

Love Your Liver

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Introduction

Performing over 500 essential functions, the liver is the largest solid organ and the largest gland in the human body. This article will discuss the importance of the liver, the causes, signs and symptoms of improper liver function, as well as ways in which liver damage may be prevented.

Essential functions of the liver

As mentioned above, the liver performs over 500 vital functions in the human body. Some of these include:

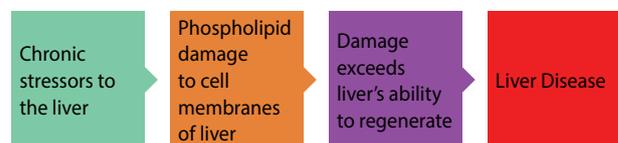
- The manufacture of essential body proteins.
- The metabolism of carbohydrates. The liver stores carbohydrates as glycogen, which is released into the blood stream whenever the body is in need of immediate energy.
- The removal of harmful substances from the blood and the detoxification of alcohol, certain drugs and environmental toxins and harmful metabolic waste.
- The production and secretion of bile, which helps in the digestion and absorption of fats and the fat-soluble vitamins (i.e. vitamins A, D, E and K). The gallbladder stores the bile produced by the liver and releases it into the intestines to assist with digestion when food is ingested.
- Regulation of cholesterol.
- Regulation of hormones.

Virtually everything that is ingested or applied to the skin is filtered through the liver. Many of the vital functions of the liver are dependent on the properties of the phospholipid membranes surrounding the cells in the liver. It is a highly resilient organ with the unique ability to regenerate (rebuild) itself should it be injured. In addition, the liver can still maintain its ability to function optimally during the regeneration process. For this reason, liver damage may go undetected, as there may be little or no initial symptoms of liver injury.

In order for the liver to regenerate optimally, it needs to be healthy. A damaged liver, or a liver that is not working optimally, can have serious repercussions and may be fatal.

Liver injury and disease

The liver is very susceptible to various injuries, as it is the first organ to receive substances from the gut. The following flow-diagram illustrates the progression of liver stressors and damage that can lead to liver disease:



Diseases affecting the liver include:

- **Acute or chronic hepatitis** (common name for an inflamed liver due to infection)
- **Cirrhosis** (permanent scarring of the liver)
- **Fatty liver**
- Liver cancer

These diseases may be caused by a range of factors, including genetics, viruses, **alcohol** use, **medications** and obesity.

Fatty liver

Alcohol

Liver damage as a result of alcohol is known as “alcohol-related liver disease” or ARLD.

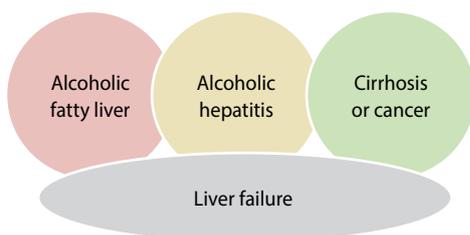
As the liver is responsible for filtering toxins from the blood, each time the liver filters alcohol, it leads to the destruction of liver cells. Although the liver has a unique ability to regenerate these liver cells, overuse or chronic use of alcohol lessens this ability resulting in serious liver damage.

Alcohol-related liver disease may progress in stages, which often overlap.

Initially, alcohol intake leads to an accumulation of fats in the liver, referred to as “alcoholic fatty liver disease.” Over time, continued alcohol misuse leads to persistent fatty liver and alcoholic hepatitis, which may become severe and life-threatening. Permanent and severe scarring of the liver (cirrhosis) occurs as a final stage of ARLD and is usually not reversible. Worldwide, alcohol is the most common cause of cirrhosis and liver cancer.

The diagram below illustrates this process.

Persistent fatty liver due to continued excess alcohol intake



Non-alcoholic fatty liver

Fatty liver disease can also occur in people who do not drink alcohol. This is known as *non-alcoholic fatty liver disease* (NAFLD). It is the most common form of chronic liver disease worldwide. This disease can progress to non-alcoholic hepatitis, cirrhosis and liver failure.

While the cause of NAFLD is not clearly established, certain conditions have been associated with the disease:

- Overweight or obesity
- Metabolic syndrome (increased abdominal fat, insulin resistance, high blood pressure, high triglyceride levels)
- Hyperglycaemia or Type 2 diabetes
- Polycystic ovary syndrome

Certain medications have also been associated with the development of NAFLD, which is discussed below.

Medications or drugs

The liver is vulnerable to any chemicals, taken orally or inhaled, whether intentionally or accidentally. There are many drugs that are potentially toxic to the liver.

Drug induced liver injury (DILI) describes clinically significant liver injury and may occur due to the use of prescription or over-the-counter (OTC) medications (including herbal medications and vitamins). DILI is one of the most common causes of acute liver failure.

Certain factors may increase a person’s risk of DILI, including:

- Age (18 years or older)
- Consuming alcohol concomitantly with medications

- Obesity
- Pregnancy
- Genetic

There are some medications which are predictable causes of DILI, and are dose-related, while other medications unexpectedly (unpredictably) cause DILI, which are not dose-related.

Paracetamol is a predictable cause of DILI and has been implicated in many hospitalisations. Accidental overdose of this freely available painkiller can be fatal in both children and adults. Other OTC medications, which are predictable causes of DILI, include nonsteroidal anti-inflammatory drugs, such as aspirin, ibuprofen and naproxen sodium.

Herbal, nutritional and plant supplements have also been known to cause toxic liver disease. Examples of such include (amongst many others) aloe vera, black cohosh, cascara, comfrey and kava.

Many prescription drugs, such as certain antibiotics (e.g. amoxicillin-clavulanate and erythromycin), methotrexate, antifungal medications, and allopurinol may result in DILI. Worldwide, the incidence of chronic liver disease is increasing due to extended use of antiviral drugs for HIV infection, chemotherapeutic medications and corticosteroids.

What are the symptoms of liver injury or disease?

Many patients with liver disease or injury have no symptoms at all. It is often only discovered incidentally as a result of a laboratory test.

Symptoms may appear only once liver damage has progressed.

Examples of these symptoms may include:

- Hepatomegaly (enlarged liver, usually detected during doctor examination)
- Nausea, vomiting and loss of appetite
- Weight loss
- Abdominal pain (usually in the upper right abdomen)
- Fatigue
- Jaundice (yellowing of skin and eyes)
- Dark urine
- Pale stools or may be dark stools (due to blood in stool)
- Pruritis (itching of skin)
- Abdominal and/or ankle swelling

Diagnostic tests used to detect liver injury or disease:

- Liver function test
- Urine analysis
- Doctors physical examination

Management and prevention of liver disease

As mentioned previously, symptoms of liver disease or damage may not present until permanent or irreversible damage has occurred.

In many cases, with correct management, liver damage may be reversed or further damage prevented.

Liver health is imperative to physical, emotional, mental well-being and energetic health.

Lifestyle modifications

Diet

- As obesity has been linked to fatty liver disease, eating a healthy, balanced diet rich in fruit, vegetables, whole grains and healthy fats. Increasing fitness levels through exercise can help maintain a healthy weight.
- All patients should be encouraged not to overeat and to rather eat small regular meals. Skipping meals should be discouraged. Sugar and saturated fat intake should be limited to prevent fat accumulation in the liver.
- Diabetic patients should be encouraged to maintain adequate control of their blood sugar levels.
- The liver consists of 96% water, the water is contained in the liver cells. This is why the liver requires lots of water to be consumed to rid the body of harmful waste.

Alcohol

- Alcohol should only be taken in moderation or completely eliminated from the diet.
- Women have a much lower alcohol tolerance threshold compared to men and are more susceptible to alcohol-related liver disease. Alcohol intake for women should be limited to one drink or less per day, and to two drinks or less per day for men.
- Alcohol and medications (prescription or OTC) should never be mixed.

Medications

Since patients with drug-induced liver injury are more likely to be asymptomatic, it is important to inform the patient of the following in order to prevent liver damage from occurring:

- Medications (prescription or OTC) should be taken only as prescribed and within recommended dosages and intervals.
- Medications should not be mixed with alcohol as this combination compounds the potential for developing liver damage. Paracetamol and alcohol, for example, can lead to acute liver failure.
- Paracetamol can also be found in many different OTC and prescription medications, which may be duplicated, thereby increasing the risk of accidental paracetamol overdose and acute liver failure.
- Certain medications (prescribed, OTC or herbal) can

interact with one another and increase the risk of liver damage.

- Patients should be made aware of the symptoms of liver injury and referred to the doctor as early as possible, as liver injury due to medication may be reversed if the offending medication is withdrawn.

Other

- The virus causing Hepatitis A is spread through the faecal-oral route, and causes an acute viral hepatitis. Hepatitis B is spread through body fluids, (sexual intercourse, blood, needles) and can lead to a chronic hepatitis B which often results in chronic liver damage.
- Hepatitis from viruses causing hepatitis A and hepatitis B may be prevented by vaccination.
- Patients should be encouraged to avoid risky behaviour which places them at increased risk of contracting these (and other) viruses, i.e.
 - Not to share needles used to inject drugs
 - To ensure sterility and cleanliness if getting a tattoo or body piercing
 - Use of condoms during sexual intercourse

Conclusion

The liver plays many essential roles in the body. Most people do not have symptoms of liver damage and may be unaware of possible liver disease. Awareness of the factors causing liver disease, and adopting possible preventative measures, is essential to the health of this vital organ.

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