CASE DEFINITION

Digitalis

Clinical description

Signs and symptoms of acute digitalis (digoxin or digitoxin) poisoning by ingestion include primarily gastrointestinal effects (nausea and vomiting), hyperkalemia, and cardiovascular effects (bradydysrhythmias [heart rate <60 or atrioventricular block] or tachydysrhythmias [ventricular tachycardia/fibrillation or atrial tachycardia with 2:1 block]) (1-3).

Laboratory criteria for diagnosis

- *Biologic*: A case in which digitalis in serum samples is detected, as determined by a commercial laboratory.
    - Therapeutic levels of digoxin are 0.5-2.0 ng/mL; therapeutic levels of digitoxin are 10-30 ng/mL (4).
    - Because multiple determinants exist for digoxin poisoning and serum digoxin concentrations overlap between symptomatic and asymptomatic patients, use of the therapeutic range for diagnosis might be misleading. The therapeutic range should be correlated with the clinical findings.
    - Serum levels might be low after an exposure to plant glycosides, which cross-react imperfectly. In addition, false-positives might be noted for pregnant women and for patients with liver and renal disease (3).

-OR-

- *Environmental*: Detection of digitalis in environmental samples, as determined by FDA.

Case classification

- *Suspected*: A case in which a potentially exposed person is being evaluated by health-care workers or public health officials for poisoning by a particular chemical agent, but no specific credible threat exists.
- *Probable*: A clinically compatible case in which a high index of suspicion (credible threat or patient history regarding location and time) exists for digitalis exposure, or an epidemiologic link exists between this case and a laboratory-confirmed case.
- *Confirmed*: A clinically compatible case in which laboratory tests have confirmed exposure.

The case can be confirmed if laboratory testing was not performed because either a predominant amount of clinical and nonspecific laboratory evidence of a particular chemical was present or a 100% certainty of the etiology of the agent is known.

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Additional resources

1. Smith TW, Antman EM, Friedman PL, Blatt CM, Marsh JD. Digitalis glycosides: mechanisms and manifestations of toxicity [Part I]. Prog Cardiovasc Dis 1984;26:413-58.
2. Rosen MR, Wit AL, Hoffman BF. Electrophysiology and pharmacology of cardiac arrhythmias. IV. Cardiac antiarrhythmic and toxic effects of digitalis. Am Heart J 1975;89:391-9.
3. Hack JB, Lewin NA. Cardiac glycosides. In: Goldfrank LR, Flomenbaum NE, Lewin NA, Howland MA, Hoffman RS, Nelson LS, eds. Goldfrank's toxicologic emergencies. 7th ed. New York, NY: McGraw-Hill; 2002:724-40.
4. Benowitz NL. Cardiac glycosides. In: Olsen KR, Anderson IB, Benowitz NL, et al., eds. Poisoning and drug overdose. 4th ed. New York, NY: McGraw-Hill; 2004:155-7.

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