: Peripheral blood smear showing a microcytic hypochromic picture

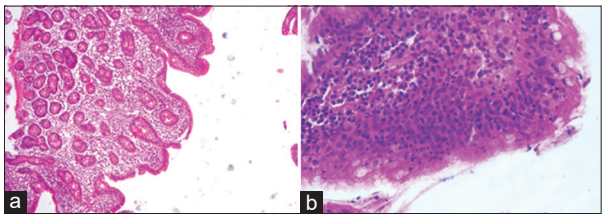

Figure 2: Histopathology images showing (a) significant blunting of intestinal villi and (b) increase in intraepithelial lymphocytes consistent with a diagnosis of celiac disease

DISCUSSION

CD, an ancient disease first described by Hippocrates, is an immune-mediated enteropathy of the small intestine triggered by ingestion of gluten (wheat, barley, rye) in genetically predisposed individuals. It affects about 1% of the population worldwide [1]. The disease is becoming increasingly common in the pediatric age group, and recent epidemiological data from the UK suggest a rise in incidence from 1 to 2 cases per year in the 1980s to about 23 cases per year between 2005 and 2011 [2].

In the case under discussion, a history of long-standing resistance to iron therapy for IDA with episodes of diarrhea, growth retardation, and skin rash suggestive of DH made us look for a diagnosis that could explain all these clinical features. Although conditions such as lactose intolerance, Whipple's disease, inflammatory bowel disease, tropical sprue, giardiasis, autoimmune enteropathy, small intestinal bacterial overgrowth, and food protein-induced enteropathies may mimic the clinical findings of CD, they were ruled out by an analysis of the clinical features and laboratory investigations which was positive for the serological markers and duodenal biopsy (Marsh 3b) of CD.

Classically associated with the symptoms of diarrhea and weight loss, CD is a clinical chameleon – a systemic disorder with widespread extraintestinal manifestations [3]. Symptoms such as DH, eczema, psoriasis, and gluten ataxia are a direct consequence of autoimmunity, whereas others, like anemia, osteoporosis, short stature, delayed puberty, and peripheral neuropathy, occur as a result of nutritional

deficiency and an inflammatory process [4]. IDA is the most commonly seen anemia, affecting roughly half of the patients [5]. Patients presenting solely with extra-intestinal manifestations can pose a significant diagnostic challenge. Recent literature proposes screening to be performed in all children with unexplained and persistent hematological abnormalities irrespective of the presence of gastrointestinal symptoms [6,7].

Multiple case reports have also demonstrated that chronic IDA unresponsive to oral iron supplementation may serve as the sole or initial manifestation of underlying CD. In one report, a 49-year-old woman with a 13-year history of irritable bowel syndrome-like symptoms was eventually diagnosed with CD after presenting with severe, unexplained IDA. Initiation of a GFD led to complete resolution of her anemia and IBS symptoms [8]. Similarly, Dina *et al*. described a 38-year-old woman with a 7-year history of refractory microcytic anemia, who had been labelled with irritable bowel syndrome. Further work-up confirmed CD, and the patient responded remarkably well to a GFD [5]. These cases, consistent with our patient's presentation, underscore the importance of considering CD in the differential diagnosis of chronic IDA, particularly when refractory to iron therapy and accompanied by subtle gastrointestinal symptoms. In our patient, there was a 6-year history of IDA that manifested in the form of lassitude, poor scholastic performance, pica, irritability, and anorexia. Skin lesions suggestive of DH were also present and further led us to think of CD as a possible etiology. Cutaneous disorders associated with CD can range from the most common DH to even rare ones like severe chronic dermatitis [9]. However, it is rarely seen in the pre-pubertal age group. Further, children with DH in CD may present with unusual skin findings, such as involvement of the face, deep dermal papules, and hemorrhagic lesions of the palms and soles [10].

The clinical complexity and heterogeneity of clinical presentations in CD have been reported in the literature. Bardakov *et al*. described a case of symmetric axonal sensorimotor polyneuropathy, encephalopathy, and non-healing trophic ulcers in the absence of clinical signs of enteropathy in a 41-year-old male who was diagnosed with CD after a period of 8 years [11]. In the case report presented by Votto *et al*., the symptoms of a 9-year-old child with atypical erythema annulare centrifugum resolved completely following a GFD [12]. In another instance, in a 45-year-old female with gait disturbance and bilateral cerebellar signs, CD was identified as the etiology behind these neurological symptoms [13]. A common feature in all these cases was the initial misdiagnosis by clinicians and a delay in the diagnosis of CD by several years.

Diagnostic workup in CD involves measuring IgA, IgA anti-tTG, and anti-endomysial antibodies. An endoscopic biopsy of the duodenum showing characteristic histological features confirms the diagnosis. It is important to instruct the patient to be on a GFD when these investigations are performed [2]. Lifelong strict adherence to a gluten-free regimen leads to resolution of symptoms over time, seronegativity, and regrowth of intestinal villi [14]. In our case, the patient was started on a strict GFD along with oral iron (ferrous citrate at 3 mg/kg/day) and multivitamin (folic acid, zinc, and vitamin B_{12}) supplementation. Over the following months, there was marked clinical improvement with resolution of the skin rash, increased energy levels, and catch-up growth – gaining 8 cm in height within 1 year. Hemoglobin levels normalized, and repeat nutritional markers showed significant improvement, reflecting good compliance and response to GFD.

We conclude that it is imperative to consider a diagnosis of CD in patients with a history of unexplained, long-standing, and non-responsive nutritional anemia. Clinicians must have a high index of suspicion even in the absence of classical gastrointestinal symptoms. Early recognition of CD is crucial in this growing age group to prevent children from developing the long-term consequences of short stature and poor scholastic performance while achieving hematological recovery and improved growth velocity.

CONCLUSION

CD must be considered as a differential diagnosis in all children presenting with unexplained refractory anemia and growth retardation, even in the absence of classical gastrointestinal complaints. Early recognition of this disease allows timely intervention, leading to complete resolution of symptoms and improved growth outcomes.

REFERENCES

1. Kavimandan A, Sharma M, Verma AK, Das P, Mishra P, Sinha S, *et al*. Prevalence of celiac disease in nutritional anemia at a tertiary care center. Indian J Gastroenterol 2014;33:114-8.
2. Thomas PC, Tighe MP, Beattie RM. Coeliac disease in children. BMJ 2018;363:k3932.
3. Laurikka P, Kivelä L, Kurppa K, Kaukinen K. Review article: Systemic consequences of coeliac disease. Aliment Pharmacol Ther 2022;56 Suppl 1:S64-72.
4. Leffler DA, Green PH, Fasano A. Extraintestinal manifestations of coeliac disease. Nat Rev Gastroenterol Hepatol 2015;12:561-71.
5. Dina I, Iacobescu C, Vrabie C, Omer S. Long-standing iron-deficiency anemia in an atypical celiac disease - a case report. J Med Life 2014;7 Spec No 4:99-102.
6. Von Graffenried T, Rizzi M, Russo M, Nydegger A, Kayemba-Kay's S. Atypical hematological manifestation of celiac disease: A case report of aplastic anemia in a 2-year-old child and review of the literature. Pediatr Investig 2021;5:159-62.
7. Surana A, Chaudhari V, Patel S. Seronegative celiac disease: A case report. Int J Res Med Sci 2017;5:737-9.
8. Meseeha MG, Attia MN, Kolade VO. Celiac disease unmasked by acute severe iron deficiency anemia. J Community Hosp Intern Med Perspect 2016;6:31439.
9. Ancona S, Bianchin S, Zampatti N, Nosratian V, Bigatti C, Ferro J, *et al*. Cutaneous disorders masking celiac disease: Case report and mini review with proposal for a practical clinical approach. Nutrients 2023;16:83.
10. Persechino F, Galli G, Persechino S, Valitutti F, Zenzeri L, Mauro A, *et al*. Skin manifestations and coeliac disease in paediatric population. Nutrients 2021;13:3611.
11. Bardakov SN, Tran MD, Lapin SV, Moshnikova AN, Kalinina EU,

Bogdanova EG, *et al*. Acrodystrophic axonal polyneuropathy with celiac disease: A case report. J Med Case Rep 2021; 15:615.
12. Votto M, De Filippo M, Licari A, Caimmi S, Marseglia GL, Davidovich S, *et al*. Atypical erythema annulare centrifugum in a child with celiac disease. Clin Case Rep 2021;9:e04441.
13. Jain D, Bhaduri G, Giri K, Balania V, Jain P. Underlying coeliac disease in a case of cerebellar ataxia with unknown etiology. Arch Clin Cases 2019;6:22-5.
14. Caio G, Volta U, Sapone A, Leffler DA, De Giorgio R, Catassi C, *et al*. Celiac disease: A comprehensive current review. BMC Med 2019;17:142.

Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Negi A, Mirji VG, Rau AR, Rau AT. Iron-deficiency anemia – often a clinical challenge. Indian J Case Reports. 2025; 11(10):499-502.