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Management of life-threatening anaphylactic shock induced by Ceftriaxone following negative intradermal skin test in an Intensive Care Unit of a peripheral district hospital: a case report

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ABSTRACT

Introduction: Ceftriaxone is frequently used in the treatment of infectious diseases. Ceftriaxone-induced anaphylactic reactions are rare. But once Anaphylaxis occurs, it is severe, quickly progressive, and potentially fatal.

Case report: A 58-year-old female presented with abdominal pain for 3 days. Vital signs and physical exam were unremarkable. Investigation revealed an increase in total leukocyte count for which the patient was admitted to the ward and started on Ceftriaxone. After 5 minutes of IV ceftriaxone injection, the patient complained of difficulty in breathing, generalized body itching, and mild rash with hypotension and hypoxia. Following diagnosis of anaphylactic shock, immediate management with oxygen, injection Adrenaline, Hydrocortisone, Pheniramine maleate, IV crystalloid, and injection Noradrenaline infusion was given. The patient's clinical condition improved. She was weaned off after 48 hours and discharged.

Conclusion: Early recognition, timely action, vigilant supervision, and organized teamwork have a significant impact on patient outcomes for ceftriaxone-induced anaphylactic reactions.

Keywords: Anaphylaxis, Anesthesiologist, Ceftriaxone, Intensive Care Unit

INTRODUCTION

An allergy is an unfavorable reaction brought on by prior sensitization to a specific chemical [1]. Ceftriaxone is used frequently in treating infectious diseases [2]. Ceftriaxone-induced anaphylactic reactions are rare. But once anaphylaxis occurs, it is severe, quickly progressing, and potentially fatal [3]. The incidence of hypersensitive reactions associated with ceftriaxone ranges from 1 to 3%, while anaphylaxis occurs rarely (0.001 to 0.1%) [4]. Before administration of ceftriaxone, an intradermal skin test is done, which is quick, easy to use, and sensitive, but there is a greater chance of false positive and false negative results, which may be due to improper technique, co-occurring drugs, the patient's physiological state, and the skin test instrument used[5]. We report a case of Ceftriaxone-induced severe anaphylaxis resulting in anaphylactic shock, which might pose major challenges for physicians and anesthesiologists in its management.

CASE PRESENTATION

A 56-year-old female from Hetauda, Nepal presented in the ER with complaints of abdominal pain for 3 days. There were no other complaints. For three years, the patient was treated with Amlodipine 5 mg once a day for hypertension and Metformin 500 mg twice daily for Diabetes Mellitus. The patient had no prior history of allergies. The patient appeared agitated and in pain during the examination, but her vital signs were all within normal ranges. Intravenous access was secured, and blood was drawn for baseline investigation (Complete Blood Count(CBC), Renal Function Test(RFT), Liver Function Test(LFT) & serum amylase). Patient was managed with injection Hyoscine butylbromide 20 mg iv, Pantoprazole 40 mg iv given immediately and Syrup Antacid 15 ml po stat. Patients' reports, including Ultrasonography abdomen and pelvis, General Random Blood Sugar, Electrocardiogram, and Chest X-ray, were within normal range, except for a total leukocyte count of 16,000 cells/mm^3 and neutrophils of 88%. The patient was admitted to the medicine ward. On admission, the patient was kept on medication, injection Ceftriaxone 1 gm IV twice a day, injection Hyoscine butylbromide 20 mg IV three times a day, injection Pantoprazole 40 mg IV twice a day, syrup Aluminium hydroxide, Magnesium hydroxide, Calcium carbonate, Sodium bicarbonate 10 ml per oral three times a day, and injection Paracetamol 1 gm IV in as per required dose.

On admission to the ward, the patient's vitals were stable. Onward, a test dose of intravenous antibiotics, ceftriaxone, was given, and it was found that there was no sign of allergy; therefore, injection of ceftriaxone 1 gram was diluted in 100 mL of normal saline and given to the patient over 15 minutes. After five minutes of IV ceftriaxone injection, the patient complained of difficulty in breathing, generalized body itching, and a mild rash over the injection site. On examination, the patient was drowsy, had developed shortness of breath, and generalized facial swelling. On auscultation, there was diffuse wheeze. On examination of vitals, the patient had a feeble pulse with BP unrecordable and SPO2 of 60%. Her GRBS was 110 mg/dl.

The patient was immediately managed with high-flow oxygen at 15 L/min via a face mask, an injection of Adrenaline 0.5 mg IM, an infusion of Hydrocortisone 200 mg IV, an injection of Pheniramine maleate 2 ml (45.5 mg) IV, and an IV bolus of normal saline 500 ml. The patient was then promptly transferred to the Intensive Care Unit (ICU), where oxygen supplementation was continued at a rate of 15 liters per minute via a face mask to ensure her blood oxygen levels remained above 92%. Patient resuscitation was continued with IVF NS 500 ml fast with

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maintenance fluid of II-pint normal saline and II-pint RL for 24 hours. To alleviate wheeze and breathing difficulties, she received nebulization with a mixture of Salbutamol, Ipratropium, and Normal saline (in a ratio of 1:1:2). The Patient was on Noradrenaline at the rate of 0.01 mcg/kg/min to 0.1 mcg/kg/min in incremental doses. After 30 minutes of resuscitation, the patient's condition improved with GCS 14/15, Heart rate: 90 bpm, BP 110/50 mm Hg, SPO2 94% and RR 23 bpm. Her shortness of breath and wheeze subsided, while rashes and facial swelling also decreased. Her arterial blood gas (ABG) findings showed slight metabolic acidosis with hypoxemia.

A repeat chest X-ray demonstrated bilateral increased bronchovascular markings. Electrocardiography (ECG) showed only sinus tachycardia. Bedside lung scanning revealed a normal lung scan. Bedside echocardiography screening ruled out structural cardiac abnormalities. Additionally, bedside venous Doppler of the bilateral lower limbs was performed to exclude venous thromboembolism. The patient was kept Nil Per oral. And her medication was updated, which included broad-spectrum antibiotics (Piperacillin 4 gm + Tazobactam 0.5 gm) along with a prophylactic dose of subcutaneous Enoxaparin (40 units), IV Hydrocortisone (100 mg three times daily), and IV pheniramine maleate 2 ml (45.5 mg). Close monitoring of vital signs, fluid intake, and urinary output was initiated. ICU staff were advised to continue oxygen and Noradrenaline and taper as required, with a target SPO2 of more than 92% and BP of 100/60 mmHg. The patient's response to treatment was carefully tracked through daily Laboratory investigations (Table 1).

Table 1: Investigations of the patient during the course of hospital stay

Investigations	Day of admission	1st DOA	2nd DOA	Discharge
Hb (gm%)	11	10.4	10.6	11.2
Platelet count(/cumm)	2,53,000	2,31,000	2,41,000	2,30,000
Tlc (/cumm)	16,000	16,300	14,500	13,000
Neutrophil (%)	90	89	80	75
Lymphocyte (%)	7	5	9	6
Rbs (md/dl)	140	135	133	128
B. Urea (md/dl)	40	50	34	42
S. Creatinine (md/dl)	1	1.3	1.3	0.8
Sodium (mmol/l)	133	136	134	138
Potassium (md/dl)	3.8	4	4.5	3.9
Atrial Blood Gas				
pH	7.30	7.32	7.38	7.39
PO2	50	90	128	129
PCO2	28	32	36	32
HCO3	18	20	22	20
Lactate	5.7	2.8	1.3	1

DOA= day of admission

Following 48 hours of management, the patient's signs and symptoms gradually improved. The oxygen supplement was tapered from a face mask to a nasal cannula. The patient's fluid balance was normalized. Regular medication for Hypertension and DM was continued. The patient was initiated on chest physiotherapy and spirometry. Repeat chest X-ray was found to be normal. The patient was discharged from the ICU on the second day of ICU admission with stable vital signs and improved respiratory status. A patient with a known allergy to ceftriaxone was given a card indicating this allergy. She was counselled regarding the importance of follow-up visits and advised on measures to prevent recurrence. On further follow-up, her general examination, systemic examination, and investigations were within normal range.

DISCUSSION

Anaphylaxis is an immediate, potentially fatal reaction that is typically, but not always, caused by immunologic mechanisms [6]. Antimicrobials, NSAIDs, anesthetics, radio-contrast dyes, nutrition, and latex are among the common culprits [7]. Anaphylaxis to ceftriaxone is quite rare. Lin et al. reported 17 cases of ceftriaxone-related anaphylaxis [8]. Although anaphylaxis can manifest with a variety of clinical presentations, the most common causes of death are cardiovascular and pulmonary failure. The antibiotic screening test with intradermal skin injection is rapid, inexpensive, and sensitive; however, it can be associated with higher rates of false-positive and false-negative results.

In the present case, the patient was non-reactive for the intradermal skin sensitivity test for the Ceftriaxone antibiotic. After Ceftriaxone administration, the patient developed clinical features suggestive of anaphylaxis. A negative skin test result does not rule out the possibility of an immediate-type allergy reaction. The mainstay of treatment for anaphylaxis is Adrenaline. Our finding is supported by published case reports of ceftriaxone-induced adverse drug reactions by Hirachan et al and Kumari et al [9,10].

Some recent cases of similar reactions following ceftriaxone administration are described in Table 2.

Table 2: Recent cases of reactions after injection ceftriaxone.

S.N	Patient demographics	Year	Author
1	75 year old female	2024	Schattner et al [11]
2	66 year old female	2022	Abodunrin et al [2]
3	68 year old male	2021	Ameya Puranik [12]
4	31 year old female	2017	Imam et al [13]
5	36 year old male	2016	Badar et al [1]
6	22 year old male	2015	Kumari et al [10]

CONCLUSION

Diagnosis of anaphylaxis is based on clinical history and skin testing, which can also be misleading. In the present case, the patient showed an anaphylactic reaction to ceftriaxone administration even after showing negative intradermal skin testing, but was managed successfully without any residual compromise. This case highlights the importance of early diagnosis, prompt intervention, close supervision, and collaboration in achieving better outcomes for patients with anaphylactic shock.

Ceftriaxone-induced anaphylaxis, though rare, can present with life-threatening and rapidly progressing symptoms that require immediate recognition and intervention. Clinicians should remain vigilant for anaphylactic reactions following ceftriaxone administration, emphasizing the importance of close monitoring and prompt management to improve patient outcomes.

DECLARATION

Author contribution

The author contributions to this research are as follows: SB was primarily responsible for the concept. PB made significant contributions by designing the study, interpreting the data, drafting the manuscript, reviewing it for important intellectual content, providing final approval of the version ready for submission, agreeing to be accountable for all aspects of the work, and handling all correspondence with the journal. AS performed the literature search and also contributed to conceptualizing the research. SA was involved in data collection and assisted in conceptualizing the research.

Conflict of interest

All authors declare that they have no potential conflicts of interest.

Consent of the study

The patient involved in this study provided consent to publish this case report and provided written permission.

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REFERENCES

1. Badar VA, Deshmukh S, Garate P, et al. Ceftriaxone induced anaphylaxis in a tertiary care hospital in central India. 2016;6.
2. Abodunrin F, Ismayl M, Aboeata A, et al. A case report of ceftriaxone-induced cardiopulmonary arrest. Ann Med Surg. 2022;84. doi: 10.1016/j.amsu.2022.104813
3. Johansson SGO, Bieber T, Dahl R, et al. Revised nomenclature for allergy for global use: Report of the Nomenclature Review Committee of the World Allergy Organization, October 2003. J Allergy Clin Immunol. 2004;113:832–6. doi: 10.1016/j.jaci.2003.12.591
4. Saritas A, Erbas M, Gonen I, et al. Asystole after the first dose of ceftriaxone. Am J Emerg Med. 2012;30:1321.e3-1321.e4. doi: 10.1016/j.ajem.2011.05.032
5. Devada S, Bhawna S, Sandeep S, et al. Ceftriaxone Induced Anaphylaxis Reaction Following Negative Intradermal Skin Tested Patient: A Rare Case Report. Int J Pharm Sci Rev Res. 2022;66–9. doi: 10.47583/ijpsrr.2022.v75i01.011
6. Ryder S-A, Waldmann C. Anaphylaxis. Contin Educ Anaesth Crit Care Pain. 2004;4:111–3. doi: 10.1093/bjaceaccp/mkh035
7. Kemp SF, Lockey RF. Anaphylaxis: A review of causes and mechanisms. J Allergy Clin Immunol. 2002;110:341–8. doi: 10.1067/mai.2002.126811
8. Lin RY. A Perspective on Penicillin Allergy. Arch Intern Med. 1992;152:930. doi: 10.1001/archinte.1992.00400170020005
9. Hirachan R, Gopi P, Bibek R, et al. Anaphylaxis to Ceftriaxone – Evaluation of Two Cases. J Gandaki Med Coll-Nepal. 2018;11:82–4. doi: 10.3126/jgmcn.v11i02.22990
10. Kumari A, Gupta R, Bajwa SJ, et al. A rare case of ceftriaxone induced anaphylaxis in anaethesia practice. Arch Med Health Sci. 2015;3:106. doi: 10.4103/2321-4848.154958
11. Schattner A, Dubin I. Ceftriaxone near-fatal anaphylaxis. Postgrad Med J. 2024;qgae066. doi: 10.1093/postmj/qgae066
12. Puranik A. Ceftraixone induced anaphylaxis and death: a case report. Int J Basic Clin Pharmacol. 2021;10:442. doi: 10.18203/2319-2003.ijbcp20211030
13. Imam EA, Ibrahim MIM. Ceftriaxone-Induced Fatal Anaphylaxis Shock at an Emergency Department: A Case Report. J Pharm Pract Community Med. 2017;3:299–301. doi: 10.5530/jppcm.2017.4.75