

## Drug-induced hemolysis due to ceftriaxone: a case report of rare adverse reaction

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### ABSTRACT

Ceftriaxone, a third generation cephalosporin is the commonest antibiotic of choice in any tertiary care hospital. Drug-induced Immune hemolytic anemia is uncommon adverse effect of ceftriaxone. A 52 year old diabetic woman presented to surgical outpatient department with fever and cellulitis of left foot since one week. Patient was started on intravenous ceftriaxone, 1 gram 12 hourly. She complained of chest pain, breathlessness, rash, chills and peri-oral tingling sensation. Her hemoglobin was dropped down to 8.2 g/dl within 24 hours. Peripheral smear showed marked polychromasia, nucleated RBC's,

schistocytes and neutrophilia. A diagnosis of ceftriaxone induced hemolysis was made and the drug was stopped immediately. Dexamethasone was given and intravenous ciprofloxacin was started. Three units of packed cells were transfused and her hemoglobin increased to 10.4 g/dl, at the time of discharge, ten days later. Ceftriaxone-induced hemolysis is a rare, sometimes fatal adverse reaction and the physicians should be aware of it and be vigilant while prescribing this drug.

**Key words:** Ceftriaxone, Hemolysis, Adverse reaction

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### INTRODUCTION

Ceftriaxone, a third generation cephalosporin is the commonest antibiotic of choice in any tertiary care hospital.<sup>1</sup> Drug-induced Immune hemolytic anemia is uncommon adverse effect of ceftriaxone. We describe one such case.

### CASE REPORT

A 52 year old woman presented to surgical outpatient department with fever and cellulitis of left foot since one week. She was diabetic since five years and was

on metformin. She had no history of any drug allergies. Clinically she had fever and cellulitis of left foot extending up to ankle joint. On admission, basic investigations were done and findings are shown in table 1.

A diagnosis of diabetes with cellulitis of left foot was made and patient was started on intravenous ceftriaxone, 1 gram 12 hourly and the Internal medicine department was called for diabetic management. Immediately after the first dose of ceftriaxone, she complained of chest pain, breathlessness, rash, chills

**Table 1. Laboratory parameters on admission and 24 hours later**

Investigation	Results (admission time)	Results (24 hours later)
Hemoglobin	11.5 g / dl	8.2 g/ dl
Total WBC count	13,400 cells/ cu.mm.	12,800 cells / cu.mm.
Neutrophils	86%	85%
Lymphocytes	10%	12%
Monocytes	02%	03%
Eosinophils	02%	00%
Platelet count	2.4 lakhs/cu.mm	3.0 lakhs/cu.mm
ESR	86 mm/ 1 hour.	---
Random blood sugar	320 mg/ dl	260 mg/dl
Blood urea	30 mg/ dl	36 mg/dl
Serum creatinine	1.0 mg/dl	1.2 mg/dl

and peri-oral tingling sensation. Drug (ceftriaxone) induced adverse reaction was considered and intravenous dexamethasone was administered. Her hemoglobin was dropped down to 8.2 g/dl within 24 hours and further 6.9 g/dl after three days. Peripheral smear showed marked polychromasia, nucleated RBC's, schistocytes and neutrophilia. Reticulocyte count was 4.6% with raised serum bilirubin and LDH [Table 2].

**Table 2. Laboratory evidence of hemolysis (24 hours later)**

Investigations	Result (24 hours later)
Reticulocyte count	4.6 %
LDH	1274 units /L
Serum bilirubin	2.3 mg/dl
Indirect bilirubin	1.7 mg/dl
Peripheral Smear	Polychromasia nucleated RBC's and schistocytes

Direct Coombs test was positive. A diagnosis of ceftriaxone induced hemolysis was made and the drug was stopped immediately and intravenous ciprofloxacin was started. Three units of packed cells were transfused and her hemoglobin increased to 10.4 g/dl at the time of discharge, ten days later. Bilirubin normalized on day eight, cellulitis decreased and blood sugar was under control.

## DISCUSSION

Ceftriaxone is the most commonly prescribed antibiotic in all specialties for various conditions.<sup>1</sup>

The most common adverse reactions associated with ceftriaxone administration are urticaria, rash, exanthema and pruritus.<sup>2</sup> Other adverse reactions include elevation of liver enzyme levels, diarrhea, leucopenia and hypersensitivity reactions. Stevens-Johnson syndrome, agranulocytosis, allergic pneumonitis, anaphylaxis, biliary lithiasis, colitis, seizures, serum sickness and hemolysis are some of the rare and fatal complications associated with ceftriaxone administration.<sup>3</sup> The first case of ceftriaxone-induced hemolysis was reported in 1991 by Garratty *et al.*<sup>4</sup> Ceftriaxone induced hemolysis is due to presence of either IgG or IgM antibodies in the patient's serum. Ceftriaxone attaches to RBC, but do not bind covalently to RBC membrane. Combination of drug and antibody creates an immunogen, which activates complement and results in acute intravascular hemolysis.<sup>4,5</sup>

Ceftriaxone induced hemolysis, is a rare entity and can be life threatening if not thought of. Sudden drop in hemoglobin, hemolysis evidenced by peripheral smear and hemoglobinuria should be watched carefully among patients treated with ceftriaxone. Other Cephalosporin drugs should be used with caution in patients who develop adverse effects to Ceftriaxone because of cross reactivity.<sup>6</sup> Treatment includes immediately stopping of the drug and symptomatic management. In our case, the patient improved after stopping the drug. To conclude, ceftriaxone-induced hemolysis is a rare, sometimes fatal adverse reaction and the physicians should be aware of it and be vigilant while prescribing this drug.

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