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# Severe iron deficiency anaemia with very low haemoglobin in pediatric age group

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**ABSTRACT**
Iron deficiency anaemia (IDA) is the most common single-nutrient deficiency worldwide, posing a significant public health challenge due to its extensive impact on vulnerable populations, particularly children. In the pediatric population, especially among children aged 1–5 years, IDA affects approximately 1–2% in developed regions, with a significantly higher prevalence in low socioeconomic settings. This disparity is attributed to multiple factors, including inadequate dietary intake of bioavailable iron, recurrent infections, parasitic infestations, and limited access to healthcare.

**Keywords:** IDA, factors, population, single.

## BACKGROUND

Iron deficiency anaemia (IDA) is the most common single-nutrient deficiency worldwide, posing a significant public health challenge due to its extensive impact on vulnerable populations, particularly children. In the pediatric population, especially among children aged 1–5 years, IDA affects approximately 1–2% in developed regions, with a significantly higher prevalence in low socioeconomic settings. This disparity is attributed to multiple factors, including inadequate dietary intake of bioavailable iron, recurrent infections, parasitic infestations, and limited access to healthcare[1].

IDA is particularly concerning early childhood—a critical period for growth and neurodevelopment. Iron is essential for various physiological processes, including cognitive, motor, and socio-emotional development. A deficiency during this time can lead to long-term deficits in memory, attention, and behaviour, potentially affecting academic performance and quality of life well into adolescence and adulthood[2].

A comprehensive evaluation of pediatric anaemia necessitates detailed histories, including perinatal, maternal, and nutritional factors. Risk factors such as preterm birth, maternal anaemia, exclusive breastfeeding without iron supplementation after six months, and poor dietary diversification are often implicated. Clinically, IDA not only manifests withhaematological abnormalities but also has systemic implications, underscoring the need for prompt diagnosis and treatment[3].

IDA is both preventable and treatable when interventions are timely. The World Health Organization (WHO) recommends routine anaemia screening at 12 months of age, particularly in high-risk populations. Diagnostic evaluation begins with a complete blood count (CBC) to confirm anaemia and evaluate red blood cell indices. Further tests, including red blood cell distribution width (RDW), serum ferritin, and transferrin saturation, help differentiate IDA from other causes of microcytic anaemia, such as thalassemia trait or chronic disease[4].

Addressing IDA requires a multifaceted approach, combining clinical care with public health strategies. Dietary fortification, iron supplementation programs, and education on appropriate nutrition are critical tools for reducing its prevalence. Ongoing research emphasizes the importance of early intervention to reverse developmental delays and mitigate the long-term complications associated with untreated IDA[5].

**Case report**

We present a case of 8 months old boy, a Mauritania boy, medically free before

He presented to the emergency room with a history of poor oral intake for 5 days, diarrhoea for 5 days, and vomiting for 2 days.

He was in his usual state of health until 5 days back when he started to have a decrease in his oral intake With a history of diarrhoea watery, moderate in amount, and was 2-3 times per day associated with a history of recurrent vomiting, whatever his milk-fed, non-bloody, and non-projectile.

There was no recent history of fever, cough, congestion, shortness of breath or rash. In addition, there were no bleeding symptoms of bruising, hemoptysis, hematemesis, hematochezia, melena, any joint pain or swelling, or lymphadenopathy.

The patient is the product of a 38-week gestation delivered via cesarean section due to a previous cesarean section, No NICU admission, The pregnancy was naturally conceived. Her mother was on vitamins and denied other medication. She denied pregnancy complications such as diabetes, infection, fever, rash, hypertension, or bleeding .

The baby was exclusively breastfed, with the starting introduction of solid foods. Was on vitamin d3 4 drops per oral daily, and no other medication, he was delayed in vaccination, only up to 2 months vaccinated up to date according to the Saudi immunization schedule. The baby as per his parent has developed normal milestones as per his age, he can Sit without support, smile and laugh when they play peek-a-boo.

The baby has no previous admission,

The mother's and Father's medical history is insignificant for haematological disease, they are healthy, with no Consanguinity.

There is no known family history of birth defects, haematological or oncological disease, no bleeding disorder.

On physical examination, he was afebrile (36.6 °C), blood pressure was 102/48 mmHg, heart rate was 156 beats per minute (bpm), respiratory rate was 40 breaths per minute, and oxygen saturation was 99% on room air. His height was 76 cm above the 75 percentile and his weight was 10 kg above the 75 percentile. He was ill, hypoactive, marked pallor with pale mucous membranes and conjunctiva, conscious, alert, GCS 15/15 without any neurological deficits and CRT less than 2 seconds with bounding peripheral pulses. He had no palpable lymphadenopathy. He was breathing comfortably on room air and no signs of respiratory distress. His cardiac examination was normal first and second sounds with Systolic Ejection Murmur. His abdominal examination was soft and lax with hepatomegaly. His musculoskeletal examination was unremarkable. No bleeding was noted in any part of his physical examination

**Investigation**

He was admitted directly to the pediatric intensive care unit after his haemoglobin was found to be critically low at 1.8 g/dL on two consecutive measurements with an unclear aetiology of blood loss at the time of presentation. Note that no intravenous fluids were administered before obtaining the haemoglobin levels.

| | First | Second | Third | Discharge | Opd |
|---|---|---|---|---|---|
| **Wbc** | 7.7 | 7.2 | 6.6 | 10.9 | 23 |
| **Hg** | 1.8 | 6.4 | 6.6 | 11.4 | 9.6 |
| **Plt** | 307 | 241 | 221 | 237 | 334 |
| **Mcv** | 62 | 71 | 65 | 70 | 75 |
| **Hot** | 5.3 | 22 | 20 | 36 | 27 |
| **Raw** | 20 | 17 | 15 | 14 | 29 |
| **RETICS** | | | | | 17.6 |

*Opd: out-patient department follow up

| | | | | | |
|---|---|---|---|---|---|
| **Na** | 136 MMOL/L | **Ferritin** | 1690 | 369 | |
| **K** | 3.74MMOL/L | **TIBC** | 39 UMOL/L After PRBC | | |
| **Bun** | 1.5MMOL/L | **Iron** | 30 UMOL/L After PRBC | | |
| **Create** | 18 UMOL/L | **CA** | 2.2 MMOL/L | | |
| **Ast** | 90 U/L | **PT** | 17.8 SEC | | |
| **Alt** | 74 U/L | **PTT** | 24.7 SEC | | |

| | | | | |
|---|---|---|---|---|
| **alb** | 39 G/L | **INR** | 1.32 SEC | |

*PRBC: Packed red blood cell

Peripheral smear showed erythrocytes with marked microcytosis, anisocytosis, and hypochromia**.**
HG electrophoresis done after 3 months of discharge show
HbA: 93.9 HbF: 3.9 HbA: 2.2

**Treatment**

The Patient was admitted with severe microcytic anemia.Initially admitted to pediatric intensive care for observation for 2 days. Received twice Packed red blood cell (PRBC).
Then Shifted To The Ward For 3 Days For Observation.
Routine investigation is done. During the admission,the patient improved clinically. Seen by cardiology.
Pediatric haematology informed about the case, and they agreed with the diagnosis.
Discharge in good condition with out-patient clinic Department appointment (OPD and oral iron and multivitamin.
Hg electrophoresis givesan appointment to do after 3 months.

**CONCLUSION**

Our study showed that although Iron deficiency anemia is always considered a chronic threatening diagnosis it can present with severe anemia that could lead to unfavorable outcomes. IDA should always be one of the differential diagnoses in patients presenting with acute non-hemolytic anaemia with stable hemodynamics especially in the pediatric population as there are great varieties in their nutrition and dietary habits. Education for parents about the importance of a balanced diet and the frequency and risk factors for developing IDA is very important as it can be prevented by appropriate screening and management before reaching severe stages.

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