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Streptomycin induced hypersensitivity reaction in patient diagnosed with tuberculosis

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Abstract

Streptomycin induced hypersensitive reaction is a very rare. However, it was reported in the form of itching, bronchospasm and breathlessness. A 58 Years old male patient present with chief complaints of anaphylactic reactions after 2 doses of intramuscular injection of Streptomycin-500mg and diagnosed as susceptible adverse drug reaction due to Streptomycin. He was prescribed with single dose of tablet Cetrizine- 5mg to subside complications. The case was critically analyzed by multiple specialists, reported and documented by pharmacovigilence committee of pharmacy practice department.

Keywords: Adverse reaction, Hypersensitivity, Pharmacovigilence, Streptomycin.

INTRODUCTION

Streptomycin induced hypersensitivity reactions are a rare, acute and potentially fatal anaphylactic reaction that often presents as a life-threatening medical emergency. Vestibiilar toxicity in the form of vertigo, ataxia, nystagmus is common with streptomycin. Skin rashes and pruritus have been observed as hypersensitivity reaction [1,2].

Streptomycin is a most vestibulotoxic, ototoxic and nephrotoxic. Ototoxicity and nephrotoxicity are more likely to be encountered when therapy is continued for more than 5 days, at higher doses. In very high doses, streptomycin can produce a curare-like effect with neuromuscular blockade that results in respiratory paralysis. This paralysis is usually reversible by calcium gluconate (given promptly) or neostigmine [3].

In general, the streptomycin has little allergenic potential; anaphylaxis and rash are unusual and occurs infrequently. Rare hypersensitivity reactions, including skin rashes, eosinophilia, fever, blood dyscrasias, angioedema, exfoliative dermatitis, stomatitis, and anaphylactic shock have been reported [4].

CASE REPORT

A 58 years male patient was admitted in Orthopedics department of tertiary care teaching hospital, on 4th January 2016 with chief complaints of pain over chest and lower backache since around 45 days. On admission he was prescribed with tablet ZERODOL-SP (containing, Acetaminophen- 500mg, Aceclofenac- 100mg, and Serratiopeptidase- 100mg), tablet Ranitidine- 150mg and tablet Calcium- 500mg in suitable regimen for 2 days. Later, the patient was diagnosed to have Pott's spine on the basis of objective evidences. The orthopedic department requested Revised National Antituberculosis Control Programme (RNTCP) department for their reference and start-up category-II antitubercular regimen.

The patient administered above mention drugs along with tablet Cefuroxime- 200mg, category-II antitubercular regimen consisting two tablet of Rifampicim- 600mg (R), two tablet of Isoniazide- 600mg (H), two tablet of Pyrizinamide- 1200mg (Z), two tablet of Ethambutol- 1200mg (E) and intramuscular injection of Streptomycin - 500mg (S) as alternative days regimen under close observation of RNTCP department and achieved good clinical response.

After 2 doses of category-II antitubercular regimen, patient presented with chief complaints of itching, breathlessness, chest tightness and bronchospasm and diagnosed as susceptible adverse reaction with streptomycin and requested to pharmacovigilence committee, the department of pharmacy practice for

further reference; mean while patient prescribed with tablet Cetrizine-5mg.

The pharmacovigilence committee member critically analyzed the case, evaluated sufficient scientific evidences and suggested as streptomycin induced hypersensitivity reaction. Finally patient prescribed with category-I antitubercular regimen consisting (RHZE) without (S) along with other supporting care.

Past Medical History

H/o Road traffic accident (RTA) around 45 days ago and admitted to the private hospital. The patient had showed severe injury to scalp, perital region and both hand.

Past Medication History

Patient got minor suturing and dressing and administered tablet amoxicillin- 500mg, analgesics, povidone ointment for topical application for management of same medical conditions.

Social History

No H/o alcohol consumption, smoking, tobacco in any form. Patient was moderately nourished, taking mixed diet and doing job as shopkeeper since 30 years. Patient was married and has 4 adult children.

On General Examination

patient alert and co-orporative; weight, 71 kg; height, 5'6''; blood pressure, 130/90 mmHg; heart rate, 70 beats/minutes; respiratory rate, 16 breaths/minutes and body temperature, 98.2°F.

Review of System

RS : B/L chest clear, No added sound
CVS : S1, S2 sound +, No murmur
P/A : Soft, Bowel sound +, bowel and bladder habit was normal & regular
CNS : Alert and co-operative

Laboratory Examination

On extensive laboratory investigation the physician found normal hematological test; biochemistry and cultural tests. The patient referred to physiotherapy department for their assistance and suggested as radiating vertebral pain probably due to tuberculosis. Finally, the patient asked for magnatic resonance imaging and found tuberculosis infective discitis between D4-D5. (Table 1)

Table: 1 Laboratory Examination

Test	Test value
Hematology	
Haemoglobin	12.4 gm%
WBC	7,300 cells/cumm
Neutrophil	52%
Lymphocyte	36%
Eosinophil	6%
Basophil	00%
Monocyte	7%
ESR	25 mm/hr
Biochemistry	
RBS	103 mg/dl
Urea	18 mg/dl
Serum creatinine	0.6 mg/dl
Other	
HIV	Non reactive
VDRL	Negative
HBsAg	Negative
Acid Fast Bacillus (AFB)	Negative
MRI SCAN	
MRI of Thoracic	Altered signal density between D4-D5
MRI of Cervix	Ostophyte complex between D5-D6, D3-D4
MRI of Lumber	Tuberculosis infective discitis between D4-D5

Management

Based upon subjective and objective evidences the patient was diagnosed to have pott's spine and prescribed with analgesics, acid suppressant, calcium supplement, empirical antimicrobial and cat-II antitubercular therapy for both systemic care (short term goal) and eradication of tubercular agent (long term goal). Patient achieved improvement on first week but further hypersensitivity reaction developed in the form of itching, bronchospasm and breathlessness. Suspecting that streptomycin may be the offending agent, the regimen was modified as dechallenging of streptomycin. Patient prescribed antihistamine immediately to subside fresh complaints. Patient started improvement and all untoward symptoms disappeared on next day. Patient got discharged after 15 days of hospital stay with necessary

documents and ask for the review/follow-up after 15 days on Out-patient department schedule.

Follow-up

On 5th February patient reported in Orthopedics Out-patient department where systemic review, medication adherence, prescribed regimen efficacy was monitored and found improvement. Patient was send to clinical pharmacist for counseling; to physiotherapy for feedback and also send to RNTCP for further medication chart.

DISCUSSION

Antitubercular treatment (ATT) exhibit greater level of efficacy with a satisfactory degree of toxicity; however combination treatment may produce severe adverse events [5]. There may be considerable morbidity, even mortality, particularly with drug-induced hepatitis [6].

Out of 511 patients, 93 patients developed 105 ADR (18.20%). Among 93 patients, four of them developed more than two adverse drug reactions [6]. Tak D. K. *et al*. conducted a study on "Safety evaluation of antitubercular therapy under revised national tuberculosis control programme in India" in which the incidence of ADR was found to be 17.02% [7].

Majority of adverse drug reaction due to intramuscular injection of Streptomycin was GI problems (38.09%), followed by skin reaction (30.48%), then hepatotoxicity (14.28%) [6]. However, among antitubercular drugs responsible for, serum sickness are mainly due to Streptomycin and PAS [8].

In this case study, uncommon, infrequent adverse drug reaction was found as hypersensitivity. Initially prescribing with Cat-I antitubercular regimen will be beneficial. However, RNTCP guidelines and complication of the disorder is a major concern. Withdrawal of streptomycin alone led to improvement. Concurrent regimen could not be blamed because subsequent administration did not produce symptoms.

Alertness of orthopedic department, analytical report by pathology and radiology department, suggestion of physiotherapy department, medication provided by RNTCP department and valuable participation by clinical pharmacist always plays vital role in any case management.

Conflict of Interest

No conflicts of interest declared.

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