

## Dapsone-Induced Hemolytic Anemia in a Patient with Hansen's Disease Under Multidrug Therapy: A Case Report

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**ABSTRACT:** Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*, commonly treated with multidrug therapy (MDT) including Dapsone, rifampicin, and clofazimine. Although effective, dapsone is associated with serious adverse effects such as hemolytic anemia, particularly in susceptible individuals. We report a case of a 38-year-old male diagnosed with borderline lepromatous leprosy who developed acute hemolytic anemia following initiation of MDT. The patient presented with fatigue, jaundice, and dark-colored urine after 3 weeks of therapy. Laboratory findings confirmed hemolysis. Dapsone was discontinued, and the patient was managed with supportive therapy and modification of MDT. Clinical improvement was observed with stabilization of hemoglobin levels.

This case highlights the importance of early recognition of ADRs and the role of clinical pharmacists in monitoring and managing drug-induced complications.

**KEYWORDS:** Leprosy, Dapsone, Hemolytic anemia, Adverse drug reaction, Multidrug therapy.

### I. INTRODUCTION

Leprosy remains a significant public health issue in endemic countries such as India. The World Health Organization recommends multidrug therapy (MDT) for effective management and prevention of resistance [1]. Leprosy continues to be a major public health concern in endemic regions, with India contributing a significant proportion of global cases despite ongoing elimination efforts [1]. Multidrug therapy (MDT) has markedly reduced disease burden and transmission; however, long-term drug exposure increases the risk of adverse drug reactions that

may affect treatment adherence and outcomes [1,2].

Dapsone is a key component of MDT due to its bacteriostatic action against *Mycobacterium leprae*. However, it is associated with adverse effects such as hemolytic anemia, methemoglobinemia, and hypersensitivity reactions [2].

Hemolysis occurs due to oxidative stress on red blood cells and may be more severe in patients with Glucose-6-phosphate dehydrogenase deficiency [3]. Early detection and management of such reactions are essential components of effective leprosy control programs [3]. Leprosy primarily affects the skin and peripheral nerves, leading to progressive disability if not treated early. Despite effective therapy, delayed diagnosis and complications related to treatment continue to contribute to disease burden and morbidity in affected populations [4].

Adverse drug reactions (ADRs) associated with MDT are an important concern, as they may lead to poor adherence, treatment interruption, or modification of standard regimens. Early identification and management of ADRs are therefore essential to ensure successful treatment outcomes and prevent long-term complications [2,5].

Among the hematological adverse effects, dapsone-induced hemolytic anemia is particularly significant due to its potential severity. Routine monitoring and patient education play a crucial role in minimizing risks and ensuring safe continuation of therapy [3,5].

## II. CASE PRESENTATION

A 38-year-old male with no significant past medical history presented to the dermatology outpatient department with complaints of hypopigmented, anesthetic skin patches over the upper limbs and trunk, associated with mild sensory loss and peripheral nerve thickening. Based on clinical examination and slit-skin smear findings, he was diagnosed with borderline lepromatous Leprosy and initiated on standard multidrug therapy (MDT) comprising rifampicin, clofazimine, and Dapsone as per World Health Organization guidelines.

After approximately three weeks of therapy, the patient presented to the emergency department with complaints of generalized weakness, fatigue, yellowish discoloration of the eyes, and dark-colored urine. On examination, he appeared pale and icteric, with mild tachycardia but was hemodynamically stable. There was no history of bleeding, drug overdose, or prior similar episodes.

Initial laboratory investigations revealed a significant drop in hemoglobin to 7.8 g/dL from a baseline of 12.5 g/dL. Further evaluation showed elevated reticulocyte count, increased indirect bilirubin, and raised lactate dehydrogenase levels, suggestive of ongoing hemolysis. Peripheral blood smear demonstrated features consistent with hemolytic anemia. Renal and liver function tests were within acceptable limits, and no alternative cause of anemia was identified. Screening for Glucose-6-phosphate dehydrogenase deficiency was not suggestive of deficiency.

In view of the temporal association with MDT initiation and laboratory findings, dapsone-induced hemolytic anemia was suspected. Dapsone was immediately discontinued, while rifampicin and clofazimine were continued as part of a modified regimen. The patient received supportive management, including transfusion of one unit of packed red blood cells and folic acid supplementation.

Therapeutic monitoring was carried out through serial hemoglobin and biochemical assessments. Over the next 7–10 days, the patient demonstrated gradual clinical improvement. Symptoms such as fatigue and jaundice resolved,

and hemoglobin levels improved to 10.5 g/dL. No further hemolytic episodes were observed following discontinuation of dapsone.

The patient was subsequently discharged in stable condition with advice for regular follow-up and continued modified MDT.

## III. DISCUSSION

Leprosy remains a significant public health concern in endemic regions, and although multidrug therapy (MDT) has markedly improved disease control, adverse drug reactions can affect treatment adherence and outcomes [1,2]. Dapsone, a key component of MDT, is associated with dose-dependent oxidative hemolysis due to red blood cell membrane damage. This effect is more pronounced in patients with Glucose-6-phosphate dehydrogenase deficiency, although it may also occur in individuals with normal enzyme activity [3,4].

Clinically, dapsone-induced hemolytic anemia presents with fatigue, jaundice, and dark urine, supported by laboratory evidence of hemolysis. Early recognition and prompt discontinuation of the offending drug are essential to prevent complications. Supportive management and modification of MDT ensure continued treatment while minimizing toxicity. This case underscores the importance of routine monitoring and pharmacovigilance in improving patient safety and therapeutic outcomes.

## IV. CONCLUSION

Dapsone-induced hemolytic anemia is a clinically significant adverse effect that can occur during multidrug therapy for Leprosy. Early recognition of symptoms and prompt discontinuation of the offending drug are essential to prevent severe complications.

Regular hematological monitoring and timely intervention, along with appropriate modification of therapy, can ensure safe and effective disease management. This case highlights the importance of pharmacovigilance and the role of healthcare professionals in optimizing patient outcomes.

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