

Merck Manual Consumer Version

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Effects of Drugs on the Liver

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Many drugs can affect the way the liver functions, damage it, or do both.

Some drugs, such as statins (used to treat high cholesterol levels), can increase the levels of liver enzymes and cause liver damage (usually minor) but no symptoms.

A very few drugs damage the liver enough to cause symptoms, such as jaundice, abdominal pain, itching, and a tendency to bruise and bleed.

Doctors use the term drug-induced liver injury (DILI) to refer to any liver damage caused by drugs, whether it results in symptoms or not. The term also includes damage caused by medicinal herbs, plants, and nutritional supplements.

MEDICINAL HERBS AND THE LIVER

Some medicinal herbs (parts of plants used for health benefits) contain substances that can damage the liver. The liver is a prime target for damage because it processes everything that enters the mouth and is swallowed.

Pyrrolizidine alkaloids: Hundreds of herbs contain pyrrolizidine alkaloids, which may damage the liver. These herbs include borage, comfrey, and certain Chinese herbs, such as zi cao (groomwell), kuan dong hua (coltsfoot), qian li guang (liferoot), and pei lan (*Eupatorium*). Some herbs used to make teas contain pyrrolizidine alkaloids. Sometimes milk, honey, and cereals are contaminated with pyrrolizidine alkaloids, which are then consumed unknowingly.

Pyrrolizidine alkaloids can damage the liver gradually if small amounts are consumed for a long time. Damage can occur more quickly if a large amount is consumed. The hepatic veins may become clogged, blocking blood flow out of the liver.

Affected people have abdominal pain and may vomit. Fluid accumulates in the abdomen and legs. Eventually, scar tissue in the liver (cirrhosis), liver failure, and even death may result.

Other herbs : Liver damage may also result from herbs such as *Atractylis gummifera* , *Camellia sinensis* (used to make green and black teas), celandine (greater), chaparral, germander, jin bu huan, kava, ma huang (*Ephedra*), mistletoe, pennyroyal oil (used to make teas), and syo-saiko-to (a mixture of herbs).

For some drugs, liver damage is predictable. It occurs shortly after the drug is taken and is related to the drug's dose. In the United States, such damage (often caused by acetaminophen) is one of the most common causes of the sudden appearance of jaundice, liver failure, or both. For other drugs, damage is unpredictable. It is detected some time after the drug is taken and is not related to the dose. Rarely, such damage results in a severe liver disorder.

Risk factors

Generally, the risk of liver damage by drugs is thought to be increased by the following:

- Age 18 years or over
- Obesity
- Pregnancy
- Consumption of alcohol
- A genetic make-up that makes people more susceptible to a drug's effects

Drinking alcohol increases the risk of liver damage because alcohol damages the liver and thus changes the way drugs are metabolized. In addition, alcohol reduces the body's supply of an antioxidant that helps protect the liver.

Classification

Doctors categorize drug-induced liver damage in various ways, such as by how the drug damages the liver, how liver cells are affected, and which liver enzyme abnormalities are detected by blood tests. For example, drugs may damage the liver by directly damaging liver cells, by blocking the flow of bile out of the liver, or by doing both.

Drugs That Can Damage the Liver

Type of Drug	Examples
Antibiotics	Amoxicillin/clavulanate Clindamycin Erythromycin Nitrofurantoin Rifampin Sulfonamides Tetracyclines Trimethoprim/sulfamethoxazole Drugs used to treat tuberculosis (isoniazid and pyrazinamide)
Anticonvulsants	Carbamazepine Phenobarbital Phenytoin Valproate
Antidepressants	Bupropion Fluoxetine Mirtazapine Paroxetine Sertraline Trazodone Tricyclic antidepressants such as amitriptyline
Antifungal drugs	Ketoconazole Terbinafine
Antihypertensive drugs (used to treat high blood pressure or sometimes kidney or heart disorders)	Captopril Enalapril Irbesartan Lisinopril Losartan Verapamil

Antipsychotic drugs	Phenothiazines such as chlorpromazine Risperidone
Heart drugs	Amiodarone Clopidogrel
Hormones and related drugs	Anabolic steroids Birth control pills (oral contraceptives) Estrogens
Pain relievers	Acetaminophen NSAIDs
Other drugs	Acarbose (used to treat diabetes) Allopurinol (used to treat gout) ART drugs (used to treat HIV infection) Baclofen (a muscle relaxant) Cyproheptadine (an antihistamine) Azathioprine (used to prevent rejection of an organ transplant) Methotrexate (used to treat cancer) Omeprazole (used to treat gastroesophageal reflux) Statins (used to treat high cholesterol levels)
Medicinal herbs	Germander Green tea extract Kava
ART = antiretroviral therapy.	

Symptoms

Symptoms vary from general symptoms (such as fatigue, a general feeling of being unwell, nausea, itching, and loss of appetite) to more severe symptoms (such as jaundice, an enlarged liver, pain in the upper right part of the abdomen, confusion, disorientation, and reduced alertness—see [Overview of Liver Disease](#)).

Diagnosis

If liver damage caused by drugs is identified quickly, people have a better prognosis.

Doctors ask which drugs are being taken to determine whether any can cause liver damage. Doctors also do blood tests to measure levels of specific liver enzymes and to evaluate how well the liver is functioning and whether it is damaged (liver function tests). Drug-induced liver damage is likely when results of liver function tests are typical of the liver damage usually caused by a drug that the person is taking. Drugs sometimes cause damage after they are stopped, even when the dose was not high. Thus, determining that a drug is the cause is sometimes difficult or impossible.

Because no test can confirm the diagnosis, doctors also check for other causes of liver damage. Blood tests to check for hepatitis, autoimmune disorders, and other causes are done. Pressing on the upper abdomen to determine the size of the liver and doing imaging tests, such as ultrasonography or computed tomography (CT), can also help doctors identify other causes of liver damage.

After stopping the drug suspected of causing damage, doctors repeat liver function tests. A significant decrease liver enzyme levels further supports the diagnosis of drug-induced liver damage.

Prevention

When some drugs that can damage the liver (such as statins) are used, doctors sometimes regularly do blood tests to monitor liver enzyme levels. Such monitoring may detect problems early and may help prevent liver damage. For most drugs, monitoring liver enzyme levels does not help.

Treatment

Usually, stopping the drug results in recovery. Drugs to relieve symptoms such as itching can be used.

If the damage is severe, people may be referred to a specialist. Liver transplantation may be required.

Only a few drugs have antidotes. For example, acetylcysteine can be used if people have taken an overdose of acetaminophen.

