

Amlodipine overdose with hypotension and noncardiogenic pulmonary edema.

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Abstract

Amlodipine overdose can be a life threatening situation when it is manifested as noncardiogenic pulmonary edema. Treatment remains challenging when it is complicated with refractory hypotension and pulmonary edema. Here we describe a 23 year old female with history of ingestion of 45 tabs (5mg) of amlodipine as a suicidal intent and presented within 36 hours to the hospital. High flow oxygen, iv fluids, calcium gluconate infusion and antibiotics were used for the management. After 7 days of hospital stay, patient was discharged with full recovery.

Key words: Amlodipine, Hypotension, Noncardiogenic Pulmonary edema

Introduction

Amlodipine is a common drug prescribed for hypertension and angina.¹ Amlodipine, a dihydropyridine group of calcium channel blockers (CCBs), constitutes the leading form of cardiovascular drug overdose and has been implicated in several deaths resulting from such overdose.²

Amlodipine is a dihydropyridine group of CCB with half life of 30-50 hours and a large volume of distribution (21 L/Kg).³ Treating patients with overdose of this medicine can be challenging even for the most experienced physician. The difficulty arises because patients severely poisoned with CCB may have profound refractory bradycardia, hypotension, acute kidney injury and either cardiogenic or noncardiogenic pulmonary edema.

Here we report a case of amlodipine overdose with non cardiogenic pulmonary edema without refractory hypotension which was managed supportively.

Case Report

A 23 yrs old housewife presented to emergency room (ER) after 36 hours of ingestion of 45 tabs of 5mg amlodipine (220mg). She complained of multiple episodes of vomiting, facial puffiness along with dizziness. On examination, she was conscious, alert and well oriented. Her heart rate was 130/min, regular, SPO₂ was 94% in room air and blood pressure was 80/60 mmHg. Clinical examination revealed no murmur, gallop and chest was clear with no added sounds. She denied consumption of alcohol or any other drugs. There was no signs

of head trauma or focal neurological signs. Her initial CBC, renal function tests and electrolytes were unremarkable. Her ABG report showed PH- 7.48, P_{CO2}-26 mm Hg, P_{O2}-70mmHg (mild hypoxemia and respiratory alkalosis). The lactate level was 0.8 mmol/L, chloride-110mmol/l and calcium level 1.10mmol/l. ECG showed - sinus tachycardia with ST segment depression in lead II, III aVF and V3-V6. Cardiac markers were negative. Chest X-ray and USG abdomen revealed no significant abnormality on admission. She was continued on IV Normal saline at 50 ml/hr and after 12 hours of hospital admission, she developed marked breathlessness with respiratory distress and chest revealed diffuse lung crackles with persistent hypotension and BP dropped to 70/50 mmHg. She was shifted to ICU and treated with high flow oxygen, bronchodilators and iv diuretic. Echocardiogram revealed normal LV and RV function, with mild pericardial effusion. Repeat Chest X-ray showed bilateral fluffy opacities and left sided pleural effusion. In addition to the resuscitative measures, the patient was given 10% Calcium Gluconate over 10 min followed by repeated boluses of Calcium gluconate three times a day along with i.v. antibiotics (tazobactam and piperacillin with levofloxacin) and i.v fluids. Her blood and urine culture showed no growth. Over the next 48h, she showed gradual improvement in her clinical condition with decreasing oxygen requirements. Calcium gluconate was ceased after 72h of admission. On day seven, she was discharged in good health and referred for psychiatric evaluation.



Fig 1: Chest X-ray after admission and at discharge .**

Discussion

Amlodipine overdoses may currently be a rare presentation, but with an increasing number of people treated with CCBs, these cases may become more challenging . Amlodipine is a dihydropyridine group of CCBs with a half life of 30-50 hours and a large volume of distribution. It has predominant effect on vascular smooth muscle cells with little effect on cardiac pacemaker cells and cardiac contractility .^{4,5} In our case , patient developed transient hypotension along with non cardiogenic pulmonary edema after 48 hours of ingestion of amlodipine.

Acute non-cardiogenic pulmonary edema, hypodynamic shock and hyperglycaemia are recognised complications of CCB overdose. Some cases with catastrophic shock and noncardiogenic pulmonary edema were reported.^{6,7} The mechanism of non-cardiogenic pulmonary edema in patients with CCB overdose is not well known. The blockade of L-type calcium channels in smooth muscle and myocardial depressant activity at toxic levels can result in cardiogenic pulmonary edema. Excessive pulmonary capillary transudation due to selective precapillary vasodilatation causes an increase in transcapillary hydrostatic pressure and ultimately interstitial edema which explains the non cardiogenic pulmonary edema. ^{8,9}

Our case was complicated by transient pulmonary edema which might have resulted from the combined effects of the drug itself, prolonged hypotension and fluid resuscitation during the initial phase of therapy. Normal cardiac function on echocardiography, excluded myocardial depression as an etiologic factor.

There is no standardized guideline for management of amlodipine intoxication.¹⁰ Gastrointestinal decontamination in amlodipine overdose is beneficial when used within the one hour of consumption.¹¹ Pharmacologic therapies available for amlodipine overdose with persistent hypotension or myocardial depression include inotropic support with adrenergic agents, glucagon, IV infusion of calcium and extracorporeal membrane oxygenation in refractory shock. ^{11,12,13}

Our patient developed hypotension and pulmonary edema which was managed supportively with iv fluids , calcium infusion and high flow oxygen .

Conclusion:

Amlodipine Overdose can present with prolonged hypotension and in severe cases with pulmonary edema and refractory shock . Fluid resuscitation should be well judged clinically and not to precipitate pulmonary edema . We present a case of amlodipine overdose where it is complicated with hypotension and non cardiogenic pulmonary edema ,which was managed with supportive measures .

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