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A case report on life threatening hypotensive anaphylactic shock induced by ceftriaxone with clinidipine [drug-drug interaction]

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Abstract

Introduction: Drug-Drug interactions are more common and can occur between the two drugs that are synergistic or antagonistic in nature and thus leads to either increased or decreased drug effect. Ceftriaxone is a third generation beta lactam antibiotic used for the treatment of various bacterial infections. Anaphylactic reactions by ceftriaxone are rare and sometimes these reactions are often considered to be life threatening if they developed such as skin reactions, hypotension and angioedema etc. Whereas Clinidipine is a calcium channel blocker used in treatment of Hypertension. The most serious adverse effects associated with Clinidipine are fast heartbeat, angioedema and hypotension etc.

Case Presentation: we report a case of a 60 years old male patient admitted in Government General Hospital with a generalised weakness, shortness of breath after the administration of IV Ceftriaxone injection from outside hospital and was on antihypertensive medication Clinidipine of dose 5 mg.

Discussion: The condition was diagnosed as Drug induced hypotensive anaphylactic shock. Immediately all the antihypertensive drugs were stopped and other drugs were provided for symptomatic recovery. The patient was recovered from his condition and antihypertensive drug clinidipine was continued.

Conclusion: This work Provides newer evidence of fatal drug combination between ceftriaxone and clinidipine to Health Care Professionals and also emphasises the need for management of such anaphylactic conditions by the withdrawal of causative agent to prevent the progression of reaction.

Keywords

ceftriaxone; clinidipine; hypotension; anaphylaxis; life threatening

Abbreviations

HB: Haemoglobin; WBC: White blood cells; RBC: Red blood cells

Introduction

Drug -drug interactions were a type of treatment related problems which modifies the drug effects and interferes in achieving the positive therapeutic responses in the clinical settings as a result which leads to decreased quality of life and increased hospital expenses [1]. Interactions between any two drugs were the second most Adverse drug events in the hospital settings next to adverse events caused by drugs alone [2]. Ceftriaxone is a third generation beta lactam antibiotic that is used in treatment of variety of gram positive and gram negative bacterial infections. Adverse drug reactions associated with ceftriaxone can occur in 10% of patients who were administered with this medication which are mostly anaphylactic reactions that are mediated by Ig E antibodies which in turn stimulates the release of chemical mediators like Histamines and prostaglandins [3]. Clinidipine is a calcium channel antagonist that belongs to class of drugs Dihydropyridines which is used in the treatment of hypertension. Its antihypertensive effects are mediated by blockade of both N-type and L-type calcium channels [4]. Among the both drugs ceftriaxone causes anaphylactic reactions like hypotension [5] which can be aggravated in the presence of other drugs like Clinidipine and become as most serious life threatening condition. There were various literature evidences suggesting the adverse effects of these two drugs alone but none of the studies reported this fatal drug combination of ceftriaxone with clinidipine within clinical settings that leads to a life threatening hypotensive anaphylactic shock. Hence this presentation signifies the importance of a newer fatal drug- drug interaction to a health care professionals and also there was a great need of management of such anaphylactic conditions by the withdrawal of causative agent because most of these reactions are predictable and were dose dependent.

Case Presentation

A 60 years old male was admitted in the Government General Hospital, Kadapa with the complaints of generalised body weakness, lethargy, shortness of breath, loss of consciousness and burning sensation after immediate administration of inj. Ceftriaxone IV 1gm from outside hospital. His past medication history reveal was a hypertensive with type 2 diabetic and using an antihypertensive medication Clinidipine 5 mg one tablet per day since 3 years and oral hypoglycaemic drug Glimepiride 1mg half tablet since 2 years. The condition was diagnosed as drug induced anaphylactic shock(hypotension) which is precipitated severely by administration of ceftriaxone in presence of Clinidipine. His laboratory investigations were as follows: Hb- 11.9gm/dl, WBC- 7800 cells/cu mm, eosinophils- 03%, Basophils- 01%, Lymphocytes- 24%, platelets- 2 lakh cells, RBC- 4.2 millions/ cu mm, Sr. Creatinine- 0.9 mg/dl, total bilirubin- 0.8 mg/dl, Sr. Urea- 20 mg/dl.

Results & Discussion

After suspecting the condition, the patient was advised to stop all antihypertensive medications as his blood pressure was not recordable and given treatment with medications like Inj. Noradrenaline 2 ampules in 46ml of 5% dextrose @ 4 ml/hr, Inj. Pantoprazole 40 mg IV TID, Inj. Hydrocortisone 100 mg IV TID, Oxygen inhalation, T. Metformin 500mg OD. Later he gained consciousness and his Blood pressure values were recorded as 110/80 mm of Hg, 130/90 mm Hg, 130/80 mm of Hg upon random measure and the patient got the symptomatic relief.

In our case report the adverse drug reaction reaction occurred after the administration of inj. Ceftriaxone. To evaluate the relationship between the drug and adverse drug reaction we performed causality assessment by using the Naranjo scale.

Table 1: Causality assessment of suspected ADR

ADR SCALE	ASSESSMENT
NARANJOS	Probable

Table 2: Analysis of observed ADR

SEVERITY ASSESSMENT	Moderate level- 4 (b)
PREVENTABILITY	Probably preventable
PREDICTABILITY	Type -A

The side effects of drug presented as adverse drug reactions involves one organ or multiple organs. In general, adverse drug effects associated with beta lactam antibiotics are least severe but they can be life threatening [6] in presence of other drugs or by drug- drug interactions as presented in our case report.

Anaphylaxis reactions to drugs were mediated by mast cells induced or Ig E antibodies production. In particular, with cephalosporin, there were previous literatures which reported the deaths due to the Anaphylactic reactions [7]. The main cause for the occurrence of anaphylactic reactions are mostly the Drug- Drug interactions between the foods or the other drugs [8] which can precipitate the toxicity as seen in our case. In general, exact haptenic determinants of cephalosporin antibiotics are unknown it is best to employ skin test reagents to detect the presence of Ig E antibodies [9]. Among the cephalosporin antibiotics ceftriaxone is mostly reported with serious adverse events as compared with other class of drugs like penicillin's, Macrolides and quinolones [10]. In other hand Clinidipine an antihypertensive drug by its unique action on sympathetic N^- type Ca^{2+} channels attenuate norepinephrine release and leads to vasodilation and causes hypotension. Thus, Clinidipine vasodilation effect is due to reduction in hypotensive – induced baroreflex sympathetic stimulation [11]. In this present report patient did not experience such an hypotensive shock with Clinidipine alone as he was using the drug since 3 years but when patient administered IV Ceftriaxone 1gm with antihypertensive drug he suddenly developed this adverse event as both the drugs as property of causing hypotension (serious drug-drug interaction) and became a life threatening condition with his blood pressure not recordable and this was supported by the previous literature evidences suggesting that numerous potential drug interactions in hypertensive patients were reported with many drug combinations that were severe in nature [12]. Another study reported that only due to errors in therapy there were nearly 7000 deaths occurred annually hence a stringent care must be taken [13]. Existing evidences suggested that normally clinidipine was preferred in the patients with end organ failures like diabetic and kidney failure but however it was contraindicated in the conditions like hypotension [14] which the patient developed in our case presentation. We cannot consider the other extrinsic factors like foods that resulted in anaphylaxis because there were studies reported that bioavailability of clinidipine doesn't change with food [15]. Later, immediate dechallenge of all antihypertensive medications by physician and with symptomatic treatment made the condition of patient better regained his consciousness and blood pressure was recordable then again he was re-challenged with same antihypertensive medication. As this type of drug events were predictable hence they must be identified early by the health professionals by us-

ing of Risk rating systems as one of the options for better therapeutic outcomes.

Conclusion

This work was the first of its kind to generate an evidence of new fatal drug combination in clinical settings that leads to severe condition of anaphylaxis. This also drawn enough data for the healthcare professionals to avoid such combinations of drug and also there was a more responsibility on health care team like physicians and other staff for management of such anaphylactic conditions by the withdrawal of causative agent to prevent the progression of reaction.

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References

1. Rand Nidal Hussein, Osama Mohamed Ibrahim. Assessment of treatment-related problems and associated factors among hospitalized patients in the United Arab Emirates: A retrospective study. JPHSR. 2018; 1-6.

2. Iram Kahkashan, Shabnam Chowdhary, Vishal R Tandon, Sharminder Kaur, Vijay Khajuria Z, Gillani. Critical Analysis of Quality Adverse Drug Reaction Related Published Reports in Indian Biomedical Journal. JK SCIENCE. 2017; 19: 59-63.

3. Shalviri G, Yousefian S, Gholami K. Adverse events induced by ceftriaxone: a 10-year review of reported cases to Iranian Pharmacovigilance Centre. Journal of Clinical Pharmacy and Therapeutics. 2011; 1-4.

4. Mukesh Madhukar Shete. Cilnidipine: Next Generation Calcium Channel Blocker. Journal of the Association of Physician of India. 2016; 64: 95-99.

5. Qing-Ping Shi, Xiao- Dong Jiang, Feng Deng, Mei-Ling Yu, Shu- Qiang Zhang. Adverse Drug Reactions and Pattern Use of Cephalosporins: A Retrospective review of Hospitalised patients during 5 years. International Journal of Pharmacology. 2013; 9: 66-73.

6. Burke A Cunha. Antibiotics side effects. Medical clinics of North America. 2001; 85: 149-185.

7. MR Ernst, PJ van Dijken, PJ Kabel, JMTh Draaisma. Anaphylaxis after first exposure to ceftriaxone. 2002; 91: 355-359.

8. Yiwen Shen, Ling Li, Jami Grant, Ana Rubio, Ziqin Zhao, Xiang Zhang, et al. Anaphylactic deaths in Maryland (United States) and Shanghai (China): A review of forensic autopsy cases from 2004 to 2006. Forensic Science International. 2009; 186: 1-5.

9. A. Romanao, C. Mondino, M. Viola, P. Montuschi. Immediate Allergic Reactions to beta Lactams: Diagnosis and Therapy. International Journal of Immunopathology and Pharmacology. 2003; 16: 19-23.

10. Giovanni Polimeni, Francesco Salvo, Paola Cutroneo, Ilaria Morreale, Achille Patrizio Caputi. Adverse Reactions Induced by NSAID and Antibacterials. Drug Safety 2006; 29: 449-459.

11. Hisayuki Uneyama, Hirohisa Uchida, Tomoyuki Konda, Rayota Yoshimoto. Clinidipine: Preclinical Profile and Clinical Evaluation. Cardiovascular Drug Reviews. 1999; 17: 341-357.

12. Erna Yanti, Erna Kristin, Alfi Yasmina. Potential Drug Interactions in Hypertensive Patients in Liwa District Hospital, Lampung Barat, Indonesia. International Journal of Pharmacy and Pharmaceutical Sciences. 2017; 9: 134-138.

13. Vincent WL. Tsui, Dixon Thomas, Shuhui Tian, Allen J. Vaida. Adverse Drug Events, Medication Errors and Drug Interactions. In: An Update. Pharmacoepidemiology and Pharmacovigilance. 2019; 227-245.

14. MMR Siddiqui, SS Binte Mosharraf, RS Giasuddin, N Islam, S Mirza. What is New in New Generation Calcium Channel Blocker. AKMMC J. 2019; 10: 77-83.

15. www.Shodhganga.inflibnet.ac.in › jspui › bitstream.

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