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Sulfasalazine Induced Bone Marrow Suppression: A Case Report

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ABSTRACT:

Sulfasalazine is an anti-inflammatory drug commonly used in the treatment of autoimmune diseases such as rheumatoid arthritis, ulcerative colitis, and Crohn's disease. It works by reducing inflammation in the body, but it has a range of potential side effects, one of which is bone marrow suppression. Bone marrow suppression occurs when the bone marrow, responsible for producing blood cells, is inhibited, leading to reduced levels of red blood cells, white blood cells, and platelets. This can result in conditions such as anemia, leukopenia, and thrombocytopenia, which can cause fatigue, increased infection risk, and easy bruising or bleeding. It can be caused by various factors, including drug therapy, infections, and underlying diseases. This case report presents a 23 year old female patient present with complaints of intermittent low graded fever for 1 week associated with tiredness and cough. She had a history of intake of Sulfasalazine two weeks back for right shoulder pain and resulted In Bone marrow suppression.

Keywords: Sulfasalazine, bone marrow suppression, anemia, leukopenia, thrombocytopenia.

INTRODUCTION:

Sulfasalazine is a widely used anti-inflammatory drug that is primarily prescribed for the treatment of autoimmune diseases such as rheumatoid arthritis, ulcerative colitis, and Crohn's disease [1]. It is a combination of sulfapyridine and 5-aminosalicylic acid (5-ASA), which work together to reduce inflammation in the gastrointestinal tract and joints. Despite its efficacy in treating these conditions, sulfasalazine is associated with a range of potential side effects. One of the most significant and potentially serious adverse effects is bone marrow suppression [2].

Bone marrow suppression occurs when the bone marrow's ability to produce blood cells is impaired, resulting in a decrease in red blood cells, white blood cells, and platelets [3]. This reduction in blood cell production can lead to conditions such as anemia, leukopenia, and thrombocytopenia, which can present clinically as fatigue, increased susceptibility to infections, and easy bruising or bleeding. Though rare, sulfasalazine-induced bone marrow suppression has been documented in clinical studies, highlighting the importance of recognizing and managing this complication early to prevent severe outcomes [4].

Sulfasalazine is metabolized in the body to its active component, 5-ASA, which can interfere with DNA synthesis and cellular replication within the bone marrow. This inhibition disrupts the normal production of blood cells (erythrocytes, leukocytes, and thrombocytes) [5]. The suppression of white blood cells, specifically neutrophils, can lead to neutropenia, increasing the risk of infection. Reduced platelet production can result in thrombocytopenia, leading to a higher risk of bleeding or bruising. Anemia occurs when there are insufficient red blood cells to carry oxygen throughout the body, causing symptoms like fatigue and pallor [6].

Symptoms of sulfasalazine-induced bone marrow suppression typically include fatigue, low-grade fever, easy bruising or bleeding, recurrent infections, pallor, and cough. Fatigue and pallor are primarily due to anemia, while bruising and bleeding are caused by thrombocytopenia, or low platelet count. Leukopenia, or a reduction in white blood cells, increases the risk of infections [7].

Diagnosis is based on clinical presentation and laboratory findings, particularly a complete blood count (CBC) showing reduced white blood cells (leukopenia), platelets (thrombocytopenia), and red blood cells (anemia). Other causes of bone marrow suppression, such as infections or other medications, must be excluded through additional tests [8].

Treatment involves discontinuing sulfasalazine immediately to prevent further bone marrow suppression. Supportive care may include blood transfusions for anemia or thrombocytopenia, antibiotics to prevent or treat infections, and monitoring of blood counts

until recovery occurs. Once blood cell counts stabilize, alternative treatments for the underlying autoimmune condition should be considered, prioritizing medications that do not carry the same risk of bone marrow suppression. Regular monitoring and early intervention are crucial to prevent severe complications [9,10].

CASE REPORT:

This case report presents a 23 year old female patient present with complaints of intermittent low graded fever for 1 week associated with tiredness and cough. She had a history of intake of Sulfasalazine two weeks back for right shoulder pain. General examination revealed conscious, afebrile and oriented.

Table 1: Hemotological Investigations on hospital stay

PARAMETER	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Hemoglobin	7.0 gm/dL	7.4 gm/dL	7.5 gm/dL	8 gm/dL	8.4gm/dL
Platelet count	1.34 lakhs/cumm	1.6 lakhs/cumm	3.4 lakhs/cumm	4.23 lakhs/cumm	5.07 lakhs/cumm
Total count	600 cells/cumm	640 cells/cumm	870 cells/cumm	21950 cells/cumm	5150 cells/cumm
Absolute neutrophil count	300 cells/cumm	700 cells/ cumm	2080	12870 cells/cumm	18330 cells/cumm
Hematocrit	20.2%	23.7%	23.7%	24.7%	25.1%
Red cell distribution width (RDW)	13.5%	14.0%	14.6%	14.9%	15.3%

Lab investigations report revealed Pancytopenia – microcytsic hypochromic anemia, severe neutropenia, moderate thrombocytopenia, and raised inflammatory markers. Bone marrow aspiration smear showed dilute bone marrow aspirate and inprint smears showing predominantly erythroid precursors and lymphoid cells. The Medication Sulfasalzine which was taken for 2 weeks that resulted in Bone marrow suppression. So the drug was stopped. The adverse drug reaction probability was checked by using Naranjo scale and the score obtained was 7.

Patient was treated with INJ. TEICOPLANIN, 400mg, INJ. MEROPENEM, 1gm, INJ. CASPOFUNGIN, 50mg, INJ. PANTOPRAZOLE, 40mg, INJ, TRANEXAMIC ACID, 500mg, INJ. PARACETAMOL, 1gm, INJ. FILGRASTIM, 300 mcg, T. DOXYCYLCINE, 100mg, T. ACYCLOVIR, 400mg, T. POSACONAZOLE, 300mg. on 5ht day patient was symptomatically better and discharged with T. BENFOTIAMINE, 100mg, T. FOLIC ACID, 5mg, T. ASCORBIC ACID, 500mg. on 5th day patient was symptomatically better and discharged with T. BENFOTIAMINE, 100mg, T. FOLIC ACID, 5ng, T. VITAMIN C, 500mg.

DISCUSSION:

Sulfasalazine, a commonly used disease-modifying antirheumatic drug (DMARD), is effective in managing inflammatory conditions but can lead to rare yet serious adverse effects. Pancytopenia, resulting from bone marrow suppression, is a potentially life-threatening complication. Early detection through regular blood monitoring is essential. Prompt discontinuation of sulfasalazine upon signs of hematological toxicity can prevent severe outcomes. Clinicians must remain vigilant and consider alternative therapies when necessary to ensure patient safety and effective disease management [10].

Marsia, Samar Mahmood *et al* presented a rare case of Sulfasalazine-Induced Pancytopenia Indicating Bone Marrow Suppression. In this case a five-year-old boy diagnosed with juvenile idiopathic arthritis (JIA) developed pancytopenia after being treated with sulfasalazine. Previous studies have shown that sulfasalazine-induced pancytopenia is caused by bone marrow suppression. Although a bone marrow biopsy of the patient could not be performed due to the changing hematological profiles with the change in medicines, the pancytopenia in this patient, along with the onset of the symptoms of bone marrow suppression being immediately associated with the intake of sulfasalazine and alleviating shortly after the withdrawal of the drug on two occasions, were all factors indicative of bone marrow suppression induced by the drug itself. The patient's blood counts normalized upon discontinuation of the drug, and pancytopenia recurred when sulfasalazine was reintroduced, strongly implicating the medication as the cause of bone marrow suppression [11].

Abdulrahman S Alanazi et al presented a case of Sulfasalazine-Induced Pancytopenia Indicative of Bone Marrow Suppression. In this case a 18-year-old Saudi woman diagnosed with ulcerative colitis. She was initially treated with azathioprine, sulfasalazine, and prednisolone. After two months, she developed pancytopenia. Despite stopping azathioprine and prednisolone, her blood counts

remained low until sulfasalazine was discontinued. Reintroduction of sulfasalazine led to a rapid decline in hematological parameters, confirming sulfasalazine-induced bone marrow suppression [12].

In our case, the disease was diagnosed by Lab investigations report that revealed Pancytopenia – microcytsic hypochromic anemia, severe neutropenia, moderate thrombocytopenia, and raised inflammatory markers. Bone marrow aspiration smear showed dilute bone marrow aspirate and inprint smears showing predominantly erythroid precursors and lymphoid cells. Patient was treated with IV antibiotics, GCSF and other supportive measures.

CONCLUSION:

Sulfasalazine-induced bone marrow suppression, though rare, is a serious and potentially life-threatening adverse effect that requires careful monitoring. Pancytopenia resulting from bone marrow toxicity can have severe consequences if not promptly identified and managed. This case emphasizes the importance of regular blood count monitoring, especially during the early stages of treatment, to detect hematological abnormalities. Clinicians should maintain a high index of suspicion and discontinue sulfasalazine immediately if bone marrow suppression is suspected. Alternative therapies should be considered for at-risk patients.

REFERENCES:

1. Marsia S, Mahmood S, Raza M, Nusrat K, Saleem A. Sulfasalazine-induced pancytopenia indicating bone marrow suppression: a rare pediatric case report from Pakistan. Cureus. 2019;11(4):e4462.
2. Alanazi AS. Sulfasalazine-induced pancytopenia indicative of bone marrow suppression: a case report. J Med Cases. 2014;5(5):281-284.
3. Ek S, Rosenborg S. Mesalazine as a cause of fetal anemia and hydrops fetalis: a case report. Medicine (Baltimore). 2017;96(50):e9277.
4. Taggart AJ. Sulphasalazine in arthritis—an old drug rediscovered. Ir J Med Sci. 1988;157(6):186-189.
5. Fujikawa S, Okuni M. Clinical analysis of 570 cases with juvenile rheumatoid arthritis: results of a nationwide retrospective survey in Japan. Acta Paediatr Jpn. 1997;39(2):245-249.
6. Van Rossum MA, Fiselier TJ, Franssen MJ, et al. Sulfasalazine in the treatment of juvenile chronic arthritis: a randomized, double-blind, placebo-controlled, multicenter study. Arthritis Rheum. 998;41(5):808-816.
7. Sutherland L, Macdonald JK. Oral 5-aminosalicylic acid for induction of remission in ulcerative colitis. Cochrane Database Syst Rev. 2006;(2):CD000543.
8. Solberg IC, Lygren I, Jahnsen J, et al. Clinical course during the first 10 years of ulcerative colitis: results from a population-based inception cohort (IBSEN Study). Scand J Gastroenterol. 2009;44(4):431-440.
9. Jick H, Derby LE, Myers MW, Vasilakis C, Jick SS. Liver disease associated with sulfasalazine and mesalazine in general practice in the United Kingdom. Gut. 1999;44(6):825-829.
10. Tett SE. Clinical pharmacokinetics of slow-acting antirheumatic drugs. Clin Pharmacokinet. 1993;25(5):392-407.
11. Rains CP, Noble S, Faulds D. Sulfasalazine: a review of its pharmacological properties and therapeutic efficacy in the treatment of rheumatoid arthritis. Drugs. 1995;50(1):137-156.
12. Marsia S, Mahmood S, Raza M, Nusrat K, Saleem A. Sulfasalazine-induced pancytopenia indicating bone marrow suppression: a rare pediatric case report from Pakistan. Cureus. 2019;11(4):e4462.
13. Alanazi AS. Sulfasalazine-induced pancytopenia indicative of bone marrow suppression: a case report. J Med Cases. 2014;5(5):281-284.

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Conflict of Interest Statement: All authors have nothing else to disclose.

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