

INTRODUCTION

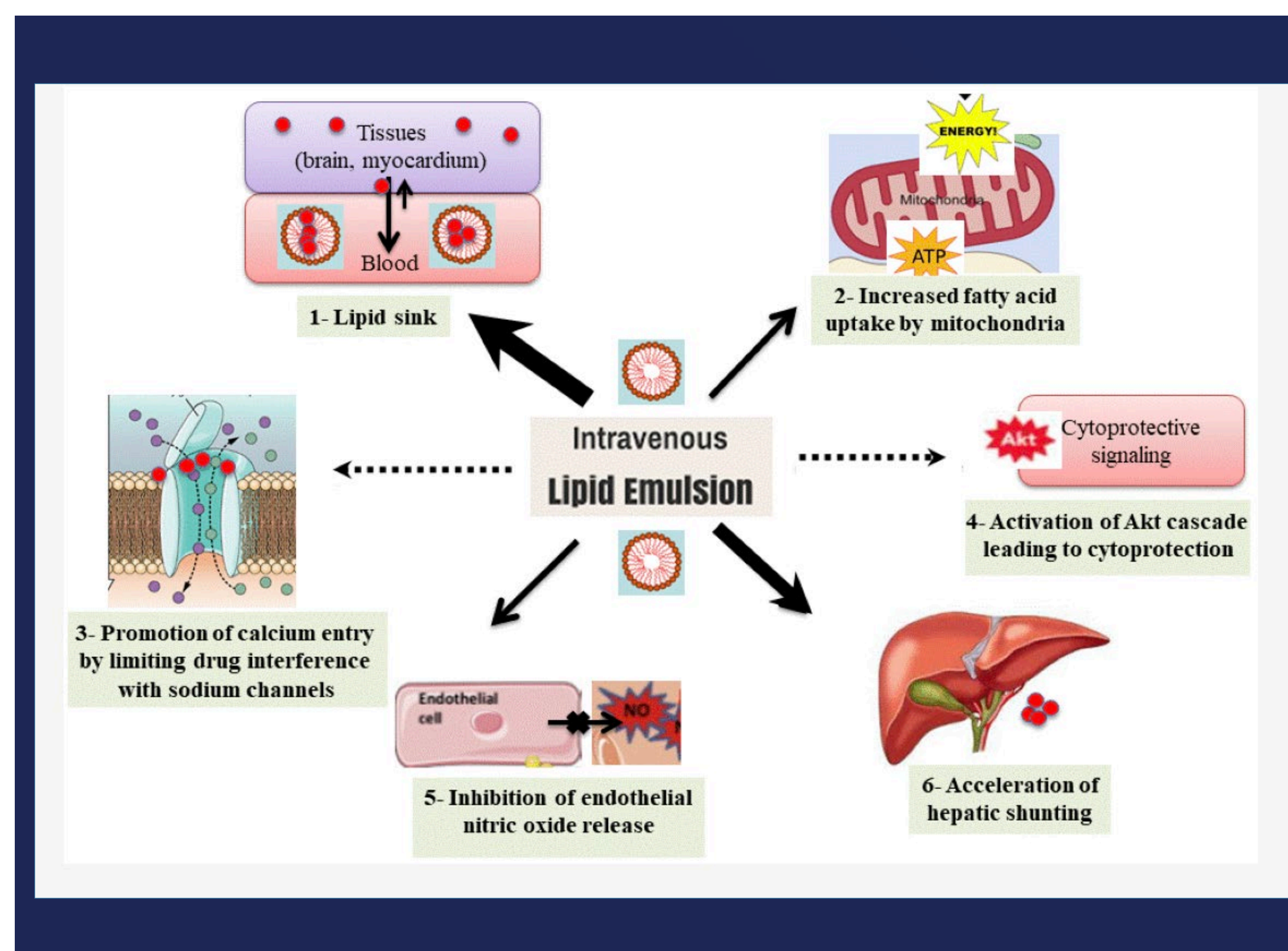
Diphenhydramine is a commonly-used, first generation antihistamine with strong anticholinergic properties. We present the case of a 40-year-old male who presented after intentional overdose from diphenhydramine, who was successfully treated with intravenous lipid emulsion therapy.

CASE REPORT

A 40-year-old male with no medical history presented to the hospital after being found semi-conscious and exhibiting seizure-like activity. The patient was emergently intubated for airway protection. The patient's initial electrocardiogram exhibited a widened QRS complex and prolonged QTc interval. Initial arterial blood gas (ABG) revealed a pH of 6.66, pCO₂ of 123 mmHg, pO₂ of 131 mmHg, and a bicarbonate of 13 mEq/L. Sequential administrations of bicarbonate and calcium were dispensed. The patient experienced two cardiac arrests, but return of spontaneous circulation (ROSC) was achieved both times with effective cardiopulmonary resuscitation, along with multiple administrations of epinephrine, bicarbonate, and calcium. He was started on a bicarbonate infusion. Post-cardiac arrest electrocardiogram showed persistently widened QRS complex and prolonged QTc interval. After discussing with poison control, the decision was made to treat with intravenous lipid emulsion to try to prevent further cardiac arrests. In the medical intensive care unit, subsequent cardiac monitoring and electrocardiogram showed markedly improved rhythm, and repeat ABG showed pH of 7.36, pCO₂ of 38 mmHg, pO₂ of 187 mmHg, and bicarbonate of 21 mEq/L. Patient regained consciousness the same morning. He was extubated within 48 hours of presentation and ultimately recovered fully from his condition.

DISCUSSION

Overdose of diphenhydramine can cause severe effects like delirium, seizures, and death. On average, a lethal dose is 2,400 mg, though this is dependent on age and body weight. This patient ingested around 28,000 mg. High diphenhydramine levels block sodium channels, which can lead to life-threatening arrhythmias. Despite using conventional supportive methods, such as bicarbonate and calcium, his cardiac rhythm did not improve. Subsequent electrocardiograms showed persistently widened QRS complex and prolonged QTc. After discussing with poison control colleagues, the decision was made to treat with lipid emulsion therapy. Lipid emulsion acts as a "lipid sink," attracting the highly lipophilic diphenhydramine molecules away from sodium channels and allowing for excretion. In our patient, use of lipid emulsion likely led to the rapid normalization of the QRS complex, shortening of the QTc interval, and ultimately aided in his survival.



CONCLUSION

There have been only a few case reports documenting the use of lipid emulsion therapy in the treatment of diphenhydramine overdose. While supportive treatment is the standard of care for diphenhydramine overdose, severe toxicity should prompt consideration of the use of lipid emulsion therapy.

MANAGEMENT

Treatment in some cases will involve removing the nasal balloons or packings and terminating manual pressure to the nares to stop the stimulation of afferent trigeminal neurons, preventing further incidence. In conclusion, having a high index of suspicion for possible TCR stimulation allows providers to be prepared for subsequent hemodynamic compromise, ensuring patient safety.

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