

**Yoğun Takip Gerektiren Bir Zehirlenme Vakası; Amlodipin İntoksikasyonu***Amlodipine Intoxication: A Poisoning Case Requiring Intensive Follow-Up*Mansur Kürşad Erkuran<sup>1</sup>, Erhan Düzenli<sup>2</sup>, Tarık Ocak<sup>1</sup>, Arif Duran<sup>1</sup>, Hakan Bayır<sup>3</sup><sup>1</sup>Abant İzzet Baysal Üniversitesi Tıp Fakültesi, Acil Tıp Ana Bilim Dalı, Bolu<sup>2</sup>Şanlıurfa Mehmet Akif İnan Eğitim Araştırma Hastanesi, Acil Tıp Kliniği, Şanlıurfa<sup>3</sup>Abant İzzet Baysal Üniversitesi Tıp Fakültesi, Anesteziyoloji Ve Reanimasyon Ana Bilim Dalı, Bolu**Özet**

Kalsiyum kanal blokeri; hipertansiyon, aritmi ve koroner kalp hastalıklarında kullanılan, hücre zarında bulunan L tipi kalsiyum kanallarını bloke eden ilaçlardır. Yüksek konsantrasyonlarda kalsiyum kanalları bloke olur ve L tipi kanallardan kalsiyum girişi tamamen engellenir. Yazımızda yüksek doz kalsiyum kanal blokeri alım sonrasında acil servise başvuran hastanın taburculuğuna kadar olan dönemdeki klinik durumundaki değişimler ve tedavi yaklaşımlarının sunulması amaçlanmıştır.

**Abstract**

Calcium channel blockers are drugs used in hypertension, arrhythmia and coronary heart diseases by blocking L type calcium channels. At high concentrations, calcium channels are blocked and calcium entry from L type channels is totally prevented.. In our study, we aimed to present the changes and the treatment approaches for the hospitalization period of a patient who applied to the emergency unit following the intake of high dose of calcium channel blocker, until the discharge.

**Anahtar Kelimeler:** ilaç intoksikasyonu, kalsiyum kanal blokeri, yakın hemodinamik takip

**Keywords:** Drug intoxication, calcium channel blockers, accurate hemodynamic follow-up.

**Introduction**

Calcium channel blockers are medications which are used for arrhythmias and hypertension thanks to their effects of disrupting movement of calcium through L-type calcium channels. There are two types of calcium channel located on cell membranes as L- type and T- type calcium channels. Therapeutic doses of CCBs block out calcium channels by linking to alpha subunit of L-type calcium channels in cell membranes and CCBs show their effects by reducing calcium influx (1). Calcium channels are blocked in high concentrations of CCBs and calcium influx is completely inhibited. Toxic doses of CCBs can cause metabolic acidosis, hyperglycemia, hypotension, atrioventricular block and high rate of mortality (2). In our study, we aimed to present treatment approach and clinical

situation changes of patient from applying to emergency unit after taking high-dose of CCB till discharge.

**Case report**

A patient, who was brought to our emergency unit by 112 emergency unit, has applied to another hospital because of taking high-dose medication. 18 year old female patient has taken 30 pieces of Amlodipin (5mg) at 18:30. After the patient was brought to public hospital at 20:00, gastric lavage and activated charcoal has been performed. The patient applied to our emergency unit at nearly 23:00 and she was conscious, cooperative and oriented. Vital signs were noted as ; blood pressure :90/50 mmHg, pulse: 88/min, respiratory frequency: 12/min and temperature : 37.2 °C. Urinary catheterization was ensured and saline



solution infusion was began to be given as 50 cc/h. The patient was hospitalized to Intensive Care Unit (ICU) due to intoxication of CCB. Because of the distinct hypotension, Dopamine infusion of 20 mcg/kg/min and Dobutamine infusion of 10 mcg/kg/min was started. Hypotension remained and Adrenaline infusion of 20 mcg/kg/min was started. Blood glucose was measured as 500 mg/dL and Insulin infusion was started to the patient. Hemofiltration was began to perform because of oliguria. Despite oxygen administered as 6 L/min, the patient had tachypnea and metabolic acidosis was detected by arterial blood gas. Mechanical ventilation support was provided due to these problems. Infusion of Dopamine 20 mcg/kg/min, Dobutamine 10 mcg/kg/min and Adrenaline 20 mcg/kg/min was resumed due to ongoing hypotension. Infusion of Dopamine, Dobutamine and Adrenaline was stopped in the fourth day in ICU because the blood pressure began to be normal. The patient was extubated and then discharged with recovery.

### Discussion

CCBs are responsible of %48 of deaths related to drug intoxication affecting cardiovascular system (3). Besides their therapeutic potentiality, CCBs have toxic effects leading to serious clinical results if taken high doses. Amlodipine is a Dihydropyridine calcium antagonist which is used for treatment of hypertension and angina pectoris (4). Amlodipine is slowly absorbed while taken orally and reaches to plasma peak concentration at 6-9 hours, its half-life is 30-50 hours.

Dihydropyridine calcium channel blockers cause vasodilation because they are selective to vascular structures but they don't lead to dysfunction about conduction system and cardiac muscle (5). Amlodipine that is a Dihydropyridine calcium channel blocker, shows its effects

over blood vessels in therapeutic doses whereas this selectivity is lost in high doses (6).

Toxic effects of CCBs appear late because they are generally long-acting and their metabolic clearance is low (7).

Intoxications with CCBs have to be realized in time otherwise clinical situation of victims can worsen and this type of intoxication even can be mortal.

Providing supportive care, reducing drug absorption and improving cardiac functions with cardiotoxic agents are the basis of treatment approach to intoxications with CCBs. Supportive care involves ensuring of airway, appropriate ventilation and hemodynamic monitorization (8). Gastric lavage must be performed and activated charcoal must be given to reduce absorption and to increase secretion (9).

Bradycardia, hypotension, hyperglycemia, metabolic acidosis and mental status changes can be seen in intoxications with CCBs (10). Inadequate tissue perfusion due to deep resistant hypotension can lead to end organ damage. Clinical signs and symptoms depend on whether perfusion is ineffective or not. Oliguria may occur for lack of kidney perfusion (11) and hemodialysis may require as it was also necessary for our patient. Catecholamines can be used to improve tissue perfusion especially if hypotension resists. Catecholamines promote systemic perfusion by increasing heart rate, stroke volume and cardiac output (10).

Hyperglycemia is often seen in intoxications with CCBs due to dysfunction of insulin secretion and increase at peripheral insulin resistance (12). High-dose glucose/insulin infusion must be given as intravenous to maintain normal blood glucose levels (10). Hypotension,



bradycardia and oliguria are beneficial signs for differential diagnosis (13).

### Conclusion

As a result, it mustn't be forgotten that clinical situation of patients suffering from intoxication with CCBs can worsen and end organ damage can occur related to inefficient tissue perfusion. Mortal complications are inevitable unless intoxication is realized in early stages. Therefore, close hemodynamic follow up is essential for these patients in ICU.

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