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Research Article

CASE REPORT ON CEFTRIAXONE INDUCED RASH DERMATITIS IN PATIENT WITH CHRONIC LIVER DISEASE

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A R T I C L E I N F O

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A B S T R A C T

Ceftriaxone is a third-generation cephalosporin that was approved for use in the US in 1984 and is still widely used today. Ceftriaxone is available in different brands, which is available in a parenteral formulation. It is indicated for the treatment of moderate-to-severe bacterial infections caused by susceptible organisms and can be given intravenously or intramuscularly. A 58 year old male patient has been admitted in the hospital on 28-DEC-2021, with existing complaints of Altered behavior, decreased appetite, melena and ecchymosis. Based on the lab investigations and physical examination, patient had a definitive diagnosis reported as "Decompensated chronic liver disease With portal hypertension and Hepatic encephalopathy". Upon administration of Ciftriaxone at a dose of 1gram- intravenously, the patient has developed erythematic rash over the chest. The severity of ADR was assessed using Modified Hartwig and Siegel Severity Scale, by which the severity of this ADR stands at level 3 Moderate ADR, as the ADR was well managed by suspect product withheld, discontinued or use of antidote or alternative treatment. We conclude that to avoid drug-induced difficulties in a patient, we should always monitor the prescription with drug relevant problems (DRP's). Particularly in patients who have other chronic problems such as liver disease or high blood pressure. This prescription monitoring will ensure that we provide the safest and most effective treatment at the lowest possible cost.

INTRODUCTION

Ceftriaxone is a third-generation cephalosporin that was approved for use in the US in 1984 and is still widely used today [1]. Ceftriaxone is available in different brands, which is available in a parenteral formulation. It is indicated for the treatment of moderate-to-severe bacterial infections caused by susceptible organisms and can be given intravenously or intramuscularly[2]. Adults typically receive 1 to 2 grammes IM or IV in one or two divided doses daily for 7 to 14 days as treatment or prophylaxis [3]. Parenteral cephalosporins are commonly used in medicine to treat serious infections and can be safely administered to patients with advanced liver disease, with dose adjustments needed only in cases of renal insufficiency. Ceftriaxone is also safe for children to use [4, 5].

Adverse effects

Ceftriaxone is generally well tolerated, with diarrhoea, nausea, stomach pain, dyspepsia, headache, and rash being the most common side effects [6]. Clostridium difficile-associated diarrhoea, hypersensitivity responses, angioedema, anaphylaxis, and Stevens Johnson syndrome/toxic epidermal necrolysis are all rare but potentially serious side effects [7].

CASE REPORT

A 58 year old male patient has been admitted in the hospital on 28-DEC-2021, with existing complaints of Altered behavior, decreased appetite, melena and ecchymosis. Patient's medical history included, Alcoholic liver disease with 40 years of alcohol consumption known. Known history of portal hypertension with non-compliance to anti-hypertensive medication was reported. Patient had no known drug or non-drug allergies, had normal appetite in regular with slightly altered sleep patterns and mixed diet habit.

On examination, patient looked pale, which was due to decreased food intake, no other symptoms of infection present, afebrile, no any signs of inflammation over body, Abdominal examination was palpable and soft on the day of admission. Patient had altered sensorium. Lab investigations were ran, vitals were observed to be as, PR- 98/min, BP- 130/90 mm of Hg, SPO_2 – 98%, CVS- S_1S_2 +, ECG – Inferior T-Wave abnormality is nonspecific, Albumin – 1.94 gm%. Prothrombin time was also altered, which represents coagulation abnormalities if present.

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DISCUSSION

The albumin levels were observed to be lower than normal levels, where 3.4 to 5.4 g/dL, is the normal range to be present. Based on the lab investigations and physical examination, patient had a definitive diagnosis reported as "Decompensated chronic liver disease With portal hypertension and Hepatic encephalopathy".

Patient's therapeutic approach included with day 1 of IVF-25% Dextrose (Intravenous fluids), as dietary supplement, Syrup- Oral lactulose 10ml – P/O – TID, to treat constipation, Injection. Ceftriaxone 1gm-IV-BD, indicated as antibiotic prophylaxis, Injection. Pantoprazole 40mg-IV-OD, indicated as prophylaxis and abdominal soothing effect, Tablet. Ademetionine 400 mg – P/O-OD, which was indicated for liver disease, Propranolol hydrochloride long acting tablet was given at a dose of 40 mg-OD, for managing hypertension, Injection Vitamin K was given for treating coagulopathy (which was observed out of altered prothrombin time), Enema was prescribed to use if required (on severe constipation or any obstruction noted for bowel movement complicated).

ADR

Upon administration of Ciftriaxone at a dose of 1gram-intravenously, the patient has developed erythematic rash over the chest, as shown in Picture 1. With known adverse effects of Ceftriaxone to cause maculopapular rash or rash with eosinophilia reported previously [8], ceftriaxone was found to be suspect and withdrawn it immediately.

Management of ADR

Patient was administered with Rifaximin at a dose of 350 mg, continued to be used twice a day as an alternative for ceftriaxone. The rash seems to be fading and the patient never after shown the symptoms of erythema or rash over the period of admission. Thus, Ceftriaxone was proven to have casual relationship with "RASH".

Picture 1 Showing ADR/Patient condition

Probablity Assessment of ADR

Probability is the likeliness of a suspect to cause an event. Here, in this case, the probability of Ceftriaxone to cause Rash, was assessed by using approved Naranjo's scale. Naranjo's scale was evaluated and observed that the probability of ceftriaxone-Rash, stood at a level of **"7 Points"** out of 9 points. The scores and observations are well represented in the Table 1.

Table 1 Probability Assessment ByNaranjo's Scale

S.No.	Questions	Yes	No	Don't know	Score
1.	Are there previous conclusion reports on this reaction?	+1	0	0	+1
2.	Did the adverse reaction appear after the suspected drug was administered?	+2	-1	0	0
3.	Did the adverse reaction improve when the drug was discontinued or a specific antagonist was administered?	+1	0	0	+1
4.	Did the adverse reaction re-appear when the drug was re-administered?	+2	-1	0	+2
5.	Are there alternative causes that could on their own have caused the reaction?	-1	+2	0	+2
6.	Did the reaction re-appear when a placebo was given?	-1	+1	0	0
7.	Was the drug detected in the blood (or other fluids) in concentrations known to be toxic?	+1	0	0	0
8.	Was the reaction more severe when the dose was increased or was less severe when the dose was decreased?	+1	0	0	0
9.	Did the patient have a similar reaction to the same or similar exposure?	+1	0	0	0
10.	Was the adverse event confirmed by any objective evidence?	+1	0	0	+1
	TOTAL SCORE				7

Severity of ADR

The severity of ADR was assessed using Modified Hartwig and Siegel Severity Scale, by which the severity of this ADR stands at level 3 Moderate ADR, as the ADR was well managed by suspect product withheld, discontinued or use of antidote or alternative treatment. And there was also no prolonged hospitalization or complication or irreversible complications like outcome of ADR, as recovered with *Sequelae* is not present.

CONCLUSION

We infer that ADR could have been feasible with an existing medical state of chronic liver disease, as the liver is a critical organ for any medicine to provide therapeutic activity. To avoid drug-induced difficulties in a patient, we should always monitor the prescription with drug relevant problems (DRP's). Particularly in patients who have other chronic problems such as liver disease or high blood pressure. This prescription monitoring will ensure that we provide the safest and most effective treatment at the lowest possible cost.

Abbrevations:
BD- Twice a day,
P/O- per oral,
TID – Trice a day,
IV – intravenous,
OD – once daily,
PR- Pulse rate,
BP – Blood pressure,
ADR – Adverse drug reaction,
S_1 – First heart sound,
S_2- Second heart sound,
CVS- Cardiovascular system,
ECG- *Electrocardiogram*.

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