

# **DIGOXIN OVERDOSE**

*(Last updated October 2020; Reviewer: Tabinda Jawaid, MBBS; Aysun Tekin, MD; Ognjen Gajic, MD)*

**PRESENTING COMPLAINT:** Palpitations, nausea, vomiting, drowsiness.

## **FINDINGS**

- A Check airway
- B N/↑ breathing
- C ↓/↑HR, ↓BP
- D Altered variable (V,P,U,D)\* drowsiness, lethargy, confusion, hallucinations, rarely seizures might occur
- E Abdominal tenderness
- L<sub>PC</sub> ↑ potassium, magnesium, BUN, creatinine
- U<sub>PC</sub> normal echocardiogram

\* V (verbal), P (pain), D (delirious)

PC: (point-of care)

## **OTHER HISTORY**

### **Signs and symptoms**

- Neurological: altered mental status, lethargy
- Arrhythmias: any type
- Hypotension
- Gastrointestinal: anorexia, nausea/vomiting, abdominal pain

**Predisposing conditions:**

- Chronic kidney disease
- Patients with systolic and diastolic heart failure who takes digoxin chronically
- Elderly
- Atrial Fibrillation

**DIFFERENTIAL DIAGNOSIS**

- Beta blocker toxicity
- Calcium channel blocker toxicity
- Alpha receptor agonist toxicity

**OTHER INVESTIGATIONS****Labs:**

- Serum digoxin level:
  - Therapeutic range is 0.8 to 2ng/mL (1 to 2.6 nmol/L)
  - Toxicity level is >2ng/ml (>2.6 nmol/L)
- Serum potassium level
- Serum magnesium level
- BUN/creatinine
- Urine toxicology screen
- Acetaminophen and salicylate levels to rule out common co-ingestants.

**ECG abnormalities:**

- Sinus bradycardia (most common and one of the earliest signs)
- AV blocks (first, second, or third degree)
- Atrial tachycardia
- Atrial fibrillation and flutter
- Junctional rhythm
- Ventricular premature beats

- Ventricular tachycardia/fibrillation

**Monitoring:**

- Continuous cardiac monitoring
- Potassium level
- Magnesium level

**THERAPEUTIC INTERVENTIONS**

**General:**

- Assess airway, breathing, circulation. Stabilize as necessary.

**Medications:**

- If patient presents to ED within 1-2 hours of ingestion of digoxin, may give activated charcoal (AC) as an adjunctive therapy.
  - Ensure patient is alert and able to protect his or her own airway.
- Digoxin-specific antibody (Fab) fragments for:
  - Hyperkalemia (>5.5 meq/L)
  - End-organ damage (AKI, altered mental status)
  - Life-threatening or hemodynamically unstable arrhythmias such as ventricular tachycardia, ventricular fibrillation, asystole, mobitz II heart block, symptomatic bradycardia.
  - Dosing:
    - If neither amount of digoxin ingested or digoxin level is known: 10 vials of Fab fragments.
    - If serum digoxin level is known: # vials Fab = serum [digoxin in ng/ml] x weight (kg)/100 (round to the nearest whole number).
    - If amount of digoxin is known, but not serum digoxin level: Calculate total body load (TBL) = dose (mg) x 0.8, # vials Fab = TBL/0.5
  - Give Fab fragments over 30 minutes infusion. In cardiac arrest, may give as a slow IV push
- If Fab fragments are not immediately available:

- Atropine 0.5mg IV can be used for bradyarrhythmias
- Fluid boluses can be given for hypotension

**Procedures:**

- Continue cardiac monitoring
- Serial ECGs
- Digoxin is not dialyzable due to large volume distribution

**Contact / Consult:**

- Call poison control center (800) 222-1222
- Cardiology consult

**ONGOING MANAGEMENT**

**Follow up:**

- Continuous cardiac monitoring
- Serial ECGs

**Further treatment:**

- Treat hyperkalemia

**CAUTIONS**

- Complications:
  - In the event of cardiac arrest, skills of advanced cardiovascular life support (ACLS) is required
  - Correct electrolyte abnormalities (hyper/hypokalemia, hypomagnesemia)
- Caution:
  - Discontinue digoxin.

## REFERENCES & ACKNOWLEDGEMENTS

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