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Severe TCA Toxicity: The Race Against Time

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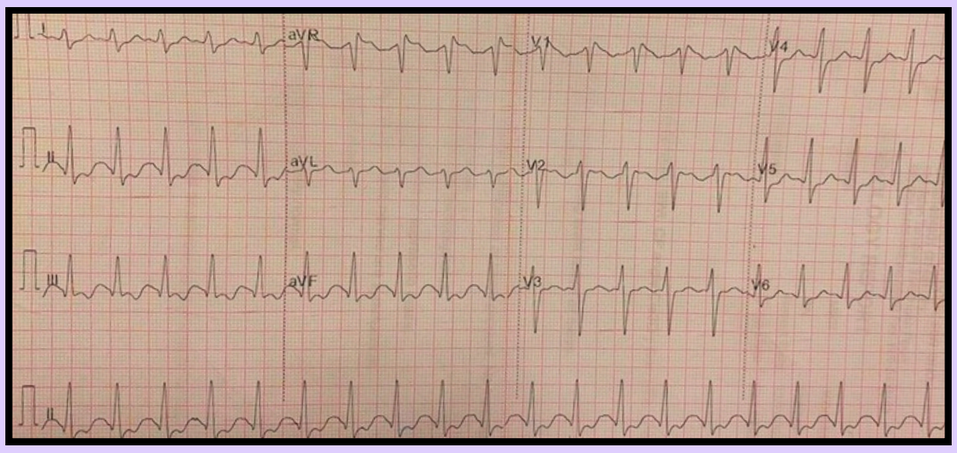
01 INTRODUCTION

Tricyclic antidepressant (TCA) toxicity is a life-threatening emergency due to its narrow therapeutic index, requiring rapid recognition and intervention. Severe toxicity can lead to life-threatening arrhythmias, seizures, CNS depression and profound hypotension, making early diagnosis crucial. Prompt treatment with sodium bicarbonate and supportive measures can significantly reduce morbidity and mortality.

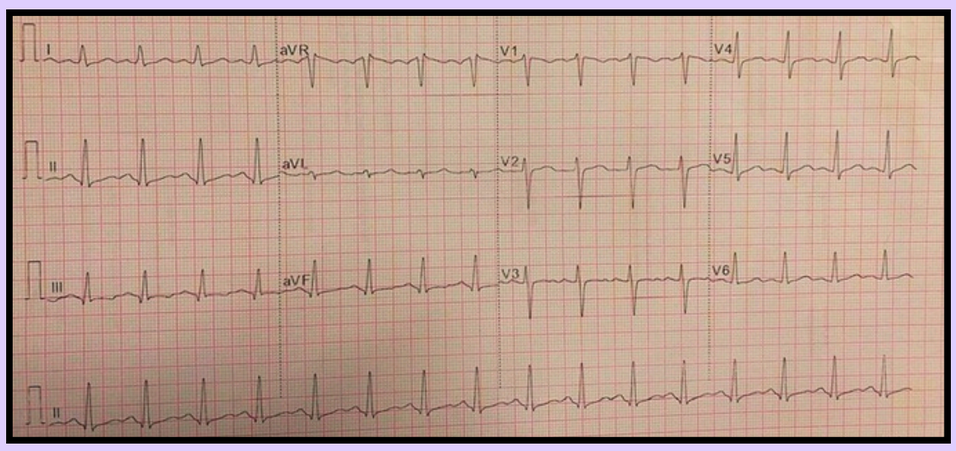
02 CASE DESCRIPTION

A 23-year-old lady with underlying migraine on Amitriptyline, presented to ED with sudden onset of headache and less responsive. Initial vital signs noted BP 129/83, HR 121, SpO2 99% RA, afebrile. Her GCS was E1V1M3 with bilateral pinpoint pupils. Neurological examination revealed generalized hypertonia and hyperreflexia with clonus and bilateral upgoing plantar reflexes. ECG showed widened QRS complexes of 164 msecs, prolonged QT interval of 509 msec, RSR' pattern and RBBB. Due to her poor GCS recovery, she was intubated for airway protection. Urgent CT Brain showed cerebral edema over right temporal lobe.



ECG on arrival: widened QRS, prolonged QT interval, RSR', RBBB

Concomitant additional history from patient's friend revealed that she had been struggling with depression following the recent death of a close family member and intentionally ingested approximately 20 tablets of Amitriptyline (25 mg each) 2 hours before presentation. ABG showed pH 7.34, pCO2 38.3, pO2 97.8, bicarbonate 20.5, BE -4.7, lactate 2.79. Hence immediate IV sodium bicarbonate 4.2% 200 ml was administered promptly, along with hypokalemia and hypomagnesemia corrections.



ECG post-sodium bicarbonate: narrowing QRS, QT interval normalized

Following administration of sodium bicarbonate therapy, the patient's hemodynamics improved, and her lactate level decreased gradually. Repeated ECG also showed progressive narrowing of the QRS complexes. She was subsequently admitted to the ICU, extubated on Day 2, and discharged with neurologically intact 2 days later.

03 DISCUSSION

This case underscores the hallmark complications of severe TCA overdose, including altered mental status and cardiac involvement. Given her severe clinical presentation and ECG findings, early administration of IV sodium bicarbonate was crucial in improving her outcome.

Intravenous Sodium bicarbonate therapy with close continuous cardiac monitoring remains the mainstay of treatment in TCA toxicity, particularly when the QRS duration exceeds 100msec, as it induces alkalosis and provides a sodium load that enhances cardiac conduction.

04 CONCLUSION

Every second counts - early recognition, rapid ECG assessment, and immediate intervention not only save lives and reverse initial complications, but also lead to significantly better neurological recovery and improves long term outcomes.

05 REFERENCES

1. Goldfrank's Toxicologic Emergencies. 11th edition New York: McGraw-Hill Education; 2019.
2. Sodium Bicarbonate Use in Tricyclic Antidepressant (TCA) Overdose. American College of Medical Toxicology (ACMT) Toxicology Visual Pearls, 2020.
3. Tricyclic antidepressant (TCA) poisoning: cardiovascular (CVS) toxicity. Toxicol Rev 2005;24(3):205–214.

CT Brain: Cerebral edema over right temporal lobe