EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

BROWARD HEALTH
Care Warriors

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TCA Overdose

A 51-year old male presents to hospital 5 hours after ingesting approximately 60 tablets of amitriptyline (50 mg tablets). Upon arrival in the ED he is confused and combative. Initial vital signs are BP 55/30 to 93/60, HR 135, RR 24, Temperature 37.4. Capillary glucose is normal.

Q1) What EKG findings would you expect to see?

A. Wide complex tachycardia with QTc prolongation

B. Junctional Bradycardia with no P waves

C. Ventricular bigeminy with frequent ectopics

Q2) What is the best initial treatment?

A) 1L bolus of NS and Magnesium sulfate infusion

B) 1L bolus of NS and 3 amps (150 mEq) of bicarbonate

C) DC Cardioversion

Pharmacodynamics of TCA

1) Norepinephrine reuptake inhibitor

2) Sodium channel blockade

3) Alpha adrenergic receptor blocker

4) Anticholinergic effects

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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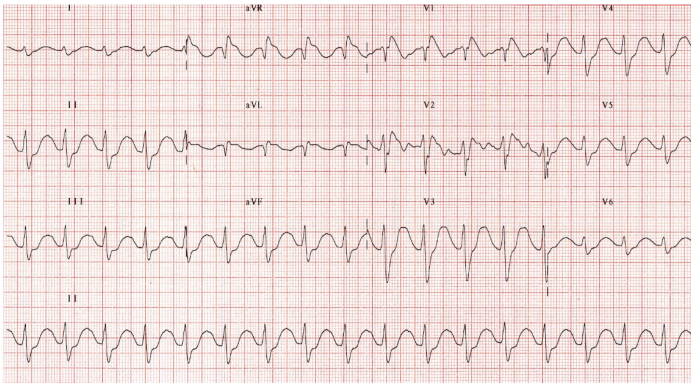
Ans 1) The correct answer is A.
The following combination is highly suspicious for a Na+ Channel Blocker overdose, of which TCA is a classic example.

- Wide complex tachycardia (>120ms) with a right axis deviation
- Tall R wave in lead aVR
- QTc prolongation



Ans 2) The correct answer is B
There are multiple proposed mechanisms to explain the benefit of sodium bicarbonate therapy in tricyclic antidepressant (TCA) overdose. The most commonly cited are:

- Increases the sodium gradient across the cardiac fast acting sodium channels which overwhelms blockade by the TCA allowing for return of the rapid rise of phase 0 of the ventricular action potential

- Raises serum pH which removes the TCA from the binding site on the sodium channel as the majority of drug binding to sodium channels occurs in the ionized state

➢ What Labs to get?

- Blood gas: pH status while giving sodium bicarbonate, lactate as a marker of hypoperfusion
- Co-ingestions: salicylate and acetaminophen levels
- Basic metabolic panel: evaluate electrolytes, renal function
- Hepatic panel: evaluate liver function
- Obtaining a TCA concentration is not necessary as they are delayed and, patients are not treated based on concentration but rather on effect of the drug (Etzner, et.al).

For a list of educational lectures, grand rounds, workshops, and didactics please visit ***BrowardER.com*** and **click** on the ***"Conference"*** **link**.

All are welcome to attend!

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➢ ED Management

- Supportive Care- Assess airway, breathing and circulation
- Large bore IV X 2, supplemental O2 if needed and continuous cardiac monitoring
- Intravenous crystalloid fluids
- Sodium Bicarbonate- Bolus 1-2mEq/kg until the QRS narrows to <100ms and hypotension improves
- Aim for a pH below 7.55
- If patient is intubated, can use mechanical ventilation to control pH
- Gastrointestinal Decontamination- Activated charcoal for awake and alert patients following commands
- Orogastric lavage for intubated patients
  - Benefit not proven in a controlled trial
  - Delayed gastric emptying from anticholinergic properties may increase benefit of lavage (Kerr, et.al)

Take Home Points

- TCA toxicity can be fatal. Prompt recognition and treatment can significantly reduce mortality
- EKG findings can be pathognomonic and include QRS widening (> 100 msec) and rightward deviation of the terminal 40ms
- First line treatment is $NaHCO_3$ 1-2 mEq/kg
- In patients with significant hypotension, beside echocardiogram to evaluate for cardiac contractility can help guide pressor and inotrope treatment

ABOUT THE AUTHOR

This month's case was written by Madiha Ahmed. Madiha is a 4th year medical student from FIU-HWCOM. She did her emergency medicine rotation at BHMC in Sept 2019.

REFERENCES

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