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A Case of Rheumatoid Arthritis Associated with Microcytic Anemia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Rheumatoid arthritis (RA) is one of the most common inflammatory arthritides. It is associated with multiple systemic features, including hematological manifestations such as anemia, neutropenia and thrombocytopenia. However, immune hemolytic anemia is extremely rare with only 3 reports indexed in medline, and one of them being due to methotrexate toxicity.
Microcytic anemia is a condition in which the body's tissues and organs do not get enough oxygen. This lack of oxygen can happen because the body does not have enough red blood cells, or because the red blood cells do not contain enough hemoglobin, which is a protein that transports oxygen in the blood.
Case Presentation: A 60 year old female a known case of rhematoid arthritis and hypothyrodisam in 2013 for last past 3 years. Who presented to us with history of recurrent anemia . In march 2021, she was admitted to hospital because of palpitations and shortness of breath due to severe

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anemia. Results of laboratory studies were hemoglobin, 6.9 gm/dl and haptoglobin, less than 29.8mg/dl. A diagnosis of anemia was made on the basis of the laboratory findings She was transfused with 1units packed red blood cells (pRBCs) over less than 6 hours. High-dose PSL (50 mg/day) was started, and the anemia improved. The hemoglobin level increased to 7.0 gm/dl within the 1st week.

Conclusion: The differential diagnosis of various hematological disorders should include rheumatic autoimmune diseases among other causes of blood cell and hemostasis abnormalities. It is crucial that hematologists be aware of Treatment should be administered promptly, with rheumatological consultation.

Keywords: Osteoarthritis; aneia; hypothyroidisam.

1. INTRODUCTION

Most chronic inflammatory rheumatic diseases are complicated by hematological abnormalities, including anemia, disorders of leukocytes, platelet, and the coagulation system, and hematological malignancies. Patients with RA may suffer from a variety of hematological disorders, particularly anemia, leucopenia, and thrombocytosis [1].

Chronic inflammatory rheumatic diseases are complicated by hematologic abnormalities, including anemia; disorders of leukocytes, platelets, and the coagulation system; and hematologic malignancies[1]. Rheumatoid arthritis (RA) is one of the most common inflammatory arthritides. It is associated with multiple systemic features, including hematological manifestations such as anemia, neutropenia and thrombocytopenia. However, immune anemia is extremely rare with very few reports, and one of them being due to methotrexate toxicity[1].

According to epidemiologic data from World Health Organization (WHO), 24.8% of the human population is currently suffering from anemia out of which a major portion is due to iron deficiency anemia. Hypochromic microcytic anemia is more common in premenopausal females because they lose blood with each menstrual cycle. Among the female population, almost 41% of all pregnant females suffer from anemia while among nonpregnant pre-menopausal females 30% females are struggling with anemia. The male population is usually resistant to anemia due to circulating testosterone levels. However, 12.7% adult males are also globally afflicted with anemia. After the female population, pre-school aged children suffer the most from anemia because of lack of iron in their primary diet. Human milk contains 0.3 mg/L iron which does not provide enough iron. On the other hand, cow milk contains double the amount of iron, but that iron has poor bioavailability[2].

The first test to perform is complete blood count (CBC) which will indicate towards the presence of anemia after a thorough physical exam. CBC will show different RBC indices like MCV and MCHC. These parameters comment on the quantity of hemoglobin inside the RBCs they are both usually decreased in hypochromic microcytic anemia. The Next test to perform is iron studies which take a look at transferrin saturation, total iron binding capacity, and ferritin. TIBC is usually increased in iron deficiency anemia, while transferrin saturation is markedly decreased in iron deficiency anemia. A ferritin level below 12 ng/ml in the absence of scurvy is a reliable indicator of iron deficiency anemia. However, a low or normal ferritin level does not exclude the diagnosis of iron deficiency anemia because ferritin is an acute phase reactant protein and its level increase during the time of infections. As iron levels fall, transferrin levels increase in compensation[3, 4, 5].

2. CASE PRESENTATION

A 60 year old female with presented fatigue,weakness,brethlessness since from last 2week before admission . She was diagnosed to have rheumatoid arthritis by a private practitioner and was on non-steroidal anti-inflammatory drugs and glucocortico steroid therapy for the past 3 years. She was also given hypoyhrodisam treatment since from 3 years. haematological investigations showed severe anemia with elevated reticulocyte count was 3.0% and slightly elevated LDH (272 U/L) with bizarre red cell indices (Table 1) . Coomb's test was negative.

Her anemia initially responded to prednisolone 0.5 mg/kg and Tab. Omnacortil 10 mg daily.

Due to relapse of anemia. The hemoglobin level increased to 7.8 g/dl within the 1st week Tab.

Methotrexate 5mg /week, Tab Hydroxychloroquine200mg continue, Tab Levothyroxine 25mg daily , Tab. folic acid 5mg, Tab Calcium (mineral) and Cholecalciferol (Vitamin D3) 500 mg continue, Tab leflunomide10 mg, OD .Tab Pantoprazole BD. platelet counts were normal ruling out hypersplenism. Anemia continued independent of her joint disease. Currently her arthritis is in remission and it had been stable for the last 2 to 3 months of follow up. With no clear evidence of immune mediated hemolysis or hemoglobinopathy, the possibility of anemia being a direct consequence of RA was considered and we believe that the most likely explanation for this anemia was the low-dose MTX because the anemia appeared soon after treatment was started.

3. DISCUSSION

Rheumatoid arthritis (RA) is characterized by hyperplasia of the synoviocytes, especially the synovial fibroblasts, which results in bone and joint destruction [6]. Rheumatoid arthritis, among the most frequent autoimmune disease, is characterized by a chronic joint inflammation possibly leading to severe damage [7]. Recent studies have revealed that cytokines and other mediators of inflammation in the development of RA play a key role in the articular syndrome as well as a whole range of systemic manifestations of the disease [8]. In particular, anemic syndrome is a very common manifestation of rheumatoid inflammation. According to literature study by Bloxham et al [9]. anemia develops in 30-70% of patients with RA. Different types of anemia,

Table 1. Hematological parameter of patient

Investigation		
Test	Result	Biological Ref Interval
Hemoglobin (colorimetric)	6.4gm/dl	12.0-15.0gm/dl
Hematocrit (calculated)	22.2%	36-4.8
M.C.V(Impendence)	50.8fl	83-101
M.C.H(Calculated)	18.4pg	27-32
M.C.H.C(Calculated)	28.8gm/dl	30-36
RDW-CV(Calculated)	24.0%	11.5-15.0
W.B.C Count	12270	4000-10000
Reticulocyte count (Fluroscent)	3.0%	0.5-2.50
Ret He (Fluroscent)	21.5pg	28-37
IRF(Fluroscent)	20.9%	0.0-10.0
Platelet -o ((Fluroscent)	492	150-410
ESR	101mm	0-20
Haptoglobin(serum, immunoturbidimetry	29.8mg/dl	30-200
Uric acid (mg/dL)	6.8mg/dl	2.4-6.0 mg/dl
LDH	120–246 U/L	272 U/L
TSH	0.5 to 5.0 mIU/L	0.4 mU/L
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LDH, lactate dehydrogenase; MCV, mean corpuscular volume; MCH, mean corpuscular hemoglobin.

including iron deficiency anemia (IDA), anemia of chronic disease (ACD), the combination of IDA and ACD (COMBI) anemia, megaloblastic anemia, and hemolytic anemia, have been seen in patients with RA. Some causes of this blood disorder include changes in iron metabolism due to lesions of the mucous membrane in the gastrointestinal tract resulting from the use of steroids or methotrexate, a shortening of the life of red blood cells (RBCs), and the inadequate production of RBCs by the bone marrow[9,10].

4. CONCLUSION

Multiple autoimmune syndromes is a rare pathological condition, predominant in women. The main interest is in the early detection of new autoimmune diseases by monitoring of susceptible patients. There would be probably a genetic predisposing.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline Patient's consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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