Organophosphorus Poisoning Requiring Very High Dose of Atropine: A Case Report

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ABSTRACT

Organophosphorous compounds are easily available in Nepal. Intake of op compounds is a commonest mode of suicide. Atropine, oximes and other supportive care are corner stones in management of op poisoning. We present a case report of an adult man with op poisoning requiring very high dose of atropine and treated successfully. Atropine in high dose is safe and effective antidote in management of op compound poisoning.

Keywords: OP compound; atropine.

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INTRODUCTION

Organophosphorus (OP) compounds are commonly used as pesticides in Nepal. Easy availability in local market has made it common agent for self-harm. OP intoxication occurs following absorption through GI or respiratory mucosa, skin and intravenous or intramuscular route in rare cases.[1] These compounds inhibit acetyl cholinesterase leading to cholinergic crisis.[2] The diagnosis of op intoxication is done clinically. Various muscarinic, nicotinic and CNS effects of OP compounds are seen. Atropine is main antidote of OP compound poisoning. Atropine acts by blocking the acetylcholine receptors and prevents the effects of acetylcholine excess.[3]

CASE PRESENTATION

All procedures carried out in the management of the case were in accordance with ethical standards of the institution. Written informed consent was taken for publication of the case from both patient and his daughter. A copy of the written consent is available for review with the editorial team. Forty-eight years old adult male was brought to emergency (ER) by his wife with complaint of loose stool and vomiting for last two days. He was treated in nearby clinic with iv fluids and antibiotics with diagnosis of acute gastroenteritis and was discharged on oral antibiotics and oral rehydrant solution. Patient was a regular alcohol consumer. After going to home patient was having profuse diarrhea and vomiting so they brought patient to our center. He has history of intake of rat poison twenty years ago.

Table 1. Vital signs at presentation in emergency.

Blood pressure	100/ 70 mm of Hg
Pulse	83 bpm
SpO_2	94% in room air
Temperature	98 F
Random blood glucose (glucometer)	112 mg%
Pupils	b/l 3mm

Atropine challenge test with 2 ml of atropine was done in ER which was negative. Patient was shifted to ICU for observation. Patient was stable till next day morning. But there was exaggerated bowel sounds with oral secretions and wheezing. We were not satisfied with the clinical course of the patient. And decided to search any OTC agents taken. Blood sample was taken for serum cholinesterase level.

Again, atropine challenge done but there was no sustained tachycardia. This made us to suspect op compound intake. On further asking his wife suspects him of intake of some poison which he threatened during a dispute with her two days back. We talked to his family members in village in phone to have a look of any empty vessels of chemicals nearby. Unfortunately, a container levelled ALL FIGHTER (chlorpyrifos) was found there. The result of serum cholinesterase level came and it was found low. (800 U/Lt Ref: 5400-13200).

We decided to atropinize the patient. We maintained atropine infusion at 140 ml per hr. in the morning however his pulse rate was 88 to 90 bpm. In the evening pulse rate dropped to 40 bpm and atropine infusion was increased to 350 ml per hour. Despite that amount of atropine patient has heart rate of 70 to 75 bpm. Still bowel sounds and wheezing were persisting. We kept on increasing infusion rate of atropine and reached up to 620 ml per hour. The patient condition was deteriorating with shallow breathing, falling oxygen saturation and muscle fasciculation. ABG showed respiratory acidosis Diagnosis of intermediate syndrome was made and patient was kept in ventilator on sixth day of admission in ICU and kept in volume-controlled mode. That day patient was getting 14.88 liters atropine per 24 hours). All IV fluids were then stopped and patient was given diuretics due to volume overload by atropine alone. Patient was transfused two pints of fresh frozen plasma too. Patient was extubated on 7th day after intubation. Even after extubation we could not decrease dose of atropine daily. It was done only on clinical grounds and atropine was stopped on 30th day of hospital admission. Patient was shifted to medical ward on 31st day and discharged in 35th day of admission. Patient came in follow up in medical OPD after two weeks with her daughter. He was consulted in psychiatry department where a diagnosis of BPAD was made and medications were started.

DISCUSSION

Organophosphorous compounds are widely used in Nepal for agriculture and domestic purposes. Gunnel et al. report approximately 30% of suicide case globally to be caused by op intoxication.[4] The overall prevalence of op poisoning in Nepal is 36.7%.[5] In our patient a number of factors may have contributed to prolonged hospitalization and large dose of antidote. First factor was misdiagnosis as acute gastro enteritis for initial two days which were crucial to prevent significant absorption through gastric lavage. Similarly, adulteration with alcohol, obese patient, ingestion of large amount of op compound are possible factors. Second thing is that 2PAM was administered later only. The dose of atropine required in management of op poisoning is variable. Ali karakas et.al. reported that maximum amount of atropine given was 100 mg iv on admission and 100 mg/hr./day.[6] similarly Francis N. et al. reported a severe op poisoning case requiring atropine infusion for 35 days and range of daily atropine doses was 170 mg to 3600 mg.[3] Amount of atropine infused in our patient may be one of the highest reported dose in op poisoning. A randomized controlled trial showed that early use of fresh frozen plasma in moderate and severe case of op poisoning significantly reduces the total dose of atropine and oximes, duration of hospital stay and requirement of mechanical ventilation.[7] We had transfused two packets of FFP(Fresh frozen plasma) after development of intermediate syndrome in this patient. However, we are not certain whether that FFP helped in saving our patient or not.

CONCLUSIONS

OP compound intake should be suspected in selected patients presenting with alcohol intoxication. Atropine challenge test should be carried out in all suspected cases. Atropine may be required in very high doses and for prolonged period in those presenting lately in hospital. Very high doses of atropine is found safe in patients presenting with op compound poisoning. There should always be effort of clinician for early suspicion, early diagnosis and early and adequate atropinization of patients presenting with OP compound.

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