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Case Report

Sickle cell anemia: a mimicker of rheumatoid arthritis

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ABSTRACT

Sickle cell disease (SCD) is a genetic disorder characterized by presence of abnormal hemoglobin S, leading to sickling of RBCs. The prevalence of sickle cell carriers among different tribal groups varies from 1-40%. Rheumatoid arthritis closely mimics the bone crisis symptoms in sickle cell anemia hence prompt diagnosis should be made to commence correct choice of treatment. We reported an 18 year old female with sickle cell disease who presented multiple intermittent joint pain of both limbs for 6 years with acute worsening of pain for the past 7 days. Diagnosis of sickle cell anemia becomes important as musculoskeletal manifestations of the disease can mirror the symptoms of inflammatory arthritis and the treatment given for rheumatoid arthritis can potentially worsen the condition in patients with sickle cell anemia.

Keywords: Sickle cell anemia, Vaso-occlusive crisis, Rheumatoid arthritis, Exchange transfusion

INTRODUCTION

Sickle cell disease (SCD) is a genetic disorder characterized by presence of abnormal hemoglobin S, which leads to sickling of RBCs when deoxygenated. The prevalence of sickle cell carriers among different tribal groups varies from 1 to 40%.[1] Repeated vaso-occlusive pain episodes are the mainstay of SCD.[2] The primary pathophysiology is based on the polymerization of deoxy HbS with formation of long fibers within the RBCs causing a distorted sickle shape which eventually leads to increased haemolysis and vaso-occlusion of sickle red cells. However, the clinical presentation of SCD patients is extremely variable and there are several events that may trigger vaso-occlusion[3]. Here we reported an interesting case of a 18 year old female presenting with 6 year history of intermittent musculoskeletal and multiple joint pain.

CASE REPORT

A 18 year old female presented with multiple intermittent joint pain of both limbs including small joints of hands, feet, elbow, ankle and knee with muscle ache of both upper and lower limbs with no aggravating factors and relieved on NSAID intake for the past 6 years. She had acute worsening of pain for the past 7 days.

Patient was evaluated multiple times in the past for inflammatory arthritis and the markers were negative. There was no history of prior blood transfusions. No history of similar illness in the family. General examination revealed pallor, tenderness of multiple joints including small joints of hands sparing distal interphalangeal joints, feet, elbow, ankle and knee and muscle tenderness involving both upper and lower limbs. Systemic examination was normal. Further investigations revealed low hemoglobin, reduced RBC count and normal mean corpuscular volume. Renal parameters were normal.

Liver function tests revealed indirect hyperbilirubinemia with normal liver enzyme values. Lactate dehydrogenase was elevated. Serology testing for HIV, HBSAg, HCV and VDRL was done which were negative. Rheumatoid factor and anti streptolysin O titres were done which were negative. X-ray of both hands and feet were taken which was normal. Ultrasonography of the abdomen was done

and spleen could not be visualized; CT abdomen as done which confirmed the absence of spleen.

Peripheral smear (Figure 1) revealed sickle cells and addition of sodium metabisulfite produced sickling of RBCs within 1 h of administration. High performance liquid chromatography (HPLC) was done which revealed HBs of 74%. Patient was started on IV fluids, analgesics and other supportive measures. In view of sickling crisis, patient was shifted to intensive care unit and exchange transfusion of 1200 ml of packed cell RBC was done. Post transfusion Hbs was 19%. Patient's symptoms started improving and patient was started on hydroxyurea 500 mg twice daily. Repeat investigations showed Hb of 8.8 g/dl and normal bilirubin and LDH levels. Repeat blood transfusions were done to achieve a target Hb of 10 g/dl and Hb on discharge was 10.4 g/dl. Screening of family members were advised.

Vaccination for capsulated organisms including meningococcus, hemophilus influenza and pneumococcus was done. Patient was discharged and is currently in continuos follow up.

Table 1: Serial measurements of hemogram and liver function test.

Investigation	On admission	Post exchange transfusion
Hemoglobin (g/dl)	7.4	8.8
Red blood cell count (million/mm^3)	2.54	3.03
Packed cell volume (%)	21.9	26.5
Mean corpuscular volume (fl)	86.2	87.5
Mean corpuscular hemoglobin (pg)	29.1	29
Mean corpuscular hemoglobin concentration (g/dl)	33.8	33.2
Platelet count (lakhs/mm^3)	4.47	4.23
Total leucocyte count (cells/mm^3)	23870	20330
Erythrocyte sedimentation rate	42	
Lactate dehydrogenase	496	140
Reticulocyte count (%)	2.5	
Total bilirubin (mg/dl)	4.2	1.2
Indirect bilirubin (mg/dl)	3.5	0.6
High performance liquid chromatography (%)	74	19

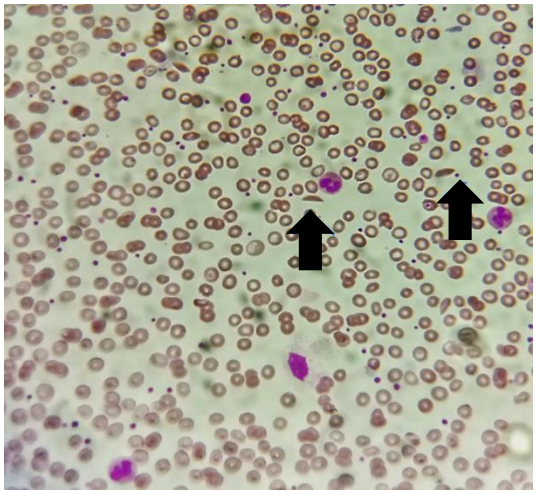

Figure 1: Peripheral smear revealing sickle cells and increase in WBC with neutrophilic.

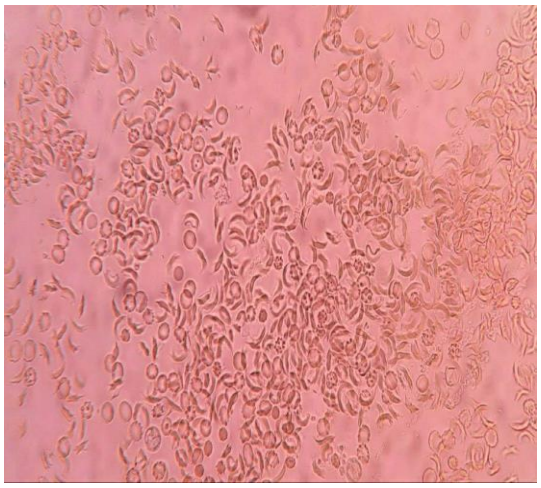

Figure 2: Peripheral smear with positive sodium metabisulfite sickling test.

DISCUSSION

Review of literature has shown the importance of red cell dehydration, abnormal adhesion of RBCs to the vascular endothelium, inflammatory events, and activation of all the cells in the vessel and abnormalities of nitric oxide metabolism in the pathophysiology of this disease. It involves multiple organs with musculoskeletal system being the most common site. In SCD, patients develop acute bone infarcts with localized pain, swelling, erythema and tenderness but articular involvement is not an initial finding.[4] Rheumatoid arthritis is an inflammatory disease affecting predominantly small joints of hand, feet and occasionally large joints. The joint involvement in RA is symmetrical and typically spares the distal interphalangeal joint. Small joints are typically affected by RA, like in this instance, while major joints like the knee are more likely to experience the musculoskeletal difficulties of Sickle cell disease.[5] Sickle cell-related inflammatory arthritis is typically acute, short-lived, and most likely connected to ischemia. When symptoms are persistent, include

numerous tiny joints, and progress to joint erosions or deformities, RA must be suspected.[6]

A prospective analysis of all sickle cell disease admissions to a private paediatric facility in Bardoli, Gujarat, was undertaken in 2015 by Patel et al. 654 patients had between one and seven admissions, accounting for 914 admissions. 763 (83%) hospitalizations were due to the bone pain crisis.[7] In 264 sickle cell anaemia patients who were followed up for 5 years, Darbari et al conducted a cohort study. Analysis of the data revealed that severe painful vaso-occlusive crisis events continue to be a marker for the severity of SCA disease and early mortality in a contemporary cohort, along with other known risk factors for death like high tricuspid regurgitant jet velocity, high ferritin, and lower renal function. An readily obtained result that could aid in the identification of high-risk patients for disease-modifying medications is the number of patient-reported pain crises requiring healthcare utilization.[8]

A meta-analysis by Dharshana et al concluded that further evidence-based evaluations and therapies would be more beneficial for South Asian patients with SCD than hydroxyurea and transfusion therapy. Fixed-low dose hydroxyurea treatment (10 mg/kg/day) has shown encouraging outcomes in Indian SCD patients and may be appropriate for sickle patients from other South Asian nations who are of Indian descent.[9] Ataga et al conducted a randomized controlled trial of 198 sickle cell anemia patients and compared the efficacy of crizanlizumab with placebo and found that crizanlizumab therapy resulted in a significantly lower rate of sickle cell-related pain crises than placebo and was associated with a low incidence of adverse events.[10]

It could be a potential treatment option for our patient for the prevention of further episodes of vaso-occlusive crisis. RA closely mimics the symptoms caused by bone crisis in sickle cell anemia but an acute onset of presentation and the involvement of large joints and other sites of vaso-occlusive crisis including autosplenectomy goes more in favour of sickle cell crisis than RA.

CONCLUSION

Sickle cell anemia is a disease with varying presentations and can involve multiple organs. Diagnosis of sickle cell anemia becomes important as musculoskeletal manifestations of the disease can mirror the symptoms of inflammatory arthritis and the treatment given for rheumatoid arthritis including DMARDS such as methotrexate and steroids can potentially worsen the condition in patients with sickle cell anemia.

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REFERENCES

1. Bhatia HM, Rao VR. Genetic atlas of the Indian tribes. Bombay: ICMR; 1987.
2. Bunn HF. Pathogenesis and treatment of sickle cell disease. N Engl J Med. 1997;337(11):762-9.
3. Odièvre MH, Verger E, Silva-Pinto AC, Elion J. Pathophysiological insights in sickle cell disease. Indian J Med Res. 2011;134(4):532-7.
4. Neumayr LD, Aguilar C, Earles AN, Jergesen HE, Haberkern CM, Kammen BF, et al. Physical therapy alone compared with core decompression and physical therapy for femoral head osteonecrosis in sickle cell disease. Results of a multicenter study at a mean of three years after treatment. J Bone Joint Surg Am. 2006;88(12):2573-82.
5. Espinoza LR, Spilberg I, Osterland CK. Joint manifestations of sickle cell disease. Medicine (Baltimore). 1974;53(4):295-305.
6. Michel M, Habibi A, Godeau B, Bachir D, Lahary A, Galacteros F, et al. Characteristics and outcome of connective tissue diseases in patients with sickle-cell disease: report of 30 cases. Semin Arthritis Rheum. 2008;38(3):228-40.
7. Patel J, Patel B, Serjeant GR. The Bone Pain Crisis of Sickle Cell Disease and Malaria: Observations from Gujarat, India. Indian J Community Med. 2017;42(3):167-9.
8. Darbari DS, Wang Z, Kwak M, Hildesheim M, Nichols J, Allen D, et al. Severe painful vaso-occlusive crises and mortality in a contemporary adult sickle cell anemia cohort study. PLoS One. 2013;8(11):e79923.
9. Darshana T, Rees D, Premawardhena A. Hydroxyurea and blood transfusion therapy for Sickle cell disease in South Asia: inconsistent treatment of a neglected disease. Orphanet J Rare Dis. 2021;16(1):148.
10. Ataga KI, Kutlar A, Kanter J, Liles D, Cancado R, Friedrisch J, et al. Crizanlizumab for the Prevention of Pain Crises in Sickle Cell Disease. N Engl J Med. 2017;376(5):429-39.

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