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Case Report

Atropine Induced Psychosis: A Report of Two Cases

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ABSTRACT

Atropine is an anticholinergic agent which is used in the treatment of amblyopia, cardiac arrest, cyclopegic refraction, mydriasis induction, and organophosphate poisoning, pre-medication for anesthetic procedure and to treat toxic effects from eating mushrooms. Dryness of mouth, blurred vision, photophobia and tachycardia commonly occur with chronic administration of doses. In addition psychotic symptoms such as restlessness, excitement, hallucinations, delirium may occur with atropine. In this, we report two cases of organophosphate poisoning in which one patient is 32 years old female and the other is 35 years old male. These two patients consumed organophosphate compound and were admitted in the hospital. As such for treatment, atropine was used in both the cases. Post administration of atropine, the two patients shown psychotic symptoms. Then the clinicians came to a diagnosis of atropine induced psychosis and considered gradual reduction of doses of atropine and it was completely stopped after complete atropinisation. Subsequently to manage the psychiatric effects and calm the patient IV haloperidol was administered and supportive care was given with IV fluids. In the above two cases, no long term therapy is needed for patients and anticholinergic toxicity is likely to resolve within days of discontinuing the offending agent.

Key words: Atropine, organophosphate poisoning, psychosis

INTRODUCTION

Atropine is an anticholinergic agent which can be administered through IV, IM, ophthalmic and oral routes. FDA indicated uses include treatment for amblyopia, cardiac arrest, cyclopegic refraction, and mydriasis induction, organophosphate poisoning, pre-medication for anesthetic procedure and to treat toxic effect from eating mushrooms. [1] Most of the side effects of atropine are directly related to its anti-muscarinic action. Dryness of mouth, blurred vision, photophobia and tachycardia commonly occur with chronic administration of therapeutic doses. Anhidrosis also may occur and produce heat intolerance or impair temperature regulation in persons living in a hot environment. Constipation and difficulty in micturition may occur in elderly patients. Occasional hypersensitivity reactions have been observed especially skin rashes which in some instances progressed to exfoliation. In addition, psychotic symptoms such as restlessness, excitement, hallucinations, delirium may occur due to atropine. [2]

CASE REPORT

Case 1:

A female patient of 32 year old was admitted in the hospital with the chief complaints of alleged consumption of organophosphate compound (timate) due to severe abdominal pain to commit suicide and patient had vomiting. Quantity of compound consumed was unknown. Past medical and medical history along with the known allergies was nil. She is a

homemaker and helping his husband in agriculture. Patient was shifted to ICU (intensive care unit).

Patient was conscious, irritable, not oriented with a blood pressure of 110/80 mm of Hg, PR - 115 bpm, SpO_2 - 98% on room air. As an initial treatment stomach wash was done with normal saline, then Inj PAM (Pralidoxime) 1g BD, anticholinergic agent (atropine) 10ml/hr and symptomatically treated with Sucralfate syrup 10ml TID, intravenous Ceftriaxone 1g BD and IV Pantoprazole 40mg BD.

As such after the administration of atropine, patient started agitation, visual & auditory hallucinations, anxiety and dry mouth. All these symptoms were observed after the administration of atropine and hence a diagnosis of atropine induced psychosis was made. To manage the adverse drug reaction, the dose of atropine was progressively reduced to 8ml/hr, 6ml/hr, 5ml/hr, 3ml/hr, 2ml/hr, 1ml/hr & 0.5 ml/hr and finally stopped after the appearance of signs of complete atropinisation. Supportive care was given with IV fluids and blood glucose levels were monitored regularly. Intravenous haloperidol 5mg was given whenever required to manage psychiatric effects. To manage anxiety and to calm the patient, a combination tablet comprising of clonazepam 0.25mg and escitalopram 10mg. Finally patient was discharged in a much improved condition.

Case 2:

A male patient of 35 years old was admitted in the hospital with the chief complaints of alleged consumption of organophosphate compound 200ml outside his residence. He was first treated in government general hospital and then shifted to local private hospital. Past medical and medication history along with the known allergies were nil. He was a farmer. Patient was shifted to ICU.

Patient was conscious with altered sensorium and elevated blood pressure (150/100mm of Hg). As an initial treatment stomach wash was done with normal saline, then IV PAM 1 g TID, anticholinergic agent (atropine) 8ml/hr and symptomatically treated with syrup sucralfate 10ml TID, intravenous piperacillin + tazobactam (4.5g) BD, IV pantoprazole 40mg.

The patient started experiencing auditory & visual hallucinations, anxiety and agitation after the administration of atropine. Hence a diagnosis of atropine induced psychosis was made. To manage this adverse drug reaction the dose of atropine was gradually reduced to 1ml/hr & 0.5ml/hr, to manage the psychiatric effects and calm the patient IV midazolam 2mg, IV haloperidol 5mg was given. Supportive care was given with IV fluids and blood glucose levels were monitored regularly. After appearance of signs of complete atropinisation, atropine was stopped. Finally patient was discharged in a much improved condition.

ADR analysis:

After collecting past and present medication history from the patient ADR analysis was done by using Naranjo's scale, WHO-UMC ADR assessing scale and Karch & Lasagna scale, results were shown in table 1. We have also addressed the severity, predictability & preventability as a part of management through Modified Hartwig and Siegel scale, Shumock and Thornton preventability scale, results were shown in table 2.

ADR management:

Suspected drug dose was gradually reduced and finally stopped during which the psychotic symptoms were gradually decreased and the patient was discharged in a much stable condition.

Table 1: Causality of assessment of suspected drug

Case	Suspected drug	Suspected ADR	Naranjo's Scale	WHO-UMC	Karch & Lasagna scale
1.	Atropine	Psychosis	Probable ADR (6)	Probable ADR	Probable ADR
2.	Atropine	Psychosis	Probable ADR (6)	Probable ADR	Probable ADR

Table 2: Severity, Predictability and Preventability of suspected ADR

Case	Suspected drug	Suspected ADR	Severity	Predictability	Preventability
1	Atropine	Psychosis	Severe level (5)	Predictable ADR (type A)	Not preventable ADR
2	Atropine	Psychosis	Severe level (5)	Predictable ADR (type A)	Not preventable ADR

DISCUSSION

Atropine is an anticholinergic agent that acts as a competitive antagonist of the actions of acetylcholine and other muscarinic agonists; it competes for a common binding site on the muscarinic receptor. It is used in the treatment of organophosphate poisoning and was approved by FDA. Adverse drug reactions to atropine include cardiac dysrhythmia, tachyarrhythmia, dry skin, constipation, xerostomia, hypersensitivity reactions, somnolence, blurred vision, photophobia, restlessness, irritability, delirium, dissociative hallucinations and excitation. [1]

Toxic reaction to atropine results from its anticholinergic action and includes a variety of peripheral and central manifestations. This reaction is related to the considerable interpersonal variation in susceptibility to atropine (idiosyncrasy), so that toxic effects may occur at the usual therapeutic doses. [3] The interpersonal variation in relation to atropine toxicity is demonstrated by cases of death that have been reported following doses of 100mg or less for adults (and 10mg for children), on the other hand people have recovered from the intoxication with 1g dose of atropine. [4] Patients with Down's syndrome are abnormally sensitive to atropine. [5]

Generally adverse drug reactions are managed by withdrawal/ suspension, dose reduction of suspected drug, replacement of suspected drug and administration of supportive therapy. In the above two cases suspected drug (atropine) dose was gradually reduced and finally stopped after the appearance of signs of complete atropinisation. Replacement of drug (atropine) can be done by physostigmine, scopolamine and glycopyrolate.

Antipsychotics and antidepressants can be used as treatment for atropine induced psychosis. In the above two cases, no long term therapy is needed for patients and anticholinergic toxicity is likely to resolve within days of discontinuing the offending agent.

CONCLUSION

The administration of atropine for the treatment of intoxication carries the risk of allergic or toxic reactions in some of the patients. Thus the patients who are receiving atropine for the treatment of organophosphate poisoning should be closely monitored at regular intervals for the development of side effects, which help in prevention and better management of the condition. Hence, we the clinical pharmacists should play a key role in detecting, monitoring and managing of adverse drug reactions.

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