CONDITION

Drug-induced liver injury

Drug-induced liver injury is liver damage caused by a medicine, non-prescription drug, or dietary supplement.

WHAT IT IS
Liver damage linked to a medicine or supplement

BODY SYSTEM
Liver and digestive system

MAIN SYMPTOMS
Tiredness, nausea, upper belly pain, jaundice

WHAT CAUSES IT
Toxic or unpredictable reactions to medicines and supplements

HOW IT IS DIAGNOSED
Liver tests, medication timeline, and exclusion of other causes

MAIN TREATMENT
Stopping the cause, monitoring, and supportive care

CAN IT BE CURED?
Sometimes - most recover after the trigger stops

IS IT AN EMERGENCY?
Sometimes - confusion, severe sleepiness, or unusual bleeding

LONG-TERM OUTLOOK
Most recover; severe or persistent injury can occur

Overview

Drug-induced liver injury, often shortened to DILI, is liver damage caused by a prescription medicine, non-prescription drug, herbal product, or dietary supplement. It can develop after taking a product correctly or after taking too much.

The liver processes many substances that enter the body. A medicine or one of its breakdown products can sometimes harm liver cells or the small tubes that carry bile, a digestive fluid made by the liver.

The injury may be found only through blood tests or may cause jaundice, which is yellowing of the skin or whites of the eyes. Rarely, it leads to acute liver failure, in which the liver rapidly loses its ability to work.

Most people improve after the responsible product is stopped, although recovery may take weeks or months. Some injuries are severe or long-lasting.

Symptoms

Drug-induced liver injury does not always cause symptoms. It may first appear as an abnormal routine liver blood test.

Symptoms may include:

Symptoms do not reliably show how much liver damage is present. Someone with important blood-test abnormalities may feel fairly well.

Confusion, unusual sleepiness, or abnormal bleeding can mean that liver function is seriously affected. These require emergency assessment.

- Tiredness, weakness, or reduced appetite
- Nausea, vomiting, or discomfort in the upper right abdomen
- Dark urine, pale stools, or itching
- Jaundice, meaning yellow skin or eyes
- Fever, rash, joint pain, or facial swelling in some immune reactions

Causes and risk factors

Many products can cause liver injury, including antibiotics like amoxicillin or doxycycline , anti-seizure medicines, pain relievers, cancer treatments, immune therapies, and tuberculosis medicines. Herbal remedies, bodybuilding products, weight-loss products, and other supplements can also be responsible. Serious liver injury is uncommon with most medicines.

A direct toxic reaction is predictable and related to the amount taken. Acetaminophen, also called paracetamol, is an important example. Taking too much can cause severe injury, including when several products containing acetaminophen are combined.

An idiosyncratic reaction is less predictable and may happen at a usual dose in someone who is unusually susceptible. Genes, immune responses, and how a person processes a medicine may contribute.

Risk varies by product. Age or sex may affect the risk from certain medicines. Existing liver disease does not make every medicine unsafe, although it may make serious injury harder to manage.

Symptoms may begin within days, weeks, or months of starting a product and can occasionally appear after it has been stopped. Taking a responsible medicine again may cause a faster, more severe reaction.

Diagnosis

There is no single test that confirms most cases. Diagnosis considers the pattern of liver abnormalities, when each product was started and stopped, and whether another condition could explain the findings.

Blood tests usually measure:

Albumin, a protein made by the liver, may also be checked.

You will usually be asked about every prescription medicine, non-prescription product, supplement, tea, powder, and recreational substance you use. Dates are important. Bring containers, label photographs, or an up-to-date list if possible.

Tests may look for viral hepatitis, autoimmune liver disease, gallstones, reduced blood flow, and other causes. An ultrasound or another scan can check the liver and bile ducts.

A liver biopsy removes a small tissue sample for examination. It is not needed for everyone and cannot identify the responsible medicine with certainty. It may help when the diagnosis remains unclear, results are not improving, or another liver condition is suspected.

- ALT and AST, which rise when liver cells are injured
- Alkaline phosphatase, which can rise when bile flow is affected
- Bilirubin, the yellow pigment associated with jaundice
- INR, which helps show whether the liver is making clotting proteins normally

Treatment and management

The main treatment is usually to stop the medicine or supplement thought to be responsible. This decision should be made promptly with a healthcare professional because stopping an essential medicine can also carry risks.

If an overdose is possible, especially involving acetaminophen, do not wait for symptoms. Emergency assessment is needed because early treatment matters. Hospitals can give N-acetylcysteine, an antidote that limits acetaminophen-related liver damage. It may also be used in selected cases of acute liver failure from other causes.

There is no general antidote for most forms of DILI. Treatment usually involves monitoring symptoms and repeating blood tests while the liver heals. Problems such as nausea, itching, or dehydration may be treated separately.

Corticosteroids like prednisone or hydrocortisone are not routine treatment for all DILI. They may be considered for specific immune-mediated reactions or autoimmune-like liver injury.

Severe injury may require hospital care. Acute liver failure is managed in a specialist centre, where liver transplantation may be considered if recovery is unlikely.

Do not restart a suspected product to test whether it causes the problem again. Re-exposure can cause more rapid or severe injury.

Complications

Most cases improve, but serious complications can occur.

Acute liver failure is a rapid loss of liver function. It can affect blood clotting and the brain, causing confusion or marked sleepiness. It is a medical emergency.

Cholestatic injury mainly affects bile flow. Jaundice and itching may last for weeks or months after the responsible product is stopped. Rarely, damage to the small bile ducts persists.

Liver tests may remain abnormal for months, known as chronic drug-induced liver injury. Some people develop lasting inflammation or scarring, called fibrosis. Advanced scarring is cirrhosis.

A severe reaction may also affect the skin, kidneys, blood cells, or other organs. Fever, widespread rash, facial swelling, or swollen glands alongside liver abnormalities can suggest a broader immune reaction.

Prevention

Drug-induced liver injury cannot always be prevented because unpredictable reactions may occur at recommended doses.

You can reduce avoidable risks by:

"Natural" does not mean harmless. Supplements may contain several active ingredients, and their contents may not match the label.

Do not stop a needed medicine solely because liver injury appears on its side-effect list. Your prescriber can explain the expected benefits, risks, and monitoring requirements.

- Checking whether more than one product contains acetaminophen or paracetamol

- Taking medicines only as directed and not sharing prescriptions
- Telling healthcare professionals about all supplements and herbal products
- Attending recommended blood tests for medicines that require liver monitoring
- Avoiding a product previously linked to your liver injury unless a specialist advises otherwise

Living with it and what to expect

After the suspected cause is stopped, liver tests may begin improving within days or weeks, but full recovery often takes longer. Injuries that interfere with bile flow tend to resolve more slowly.

Follow-up usually involves repeat blood tests until results clearly improve and return toward your usual levels. The timing depends on the injury's severity and pattern. Persistent abnormalities may require further testing or referral to a liver specialist.

During recovery, you may be advised to avoid alcohol and unnecessary supplements. Check before starting new medicines, including non-prescription pain relievers.

Keep a record of the responsible or suspected product, including generic and brand names if possible. It should be listed in your medical and pharmacy records. Closely related medicines may also need to be avoided.

Many people recover completely. Tiredness, itching, or poor appetite may continue while blood tests improve. A smaller number need longer-term follow-up. Symptoms alone cannot predict the course.

When to get medical help

Call emergency services or go to an emergency department if you have possible liver injury together with:

Seek urgent same-day medical advice for new yellowing of the eyes or skin, dark urine with pale stools, persistent vomiting, or significant pain in the upper right abdomen.

A widespread rash, fever, facial swelling, breathing difficulty, or mouth sores after starting a medicine also needs urgent assessment. These can indicate a serious whole-body drug reaction.

For mild symptoms or an unexpected abnormal liver test without emergency signs, promptly

contact the clinician who prescribed the medicine. Do not restart a stopped product or make major medication changes without advice unless emergency services tell you to do so.

- Confusion, unusual behaviour, or difficulty staying awake
- Vomiting blood, black stools, or heavy unexplained bleeding
- A suspected overdose, even if you currently feel well
- Rapidly worsening jaundice with severe weakness or repeated vomiting

Common questions

Is drug-induced liver injury reversible?

Often, yes. Many people recover after the responsible product is stopped. Recovery may be incomplete when the injury causes acute liver failure, persistent bile-duct damage, or advanced scarring.

How long does the liver take to recover?

Improvement may start within days or weeks, but liver tests can take weeks or months to return toward normal. Cholestatic injury often resolves more slowly. Follow-up blood tests are more useful than symptoms alone for tracking recovery.

Can it happen when I take a medicine correctly?

Yes. Some reactions are unpredictable and occur at recommended doses. Other injuries result from taking too much, combining products with the same ingredient, or interactions between substances.

Which medicine caused my liver injury?

The timing of each medicine and supplement provides important clues, but identifying one cause can be difficult. Blood tests, scans, and tests for other liver conditions help. A biopsy may support the assessment but usually cannot name the responsible product.

Can I drink alcohol while my liver recovers?

Alcohol may place added stress on an injured liver. You may be advised to avoid it until symptoms and liver tests have recovered. Ask your healthcare professional when it is safe to drink again.

Can I ever take the same medicine again?

Deliberate re-exposure is usually avoided because the reaction may return more quickly or be more severe. Rarely, a specialist may reconsider an essential medicine when no suitable alternative exists.

Sources

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