CONDITION

Digitalis toxicity

Digitalis toxicity is poisoning caused by excessive effects of digoxin or a related heart medicine.

WHAT IT IS
Poisoning from excessive effects of digoxin or related medicines

BODY SYSTEM
Heart and circulation, digestive system, brain, and vision

MAIN SYMPTOMS
Nausea, visual changes, confusion, irregular heartbeat

WHAT CAUSES IT
Overdose, reduced kidney clearance, or medicine interactions

HOW IT IS DIAGNOSED
Symptoms, ECG, digoxin level, electrolytes, and kidney tests

MAIN TREATMENT
Withholding digitalis, monitored supportive care, and antibody antidote

CAN IT BE CURED?
Yes - usually resolves after drug removal and treatment

IS IT AN EMERGENCY?
Sometimes - fainting, collapse, or dangerous heartbeat changes

LONG-TERM OUTLOOK
Usually good; severe heartbeat problems can be fatal

Overview

Digitalis toxicity means that digoxin, or a similar medicine, is having harmful effects on the body. Digoxin is sometimes used to manage heart failure or certain abnormal heart rhythms. Digitalis medicines originally came from the foxglove plant.

The difference between a helpful amount and a harmful amount can be small. Toxicity may happen after one large dose, called acute toxicity. It can also build up gradually during regular treatment, called chronic toxicity.

Digoxin mainly affects the heart, but toxicity can also disturb the stomach, brain, vision, and levels of minerals in the blood. Some symptoms are mild and nonspecific. Others come from dangerous changes in heart rhythm.

Digitalis toxicity is treatable. How serious it becomes depends on factors such as the amount involved, kidney function, blood potassium levels, the type of heart rhythm problem, and how quickly treatment begins.

Symptoms

Symptoms can begin within hours of a large overdose. When toxicity develops during regular treatment, the changes may be gradual and easy to mistake for another illness.

Digestive symptoms are common, especially:

Effects on the brain and nervous system may include unusual tiredness, weakness, dizziness, headache, confusion, agitation, or drowsiness. Older adults may mainly show reduced alertness, poor appetite, or a change in usual behaviour.

Vision may become blurred. Colours can look unusual, sometimes with yellow or green tints. You may notice halos around lights, although not everyone has visual symptoms.

Digitalis toxicity can make the heart beat too slowly, too quickly, or irregularly. This may feel like pounding, fluttering, skipped beats, light-headedness, breathlessness, or near-fainting. Some abnormal rhythms cause no obvious sensation and are found only on an electrocardiogram, or ECG.

Symptoms do not reliably show how high the digoxin level is. Serious rhythm changes can occur without severe stomach or visual symptoms.

- Loss of appetite
- Nausea or vomiting
- Diarrhoea
- Abdominal discomfort

Causes and risk factors

Digitalis toxicity can happen if too much medicine is taken at once. This may result from a dosing mistake, confusion between tablets, accidental ingestion by a child, or intentional overdose.

Chronic toxicity usually develops because digoxin builds up in the body. The kidneys remove most digoxin, so reduced kidney function is an important risk factor. A dose that was previously tolerated may become harmful after dehydration, a new kidney problem, or another

illness.

The risk can also rise with:

Some heart-rhythm medicines, blood-pressure medicines, antibiotics like amoxicillin or doxycycline , and other drugs can interact with digoxin. Water tablets like furosemide or hydrochlorothiazide , also called diuretics, may increase risk if they lower potassium or magnesium. An interaction does not always mean the medicines cannot be used together, but monitoring may be needed.

Eating foxglove or another plant containing cardiac glycosides can cause similar poisoning. Herbal or traditional remedies may also contain these substances or undeclared ingredients.

- Older age, frailty, or low body weight
- Low blood potassium or magnesium
- Certain heart conditions
- A recent change in digoxin dose or formulation
- Medicines that raise digoxin levels or increase its effects

Diagnosis

Diagnosis is based on the symptoms, medical history, examination, ECG findings, and blood tests. There is no single result that confirms every case.

An ECG records the heart's electrical activity. Digitalis toxicity can produce many different rhythm changes, so heart monitoring is often continued when significant toxicity is suspected.

A blood test can measure the digoxin concentration. The result must be interpreted alongside symptoms and other findings. A level taken too soon after a dose may appear high because the medicine has not yet spread fully into body tissues. Chronic toxicity can sometimes occur even when the reported level is within the laboratory's usual treatment range.

Blood tests also check potassium, magnesium, calcium, and kidney function. Potassium may be high after a large acute overdose. Low potassium can make the heart more sensitive to digoxin, particularly in chronic toxicity.

Tell the healthcare team when the last dose was taken, if known, and bring the medicine container or current medication list. After treatment with the antibody antidote, standard digoxin tests may remain misleading for a time because they can measure both active and antibody-bound medicine.

Treatment and management

Treatment depends on symptoms, ECG changes, blood results, kidney function, and whether exposure was acute or chronic. People with significant toxicity are usually monitored in hospital.

Digoxin is withheld while the situation is assessed. Other medicines that affect heart rhythm, kidney function, or mineral levels may also need review. Do not make lasting changes to prescribed heart medicines without a clinical plan.

Supportive care may include intravenous fluids, treatment for nausea, and careful correction of potassium or magnesium abnormalities. These minerals affect the heart, so correction is guided by blood tests and ECG monitoring rather than attempted at home.

Clinicians may use treatments for a dangerously slow or fast heart rhythm. The choice depends on the exact rhythm and the person's condition.

Digoxin immune Fab is a specific antidote made from antibody fragments. It binds digoxin so that the body can remove it. It is mainly used for severe or potentially life-threatening toxicity, such as dangerous heart rhythms, cardiac arrest, or marked potassium elevation after acute poisoning. It may also be considered when serious toxicity does not respond to supportive care.

Activated charcoal may sometimes be used soon after an ingestion, but only when a poison specialist or emergency team considers it appropriate. You should not try to cause vomiting.

Dialysis does not remove digoxin effectively because much of the medicine is attached to body tissues.

Complications

The main complications are abnormal heart rhythms. These can reduce blood flow to the brain and other organs, leading to fainting, shock, or cardiac arrest.

Severe vomiting or diarrhoea may cause dehydration and further disturb potassium or magnesium levels. This can worsen both kidney function and heart-rhythm problems.

Confusion or reduced alertness can increase the risk of falls and medication errors. Severe toxicity can be fatal, but prompt recognition, monitoring, and antidote treatment can greatly improve the chance of recovery.

Prevention

Many cases of digitalis toxicity can be prevented, although not every change in kidney function or medicine response can be predicted.

Take digoxin exactly as directed. Do not take an extra tablet to make up for a missed dose unless your prescriber has specifically told you to do so. A pill organiser, medication list, or reminder system may reduce double dosing.

Keep digoxin and all other medicines away from children. Do not handle foxglove or similar plants as food or medicine.

Make sure each clinician and pharmacist knows that you take digoxin. Check before starting a new prescription, over-the-counter medicine, or herbal product because interactions may raise digoxin levels or alter potassium.

Kidney function and blood minerals may need periodic testing. A digoxin level is useful in certain situations, such as possible toxicity, kidney changes, or medication interactions, but it is not the only measure of safety.

Vomiting, diarrhoea, poor fluid intake, or dehydration may change how your body handles digoxin. Seek advice promptly if these occur, especially if you also develop weakness, confusion, visual changes, or palpitations.

Living with it and what to expect

Acute symptoms often improve as digoxin is removed or neutralised, but monitoring may continue because rhythm changes can return. Recovery can take longer when kidney function is reduced because digoxin leaves the body more slowly.

After chronic toxicity, appetite, energy, thinking, and vision usually improve as the medicine level falls. The timing is not the same for everyone. Serious heart-rhythm problems may require a longer hospital stay.

Digitalis toxicity does not necessarily mean you can never take digoxin again. A clinician may decide to restart it later, adjust the treatment plan, or use another medicine. That decision considers why digoxin was prescribed, kidney function, other medicines, and the cause of the toxicity.

Treating toxicity does not cure the underlying heart failure or rhythm disorder. Those conditions still need follow-up. After discharge, medication review and any planned blood tests help reduce the chance of another episode.

When to get medical help

Call emergency services now if someone taking digoxin has:

A suspected ingestion by a child also needs immediate poison-centre or emergency advice, even if the child appears well. Do not wait for symptoms and do not induce vomiting.

Seek urgent same-day medical advice for new nausea, repeated vomiting, poor appetite, confusion, unusual weakness, colour-vision changes, or palpitations while taking digoxin. Also seek prompt advice if you may have taken extra doses or have become dehydrated.

Routine follow-up is appropriate when you feel well but need a planned medication review, kidney testing, or monitoring after a change in treatment.

- Collapsed, fainted, or cannot be awakened normally
- A seizure
- Severe trouble breathing
- A very slow, very fast, or markedly irregular heartbeat with weakness or dizziness
- Signs of shock, such as cold clammy skin and reduced responsiveness
- Taken a large or unknown amount of digoxin
- Swallowed digoxin intentionally

Common questions

Can digitalis toxicity happen at a "normal" digoxin level?

Yes. A blood level must be interpreted with your symptoms, ECG, kidney function, potassium level, and the timing of the test. Chronic toxicity can occur at a level that falls within a laboratory's usual treatment range.

How quickly does digitalis toxicity start?

Symptoms after a large overdose may begin within hours. Chronic toxicity can develop over days or weeks as digoxin accumulates, especially if kidney function declines or a new medicine causes an interaction.

What does digoxin toxicity do to your vision?

It may cause blurred vision, halos around lights, or changes in colour perception. Yellow or green tints are often described, but they are not present in every case and can have other causes.

Should I stop digoxin if I feel sick?

Do not take extra doses. If you develop possible toxicity symptoms, seek prompt medical advice so a clinician or poison service can tell you whether to hold the next dose. Fainting, collapse, severe weakness, or major heartbeat changes require emergency care.

Is there an antidote for digoxin poisoning?

Yes. Digoxin immune Fab binds digoxin and reduces its active effects. It is generally reserved for severe or potentially life-threatening toxicity rather than every mildly elevated blood level.

Can digitalis toxicity come back after treatment?

Symptoms can return if digoxin remains in body tissues, kidney clearance is poor, or the amount of antidote was not enough for the exposure. This is why ECG monitoring and repeat blood tests may continue after initial improvement.

Sources

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