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Case report ***Health research***

A case report on Ceftriaxone induced Hypersensitivity Reactions (Urticaria)

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ABSTRACT

Ceftriaxone is a third generation cephalosporin group of broad spectrum anti-biotic. It active against the gram positive and gram negative organisms. Which is commonly used antibiotic in patients with various infections like respiratory tract infection, urinary tract infection, enteric fever and meningitis. Hypersensitive reactions subsequent ceftriaxone therapy is unusual but is potentially life-threatening. It is rapidly occurring reactions, hence called immediate hypersensitivity reactions. Whenever the patient exposure to certain drugs (penicillin, cephalosporin's and aspirin) production of IgE antibodies – fix to mast cells then again re-exposure to the same drug antigen-antibody reaction occurs on the mast cell surface then release of inflammatory mediators like histamine, 5-HT, PGs, LTs, PAF these mediators cause the hypotension, bronchospasm, angioedema, urticarial, rhinitis and anaphylactic shock. The management of hypersensitivity reactions which include inj.Adrenalin 0.3 to 0.5ml, intramuscularly, inj.Hydrocortisone 100 to200 mg, intravenously, inj. Pheniramine 45 mg intravenously. Here we report a 28 years female who presented with the hypersensitivity reactions with ceftriaxone therapy.

Keywords: Ceftrioxone, third generation cephalosporin, hypersensitivity reactions,

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INTRODUCTION

Ceftriaxone is a long acting, third generation, broad-spectrum cephalosporin group of beta lactom antibiotic. Ceftrioxone bactericidal action is through the inhibition of cell wall synthesis and it exerts in-vitro activity against a wide range of gram-positive and gram-negative microorganisms. Intravenous administration of ceftriaxone is generally well tolerated and used for the treatment of serious bactericidal infections. Ceftrioxone is having the few adverse effects, among that hypersensitivity reactions are the most common one.[1] The incidence of ceftrioxone induced severe allergic reactions are 1-3%, and the incidence of anaphylaxis reactions are still lesser rat 0.1-0.0001%.[2] In the same way, there are inadequate reports regarding life threatening anaphylaxis even after negative skin test given through surgical prophylaxis[3,4]. The mechanism of hypersensitivity reactions in our patient may be IgE-dependent conversely it is difficult to explain since there was no history of previous exposure to cephalosporin group of antibiotics or penicillin, though the history was not dependable. Unlike for penicillin's, skin testing for cephalosporin's is not heterogeneous[5]. And there is no skin test that can constantly expect whether a patient will noticeable an allergic reaction to ceftriaxone.[6] The patients who are an allergic reaction to a exact cephalosporin almost certainly should not receive that cephalosporin group again. Cross reaction between cephalosporin's perform but at a lower rate[7.] Detailed history of the patient regarding prior antibiotic allergy should take in full account of the symptoms such as urticaria, respiratory difficulties, angioedema, purities, or severity of reaction as well as the timing of reaction after prescription treatment. The positive and negative prognostic values of skin testing results for cephalosporin group of antibiotics are not well established[8]. Drug allergies can be categorized into IgE-mediated (type I immediate-type) and non-IgE mediated hypersensitivity reactions. IgE-mediated reactions include angioedema, anaphylaxis, urticaria and broncho spasm occurs within 72 hours after taking the cephalosporin anti-biotic. Non-IgE mediated hypersensitivity reactions Include interstitial nephritis, haemolytic, anemia, thrombocytopenia, Stevens-Johnson syndrome, serum sickness, drug fever, morbilliform eruptions, erythematic, multiform, and toxic epidermal necrolysis occur most commonly after 72 hours of drug administration[9]. Drug-induced Hypersensitivity reaction is a life-threatening systemic reaction categorized by cutaneous rash, internal organ involvement, lymphadenopathy, fever, eosinophilia and leukocytosis[10].

CASE REPORT

28 years female patient was admitted in general medicine department with the chief complaints of body pains since 1 week, insidious onset and gradually progressed, aggregated by walk and relived by rest, Fever since 1 week, weakness since 1 week. She was not known a hypertensive and diabetes patient. On general examination patient was conscious and coherent and her vitals were found to be, PR-80 bpm, BP-110/80 mm of Hg and her systems examinations were found to be CVS-S_1S_2+, CNS-not abnormalities, RS-BLAE+, RR-12cpm. On physical examination, patient is found to have hypersensitivity reactions on whole body, mainly abdomen and chest region. (Shown in Fig:1.) Laboratory examination of the patient was found to be Hemoglobin-12gm%, RBS-110mgs/dl, HIV-negative, Hb_sAg- negative, Malaria Parasite-negative, Widal Test-negative.



Figure :1 Ceftrioxone induced Hypersensitivity reactions (urticaria)

The patient was treated with following drugs on day 1, parental anti-biotic (ceftrioxone 1gm iv bd), parenteral anti-ulcer drug (pantaprazole 40mg iv bd), parenteral anti-pyretic (paracetamol 300mg im tid), oral vitamins (B.complex vitamin 67.5mg od). This treatment was continued up to 6 days. On day 2 patient developed mild hypersensitivity reactions, on day 3 and day 4 patient developed hypersensitivity reactions on whole body [Figure 1]. So on day5 we intimate to the physician about hypersentivity reactions caused by ceftriaxone and physician immediately stopped that drug, patient recovered from hypersentivity reactions after 10 days.

ADR analysis

After collecting past and current medication history from the patient it was suspected that the patient had developed drug induced hypersensitivity reactions. After analyzing the ADR profiles of all the drugs, it was found that the most suspected drug for producing hypersensitivity reactions was Ceftrioxone. We have further analyzed to establish the relationship between the drug and the observed ADRs, through causality assessment by using naranjo's scale, WHO-UMC ADR assessing scale as well as Karch and lasagna scale, results were shown in Table 01. We have also assessed the severity, predictability and preventability as a part of management through Modified Hartwig and Siegel severity scale, Schumock and Thornton Preventability Scaleresults were shown in Table 02

ADR Management

Generally, management of ADR includes withdrawal/suspension, dose reduction of suspected drug and administration of supportive therapy. Hear the suspected drug was withdrawn from the prescription, after 10 days patient was recovered from that reactions.

Table 1: causality assessment of suspected ADRs

S.No	Suspected Drug and Reaction (ADR)	Nariño's scale	WHO-UMC	Karch & Lasagna scale
1	Ceftrioxone induced hypersensitivity reactions	Probable	Probable	Probable

Table 02: Severity, Predictability, Preventability.

ADR	Drug involved	Severity	Predictability	Preventability
Ceftrioxone induced hypersensitivity reactions	Cefrtioxone	moderate level 4	Predictable (Type-B)	Probably preventable

DISCUSSION

Pharmacovigilance is defined as the science and activities involving to the detection, Understanding, assessment, and prevention of adverse drug reactions (ADRs) or any other drug related problems. ADRs can occur due to the use of multiple or concurrent drugs, drug interactions, and Possible in attention etc[11]. Drug explosion are common, comprising 10–30% of all reported adverse drug reactions[12]. B-Lactam antibiotics like cephalosporin's, Penicillin's and sulfonamides develop hypersensitivity reactions more commonly. Ceftriaxone is a third generation cephalosporin antibiotic, It is used commonly in adult patients and children for serious infections. Hypersensitivity reactions due to the ceftriaxone therapy are potentially serious[13]. Causality

assessment was also done and correlation was established by using Naranjo's scale WHO-UMC and Karch and Lasagna scale. Drug-induced urticaria frequently occurs due to antibiotics of which cephalosporin's were the mainly familiar causative drugs[14]. Cephalosporin induced hypersensitivity reactions may be immediate or non-immediate. Immediate reactions are IgE mediated reactions like urticaria, bronchospasm, Anaphylaxis and angio edema, which typically occurs within an hour of drug experience[15]. Non-immediate reactions are maculo papular or morbilliform rashes and delayed appearance of urticaria. Rashes or urticaria was the most frequently happening adverse reaction of intravenous Ceftriaxone[16].

CONCLUSION

Ceftriaxone which is used widely to treat various infections has ability to cause severe allergic reactions. Hence it is must to do skin test prior to administration of ceftriaxone or other beta lactam antibiotics.

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