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Original Article

A case report on antibiotic-induced skin rashes in a tertiary care hospital in Southern Odisha.

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Abstract

Background
Antibiotics, while essential in treating infections, are also among the most common causes of cutaneous adverse drug reactions (ADRs), especially in pediatric populations. This report presents two pediatric cases of antibiotic-induced skin rashes following administration of ceftriaxone and vancomycin.
Objective: To report and analyze two pediatric cases of antibiotic-induced cutaneous adverse drug reactions (ADRs), one due to ceftriaxone and the other to vancomycin, highlighting their clinical presentation, management, and implications for pharmacovigilance in a tertiary care setting.

Case Presentation
Case 1 involves a 9-month-old male with left-sided empyema who developed erythematous rashes within one hour of receiving intravenous ceftriaxone. The reaction was managed with intramuscular antihistamine (Pheniramine), and ceftriaxone was discontinued.
Case 2 reports a 9-year-old male with pyrexia of unknown origin, who developed widespread rashes after 13 days of vancomycin therapy. The reaction was suspected to be a delayed-type hypersensitivity. Vancomycin was discontinued, and intravenous methylprednisolone was initiated.
Causality assessment: Both reactions were assessed as "probable" according to the WHO-UMC Causality Assessment Scale.

Discussion
These cases highlight the potential of beta-lactam (ceftriaxone) and glycopeptide (vancomycin) antibiotics to induce immediate and delayed cutaneous hypersensitivity reactions. While often underreported, these reactions can be managed effectively with prompt drug withdrawal and appropriate treatment. The importance of vigilant pharmacovigilance, especially in pediatric settings, is emphasized.

Conclusion
Antibiotic-induced skin reactions in children warrant early identification, rational drug use, and avoidance of re-exposure. Strengthening pharmacovigilance practices and conducting larger studies can aid in better understanding and prevention.

Recommendations
Routine monitoring of pediatric patients on antibiotics for hypersensitivity symptoms, detailed allergy history-taking, timely reporting to pharmacovigilance programs, and patient/caregiver education are essential. Rechallenge with the suspected drug should be avoided.

Keywords: *Antibiotic-induced skin rash, Ceftriaxone, Vancomycin, Adverse Drug Reaction, Pediatric hypersensitivity, Pharmacovigilance*
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Introduction

Antibiotics are drugs used in the treatment of bacterial infections, derived mainly from soil bacteria, as well as semi-synthetic and synthetic varieties, causing cutaneous skin eruptions.

Beta-lactams can also cause skin eruptions, which are allergic reactions to beta-lactams. Cutaneous ADRs account for 10-30% and are most commonly due to antibiotics. Some of the Cutaneous ADRs caused by beta-lactams are skin rashes, urticaria, itching, fixed drug eruption, etc. Ceftriaxone, a cephalosporin, used for a variety of bacterial infections, is known to be associated with side effects such as urticaria, skin rash, etc. The incidence of Ceftriaxone-related hypersensitivity reactions is between 1-3% [1].

Vancomycin, a multifaceted tricyclic glycopeptide antibiotic, has robust bacterial activity in contradiction to an extensive range of Gram-positive bacteria, and is a drug of choice for the treatment of infections due to methicillin-resistant Staphylococcus aureus (MRSA), Corynebacterium jeikeium, resistant strains of Streptococcus pneumoniae, plus pseudomembranous colitis. It is also an alternative drug for people with allergies to penicillins and/or cephalosporins. It causes an erythematous rash involving the face, neck, and upper torso is a typical ADR.

Adverse drug reactions were seen among paediatric patients, of which different types of hypersensitivity reactions are skin rashes, urticaria, itching, etc. Skin rashes were seen mostly in the trunk area and extremities. The World Allergy organization recommends categorizing hypersensitivity reactions based on timing of the appearance of symptoms as immediate (i.e., develops within 1 hour of drug exposure) or delayed – type (i.e., onset after 1 hour of drug exposure) reactions (immunoglobulin E {IgE}- mediated) hypersensitivity reactions pose the greatest clinical concern because of the risk of life-threatening anaphylaxis; delayed-type reactions mostly commonly present as rashes or skin lesions [2].

Causal association between the drug and the reaction is considered depending on the lag period between the start of the drug and the appearance of the reaction, responses to de-challenge and re-challenge tests, and the data available regarding the drug.

Drug rashes are mostly caused by an allergic reaction to a drug. Classic symptoms comprise redness, bumps, blisters, hives, itching, and sometimes peeling or pain. Every drug a person takes may have to be stopped to figure out which one is causing the rash. Most drug rashes resolve once the drug is stopped, but mild reactions may be treated with ointments to decrease symptoms, and serious reactions may require treatment with drugs such as epinephrine, diphenhydramine, and a corticosteroid to avert complications. The word "rash" refers to changes in skin color (such as redness) and/or texture (such as bumps or swelling). Many rashes itch, such as those that often develop after allergic reactions, but some rashes are painful or cause no symptoms. Drugs can cause rashes in several ways [3].

Objective

To report and analyze two pediatric cases of antibiotic-induced cutaneous adverse drug reactions (ADRs), one due to ceftriaxone and the other to vancomycin, highlighting their clinical presentation, management, and implications for pharmacovigilance in a tertiary care setting.

Case Report 1

A male patient aged 9 months, weighing 9 kgs, presented to the Casualty OPD on 10.03.2025, with complaints of fever, associated with cough, since 15 days. He was admitted to the Emergency Room on the same day. He was found to have fluid accumulation in the left lung, as seen on X-ray. Also, his laboratory reports suggested increased WBC count [20,000 cells/µL (Normal Range – 6,000 to 17,500 cells/µL)]. Past medical and family history revealed no known allergies or chronic illnesses. No significant social or genetic predisposition was identified.

He was diagnosed with left-sided Empyema, for which he was administered Injection Ceftriaxone through the Intravenous route in a dose of 500mg two times a day. But on administration of 1st dose of Injection Ceftriaxone, he first developed redness around the umbilicus, and then he developed redness in both upper & lower extremities, 1 hour after the injection was administered. Injection Avil (Pheniramine maleate), an antihistamine, through the I.M. route was given to the patient, and the reaction (i.e., redness) subsided. Ceftriaxone was not given further.

Case Report 2

A male patient aged 9 years, weighing 17.5kgs, was admitted to the paediatrics ward on 26/02/2025 with complains of fever. His lab reports showed increased WBC count [17,000 cells/µL (Normal Range – 4,800 to 10,800 cells/µL)]. He also has increased CRP, and his anti-nuclear antibody was negative. His bone marrow biopsy report showed accelerated myelopoiesis, normal maturation, and the presence of toxic granules suggestive of acute infection. He was diagnosed with Pyrexia of Unknown Origin. He was administered Injection Ceftriaxone 900 mg I.V. twice daily starting from 27/02/2025 till 01/03/2025. Past medical and family

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history revealed no known allergies or chronic illnesses. No significant social or genetic predisposition was identified.

He was then administered Injection Piperacillin + Tazobactum 17cc I.V. three times a day starting from 02/03/2025 till 06/03/2025, also Injection Vancomycin 2.6cc + 50cc Normal saline slow I.V. four times a day starting from 02/03/2025 till 15/03/2025. He was then started on Injection Meropenem 1g + 10cc distilled water slow I.V. three times a day, 06/03/2025 till 19/03/2025. He developed rashes starting from the trunk, then developed in the upper and lower extremities after 13 days of drug administration of Vancomycin, on 15/03/2025, after 1 hour of administration. Vancomycin was stopped, and Injection Methyl Prednisolone 1g + 10cc distilled water I.V. was given start dose on 15/03/2025 and given once daily till 19/03/2025.

Table 1: Case summary table

Sl no.	Age & Gender	Diagnosis	Treatment given	The drug responsible for ADR	Description of ADR	Management of ADR
1.	9 months, Male	Left side Empyema	1. Injection Ceftriaxone 500mg I.V. twice daily.	1. Ceftriaxone	1. There was redness around the umbilicus 2. There was redness in both upper and lower extremities, developed 1 hour after administration of the injection	Injection AVIL (Pheniramine Maleate) 1mL I.M. was given. The reaction due to the suspected drug was stopped.
2.	9 years, Male	Pyrexia of Unknown Origin	1. Injection Ceftriaxone 900 mg I.V. twice a day – 27/3/2025 to 01/03/2025 2. Injection Piptaz 17cc I.V. three times a day – 02/03/2025 to 06/03/2025 3. Injection Vancomycin 2.6 cc + 50 cc NS slow I.V. four times a day – 02/03/25 to 15/03/25 4. Injection Meropenem 1g+10cc distilled water (or 7 cc + 20 mL distilled water) I.V. three times a day – 06/03/2025 to 19/03/2025 5. Injection Doxycycline 100mg + 10 cc distilled water twice a day – 11/03/2025 to 15/03/2025.	1. Ceftriaxone 2. Vancomycin	1. The patient developed rashes in the trunk region. 2. The patient then developed in the upper and lower extremities, after 13 days of drug administration.	Injection Methyl Prednisolone 1g + 10 cc distilled water – 11/03/2025 to 19/03/2025 The patient did not recover completely. But the reaction due to the suspected drug did not aggravate further.

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Suspected Drugs and Reactions	WHO – causality assessment scale*
CASE 1: Ceftriaxone-induced Rash	Probable
CASE 2: Vancomycin-induced Rash	Probable

Table 2: ADR analysis
*According to the WHO-UMC Causality Assessment Scale

Discussion

Adverse drug reactions are a leading threat to modern medicine. Cutaneous ADRs are significant clinical articles that can jeopardize the life of the patient. Drug rash with eosinophilia and systemic symptoms syndrome is a life-threatening adverse reaction to a drug with an associated mortality rate of about 10%.
Ceftriaxone, a third-generation cephalosporin, was frequently prescribed after 1984. It is being applied across almost all specialties for various conditions. Ceftriaxone – provoked urticaria, rash, exanthema, and pruritus are the common adverse effects [4]. A research study shows those paediatric patients suspected of infections on an outpatient basis were prescribed antibiotics. Patients prescribed an antibiotic had more suspicion of adverse drug reaction, and frequently, it was observed with dermatological manifestations among patients who had received the antibiotic. Among the received antibiotics for enrolled patients, cefaclor has more reports of causing rash than other antibiotics. Rashes documented for cefaclor, penicillins, sulfonamides, and other cephalosporins were 12.3%, 7.4%, 8.5% and 2.6% respectively, for children. As per the findings of this research study, paediatric patients who had experienced rashes and received antibiotics had minor and not severe or life-threatening reactions [5]
Vancomycin is indicated for potentially life-threatening infections caused by susceptible organisms that cannot be treated with another effective, less toxic antimicrobial drug. The use of Vancomycin is limited by its poor oral absorption and potential for nephro- and ototoxicity [6, 7]. A study showed that in their prospective trial, treatment–related adverse reactions were observed in 22-43% of patients treated with Vancomycin. The clinical manifestations of an antibiotic allergy may be cutaneous, organ–specific (e.g., haematologic abnormalities, hepatitis, and nephritis), or systemic (e.g., anaphylaxis, fever, or a combination). Among them, skin rashes comprised about 5% of the ADRs. This study focused on cutaneous ADRs induced by Vancomycin among spontaneously reported ADRs at a university hospital.

Generalizability

Due to the small sample size and the setting in a single tertiary care hospital, the findings of this report cannot be generalized to the wider pediatric population. However, it emphasizes the importance of Pharmacovigilance and early recognition of cutaneous adverse drug reactions in pediatric patients receiving antibiotics. Larger observational studies or Pharmacovigilance data analyses are needed to validate these observations and improve general applicability.

Conclusion

Patients who have received or are receiving antibiotics irrespective of any medical conditions need to be monitored for any allergic reactions, which may be predictable under certain clinical circumstances, depending upon how the case history was obtained from the respective patient by the concerned health care professional. The dermatological reactions caused by irrespective of any antibiotic will always vary from one to another, which needs to be assessed according to drug characteristics. It is important to assess allergic reaction to antibiotics by considering the following aspects, such as the purpose of the prescribed antibiotic, the dosage regimen according to the severity of infection, duration of antibiotic, allergic history of the patient, concomitant medications prescribed with the antibiotic, and over-the-counter medication history. The older research studies had reflected that antibiotics causing dermatological reactions can vary from one to another. Time temporal relationship will vary from one antibiotic to another with respect to any dermatological reaction induced, as per older research studies. The predictability of hypersensitivity reactions to any antibiotics cannot be assured at any point in time, as per older research studies. Any patient experiencing any type of dermatological reaction to antibiotics should be treated initially with antihistamines. If itching and irritation caused by antibiotics do not subside with antihistamines, the patient should be treated with corticosteroids as per evidence-based information. Any patient with a history of allergic

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reaction to an antibiotic should always be given a red alert, and the patient should be counseled in such a way that they should carry this red alert with them whenever the patient undergoes clinical examination. Any doctor reviewing a patient with an allergic history of an antibiotic should not prescribe any medicinal product that contains the offending agent in the future. Irrational use of antibiotics could also be one of the predisposing factors for causing dermatological allergic reactions in according to older research studies. Therefore, the patient has to be properly assessed according to case history, and the right antibiotic should be chosen until and unless there is a need in that particular patient.

Limitations

This study is limited by its design as a case report involving only two pediatric patients. The absence of confirmatory diagnostic tools such as skin biopsy, serum IgE levels, and drug rechallenge tests limits the strength of causal inference. Additionally, genetic predisposition and other potential contributing factors (e.g., concurrent medications, environmental exposures) were not assessed. The findings rely on clinical observation and temporal association, which may be influenced by reporting bias and lack of long-term follow-up.

Recommendations

Routine Monitoring: Pediatric patients prescribed antibiotics, especially beta-lactams and glycopeptides like ceftriaxone and vancomycin, should be closely monitored for early signs of hypersensitivity reactions.
Detailed Drug History: A thorough allergy and medication history should be documented before initiating antibiotic therapy to identify potential risk factors.
Pharmacovigilance Reporting: All suspected adverse drug reactions (ADRs), including non-severe skin rashes, should be promptly reported to national pharmacovigilance systems to strengthen post-marketing surveillance data.
Patient and Caregiver Education: Caregivers should be educated to recognize early symptoms of allergic drug reactions and to seek timely medical attention.
Avoid Rechallenge: In cases of suspected antibiotic-induced hypersensitivity, re-exposure to the suspected drug should be avoided, and alternative agents should be chosen carefully, considering potential cross-reactivity.
Further Research: Larger, multicentric observational studies are needed to identify risk factors, incidence patterns, and outcomes associated with antibiotic-induced skin reactions in the pediatric population.

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Availability of data and materials

All clinical data and treatment details used in this case report were extracted from hospital medical records, with patient consent.

Conflict of interest

The authors declare no conflict of interest in the publication of this case report.

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Author's contribution

Dr. Suvendu Kumar Panda (First and Corresponding Author): Conceptualized the study, supervised case documentation, performed causality assessment, and prepared the initial draft of the manuscript.

Dr. Mousumi Pradhan (Second Author): Collected clinical data, participated in patient evaluation and management, contributed to literature review, and assisted in manuscript writing.

Dr. Snehasini Dash (Third Author): Assisted in data analysis and interpretation, critically reviewed the manuscript for intellectual content, and helped finalize the discussion section.

Dr. Jasmine Mahanta (Fourth Author): Contributed to patient follow-up, data compilation, editing of the manuscript, and ensuring adherence to case report guidelines.

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List of abbreviations

Abbreviation	Full Form
ADR	Adverse Drug Reaction
CBC	Complete Blood Count
I.V.	Intravenous
I.M.	Intramuscular
WBC	White Blood Cell
CRP	C-Reactive Protein
NS	Normal Saline
OPD	Outpatient Department
PvPI	Pharmacovigilance Programme of India
WHO	World Health Organization
IgE	Immunoglobulin E
MRSA	Methicillin-Resistant Staphylococcus aureus
DRESS	Drug Reaction with Eosinophilia and Systemic Symptoms
UMC	Uppsala Monitoring Centre

Author biography

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References

1. A rare case of Ceftriaxone-induced anaphylaxis in anesthesia practice. Anita Kumari1, Ruchi Gupta2, Sukhminder Jit Singh Bajwa2, Jagdeep11 Department of Anesthesiology and Intensive Care, Sri Guru Ramdas Medical College and Hospital, Amritsar, Punjab, India2Department of Anesthesiology and Intensive Care, Gian Sagar Medical College and Hospital, Banur, Punjab, India Year: 2015, Volume : 3, Issue: 1, Page: 106-109
2. Davey P. Legendre Christina A. Muzny Galien D, et al. Antibiotic Hypersensitivity Reactions and Approaches to Desensitization. Clinical Infectious Diseases, volume 58, Issue 8, 15 April 2014, Pages 1140-1148. https://doi.org/10.1093/cid/cit949
PMid:24368623
3. Drug Rashes by Mercedes E. Gonzalez, MD, University of Miami Miller School of Medicine. Last full review/revision Mar 2018. Content last modified May 2025.
4. International Journal of Science and Healthcare Research Vol 4; Issue 2; April-June 2019 Website: www.ijshr.com Case Report ISSN: 2455-7587 Ceftriaxone Induced Rash Dermatitis: A Case Report Vageeshwari Devuni CMR College of Pharmacy, Kandlakoya, Medchal road, Hyderabad.
5. Sharma VK, Sethuraman G. Adverse cutaneous reactions to drugs: An overview. J Postgrad Med. 1996;42:15-22.

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Original Article

6. Mylan New Zealand Ltd.2011. Vancomycin Data Sheet. 25 May 2011. URL: www.medsafe.govt.nz/profs/datasheet/v/VancomycinMylaninf.pdf (accessed 31 March 2025).

7. Hospira NZ Limited. 2011 DBL. Vancomycin Hydrochloride Data Sheet. 15 December 2011. URL: www.medsafe.govt.nz/profs/datasheet/v/Vancomycin.pdf (accessed 31 March 2025).

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