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Pancytopenia in 7 Year - Old Child with Severe Iron Deficiency Anemia: Case Report

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Abstract: ***Iron deficiency anemia (IDA) is the most common cause of anemia in childhood worldwide and it is commonly due to nutritional problems in developing countries. It is usually accompanied by normal white blood cells (WBC) and normal or increase platelet count. Pancytopenia can be a rare manifestation of IDA. Here, we report a 7-year-old male child who presented IDA with pancytopenia, without other causes of pancytopenia or any other malignant disease. This patient is a rare pediatric case with severe IDA who exhibited pancytopenia. The patient has received a packed cell transfusion because he had symptomatic anemia. His blood parameters were normalized with the starting and continuation of iron supplements. This case demonstrated that patients with severe IDA may present as a case of pancytopenia. Conclusion: This case demonstrated that patients with severe IDA, may also have leucopenia and thrombocytopenia. Thus, severe iron deficiency should be added to the list of conditions leading to pancytopenia.***

Keywords: Anemia, iron deficiency, Leukopenia, Thrombocytopenia, pancytopenia, Children

1. Introduction

Iron deficiency anemia (IDA) is the most common hematological disorder in the community [1]. In children the prevalence of IDA is three to four times higher in developing countries than in developed countries [2], [3], making it a quite significant public health worldwide problem. From the laboratory view, however; in iron deficiency anemia (IDA) Usually white blood cell (WBC) counts are normal, while platelet count is normal or elevated as a reactive thrombocytosis; even in some cases higher than 1,000 × 10^9/L at diagnosis [3]-[5].

However, IDA could accompany leucopenia and thrombocytopenia, even though it is extremely rare. There is a previous report of severe IDA with thrombocytopenia [6]-[8], or associated with leucopenia and even present as pancytopenia.

Here, we report a child who presented Severe IDA with leucopenia or thrombocytopenia as a separate entity, or present as pancytopenia [9],[10]; without other diagnoses such as bone-marrow failure, or any other malignant disease. Thus, this patient is a rare pediatric case with severe IDA by who exhibited pancytopenia.

2. Case Presentation

We describe a 7-year-old Libyan boy who admitted to the pediatric department in our hospital with a history of pica, dyspnea on exertion, anorexia, weight loss two months durations. Physical examination revealed marked pallor and scalp infection (tinea capitus), tachycardia, no tachypnea or icterus. Therewas no lymphadenopathy,edema, petechial rash or bruises.

Cardiovascular examination revealed a soft hemic murmur at the base of the heart. No hepatosplenomegaly, Lung fields were clear and neurological examination was normal.
Laboratory investigation revealed: hemoglobin (Hb): 4.2 g/dL; mean corpuscular volume (MCV): 57 fL; red cell distribution width (RDW): 28%. Reticulocyte count was 2.2%, Peripheral blood smear showed an isopikilocytosis with predominant hypochromic microcytic cells. Iron studies' results were consistent with iron deficiency, as follows: serum iron: 13 µg/dL; total iron-binding capacity: 416 µg/dL; ferritin level: 10 ng/mL. The patient's white blood cell (WBC) count was 3.7 × 10^3/µL (1.5 × 10^3/µL neutrophils) and plateletcountwas52 × 10^3/µL.

The other causes of pancytopenia were evaluated including and including serum Folic acid 9.3 ng/ml, vitamin B12 696 pg/ml (all in the normal range). Histopathological examination of the bone marrow revealed a hypercellular marrow; the normal number of erythroid cells mildly decreased the number of megakaryocytes and no blasts.

Severe symptomatic anemia necessitated transfusion with packed red cells followed by starting oral iron plus dietary advice. In our patient after oral iron supplementation was initiated their peripheral blood counts normalized rapidly.

3. Discussion

Our patient presented as a case of pancytopenia, with a hematological picture of severe iron deficiency anemia associated with thrombocytopenia and leucopenia.He wasgiven a blood transfusion for treatment of symptomaticanemia followed by the initiation of oral iron replacement therapy. This result in improvement in the platelet as wellas total leucocyte counts and finally complete recovery of all blood picture with continuing of iron therapy.

Although iron deficiency anemia usually presents just as microcytic hypochromic anemia without the involvement of other blood elements but other hematological parameters may be affected aswell[6]. Often, iron deficiency is associated with normal or elevated platelet counts as reactive thrombocytosis [4], [6], [11].The thrombocytosis may result from a high level of erythropoietin inducting the thrombopoiesis[12].

But as the anemia became more severe the reverse was

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occurring resulting in decreased platelet count to the normal level [13],[14] or even to thrombocytopenia [15]-[17].The mechanism of thrombocytopenia in iron deficiency might be an early response to direct stimulation of the EPO receptor on megakaryocytes; or shunting into the erythroid precursors' pathway, leading to thrombocytopenia[18].

Leukopenia may also occur to patients with IDA [19]. The exact mechanism of this is unclear but may be related to the alteration in the activity of iron-dependent enzymes in thrombopoiesis and leucopoiesis [20],[21].

4. Conclusion

To our knowledge, IDA combined with pancytopenia is very rare. Here, we experienced that in patients with severe IDA may be present as pancytopenia.

Consent
The patient was informed about the intent to publish this report and consented to the same in writing.

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