



## Care for the Patronus of Human Health- the Silent Liver

**Baozhang Tang\***

*Department of Infectious Diseases, The First Affiliated Hospital of Kunming Medical College, Kunming, Yunnan Province, China*

\*Corresponding author: Tang B, Department of Infectious Diseases, The First Affiliated Hospital of Kunming Medical College, Kunming, Yunnan Province, China, E-Mail: yaleg.usmle@gmail.com

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### Abstract

The purpose of our study is to enhance our understanding of the liver as an important and mysterious organ of human body so that patients with liver diseases can take care of the Patronus of human health. This article creatively discusses the two main features of the liver, first the importance of the liver as the Patronus of human health; secondly, detailed characteristics of this silent organ. Then it further elaborates that we must properly make use of the liver. At the same time, as the liver is impaired in performing its functions, it must be emphasized that only good care of it can make the patient live longer and healthier. Patients with various liver diseases need to be regularly examined to get early and proper treatment.

**Keywords:** Liver care; Health care; Patronus

### Introduction

The liver is located in the right upper abdomen with an average weight of about 1.5 kilograms. This mysterious organ, the Patronus of human health, should be well cared for. Except the brain, the liver is the most functional organ, with important physiological functions such as digestion, metabolism, storage, blood storage, and detoxification. It is also directly engaged in the regulation of substance metabolism, immunity, defense, coagulation, and other mechanisms. The liver is one of the most important and irreplaceable organs, as well as the largest biochemical plant in human body with at least 600 enzymes (necessary for catalyzing various biochemical reactions), carrying out more than 500 biochemical reactions. The liver, carrying the burden of life, silently completes more than 5,000 important functions every minute to keep the body normally running.

The liver is the largest and most metabolically active organ in human body. It is involved in almost all metabolic processes in the body, including the metabolism of sugar, protein, fat, water, salt, vitamins, hormones, drugs, and other biologically active substances. For example, the synthesis of albumin, cholesterol, various enzymes, and many coagulation factors, and the inactivation of hormones, etc., is mainly carried out in the liver. It can be said that the liver is the center of material metabolism. Among various internal organs, the liver is the most metabolically important organ, and also the center of

energy metabolism, like a power plant producing a large amount of heat.

The liver is the largest digestive gland in the body. Hepatocytes can continuously produce bile acids and secrete bile, which can promote the digestion and absorption of fat in the small intestine. About 600-1100mL of bile is delivered to the gallbladder every day through the bile duct, and the gallbladder concentrates and stores the bile. When necessary, the gallbladder contracts and drains the bile into the duodenum.

### Background Study

The liver is an important purifier in the human body -- the main detoxification organ. Pathogenic microorganisms and harmful substances from the gastrointestinal tract and the body, such as bacteria, various toxins, poisons, foreign bodies, etc., can be removed and decomposed through the liver to purify blood non-toxic and harmless in the circulation. The main methods of detoxification include: chemical methods: such as oxidation, reduction, decomposition, binding and detoxification. Secretion: Toxic substances can be excreted with bile secretion. Phagocytosis: Macrophages in the liver phagocytose pathogenic microorganisms and various harmful substances.

The liver is also a large immune organ and an important part of body's immune system. It actively participates in the immune response and interacts with and regulates the immune response of the whole body. The liver can produce superoxide anion to kill bacteria and interferon to exert antiviral effect. The liver is also a main producer of immunoglobulin and complement (the two main components of humoral immunity), as well as the main place for processing antigens and antibodies, to maintain normal immune function and prevent damage to the body. At the same time, the liver is a silent organ. Numerous hepatocytes and immune cells are doing complicated work day and night, like fearless warriors fighting in the front line, to promptly clear all kinds of toxic and pathogenic microorganisms, with selfless dedication withstanding the damage silently.

The liver is the main site for the synthesis of various coagulation factors in human body. Four of all 12 kinds of blood coagulation factors are synthesized in the liver. In severe liver diseases, the synthesis of coagulation factors is reduced, leading to prolonged prothrombin time, decreased prothrombin activity, and bleeding tendency.

The liver is the only regenerative organ in human body, which has very rich blood flow (about 1/4 of the cardiac output) and a dual blood supply, provided by the portal vein and the hepatic artery. 70% to 80% of blood supply comes from the portal vein, rich in nutrients; another 20% to 30% from the hepatic artery, rich in oxygen. Therefore, the liver itself has a strong ability to regenerate and compensate. In the animal experiment, after 2/3resection of rat's liver, the liver regeneration was observed to restore the total amount of liver within 10-14 days, and terminated later. Experiments show that after cutting off 80% to 90% of dog's liver, a large number of hepatocytes can be regenerated from the remaining liver tissue, and the liver can be back to its original weight within 4 to 8 weeks. When the liver is damaged by trauma or disease, the compromised liver cells can eliminate the damaged tissue through self-defense and compensation mechanisms, and simultaneously regenerate new liver cells and other related cells to

restore the liver structure and functions. When the liver faces a surgical resection due to a disease, even after removing 30% to 40% of the liver, it usually returns to normal within 2 to 3 months. Localized injury of the liver usually does not cause liver dysfunction, because it has a strong compensatory function, and remaining of 20% of the normal liver tissue can generally maintain its normal functions. Therefore, many liver diseases can be found without obvious clinical manifestations in a relatively long course. We found a typical patient whose liver was capable of powerful compensatory function and regenerative capacity in clinic. The patient is male, who was admitted on August 25, 1984 and diagnosed as chronic severe hepatitis B (chronic hepatitis B liver failure) with active cirrhosis decompensating (refractory massive ascites). In the first 3 months, Western medicine was ineffective and it was turned to traditional Chinese medicine (reusing aconite and other medicine formulas) for the next 3 months. Finally, the patient was miraculously cured. HBV was also cleared without using antiviral drugs and anti-HBs (+) was also produced. The patient has been followed for 33 years, and he is now 83 years old.

In real life, the liver often has some problems to require attention. As fighting in the first line, the liver will be first damaged if overloaded or excessively detoxified more than normal functions, especially in the case of infection, using liver-damaging drugs, and poor lifestyles, such as excessive nutrition, alcoholism, etc. These factors can lead to various liver damage or liver diseases. Mild liver damage for a short time can be repaired by itself in most people, and thus it needs no specific treatment but supportive care.

Zhuang Hui pointed out that liver disease has been a serious public health problem in China for recent decades. It is estimated that there are about 400 million people with various liver diseases in our country. Among them, about 86 million cases of chronic HBV infection, accounting for 23.5%; about 10 million cases of chronic HCV infection, for 2.5%; about 60 million cases of alcoholic liver disease, for 15.0%; about 200 million cases of nonalcoholic fatty liver disease, for 50.0%; about 37 million cases of other liver diseases, for 9.3%.

**Fatty liver disease:** It is wrong for patients with different degrees of fatty liver to pay no attention to the long-term work of the disease liver generally. If patients with fatty liver do not change their lifestyle for a long time, such as proper exercise, and do not adjust the habit of high-fat diet structure, as well as no treatment, the condition will be aggravated. Recent studies abroad have shown that if getting worse, the fatty liver will be developed seriously and progressed to liver cancer. **Drug-induced liver disease:** Wang Jian introduced that in all adverse drug reactions worldwide, the incidence of drug-induced liver disease is 3% to 9%, and drug-induced liver failure accounts for 10% to 52% of acute liver failure, which is one of the important causes of fulminant hepatic failure. For example, data from the United States in 2007 showed that among the 1,600 patients with acute liver failure throughout the year, about 41% was caused by acetaminophen toxicity, ranking first by replacing viral hepatitis. According to incomplete statistics, about 100 kinds of Chinese herbal medicine and more than 30 kinds of proprietary Chinese medicine can cause liver damage. For example, Bo Li found in a study of 265 drug-induced liver diseases that the most common pathogenic drug was Chinese herbal medicine. It is often overlooked the use of liver-damaging drugs leading to drug-induced liver disease. At this time, once we monitored and detected liver damage, we need immediately to stop the liver-damaging drugs and give proper treatment. We should not rely on feelings to judge no obvious side effects and pay no attention.

**Alcoholic liver disease:** The drunkards are used to overwork of the liver for a long time. Alcoholics are blind to long-term damage of the liver. A drunkard loves wine and does not care for the health, tending to drink until the end of cirrhosis, vomiting blood, persistent ascites to give up (even some are not willing to give up). But at this time, regret has been too late and life was shortened. Therefore, those who are addicted to alcoholism should be resolutely abstained for their own health. Baoen Wang et al. reported in the 1960s, at least 310,000 people were estimated to die of cirrhosis every year throughout the world, mostly alcoholic cirrhosis. It is estimated that the incidence of alcoholic liver disease in China in the 1990s is about 30 times higher than that before the 1980s. In some provinces, the proportion of alcoholic liver disease in hospitalized patients with liver disease has increased year by year, from 2.4% in 2000 to 4.3% in 2004. In hepatic cirrhosis, the alcoholic cause was also increased from 10.8% in 1999 to 24.0% in 2003. In recent years, the incidence and mortality of alcoholic liver disease in China has shown a rapid upward trend. Advocates of wine culture believe that it is good for health to drink small or moderate amount of white wine and red wine, but it is difficult to measure the content of ethanol. Once this limit is surpassed, the liver will be damaged. People who are inclined in or addicted to wine culture usually drink alcohol for a long time and have different extent of alcoholic liver disease. Of course, at this time, the individual must stop drinking. If one continues, liver disease will be definitely worse, developing to alcoholic cirrhosis with very low 5-year survival rate and as high as 50% of mortality rate. **Viral hepatitis:** They are equally serious of liver disease and liver damage caused by Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) infection. Fortunately, due to the efforts of scientists, many effective antiviral drugs have been developed with good treatment effect. Therefore, patients with HBV, HCV infection must pay attention to their own health and should always do necessary examinations regularly. Then, according to the results of the examination, go to the regular hospitals and find a specialist to handle it correctly. Chronic HBV carriers do not need treatment with good health care. During chronic hepatitis B active period, patients need standardized treatment. Hepatitis C is now curable, and it is believed that the cure for chronic hepatitis B is not far away.

## METHODOLOGY and DATA

Pay attention to the care of the silent liver: Kangxian Luo pointed out the liver is a "silent" organ, and many progressive liver diseases can still be "asymptomatic." Chronic HBV carriers (ASC) and chronic hepatitis B often have no clinical manifestations. 20% of ASCs are developed to hepatitis at different stages of viral carryover. Chronic hepatitis B often shows "silence" and clinical manifestations are not often consistent with the severity of disease. There are about 93 million people with chronic HBV infection in China, including 20 million patients with chronic hepatitis B. Moreover, there are about 5.6 million people with HCV infection in the general population. If considering high-risk groups and high-incidence areas, there are about 10 million cases. In order to detect the changes of disease early, the three major groups (chronic hepatitis B patients, ASC and HCV-infected patients) need to be regularly checked for immediate treatment. Wai et al. reported that 387 cases of ASC examination found 5.4% of progressive comorbidities, including 13 cases of HBeAg-positive chronic hepatitis B, 2 cases of HBeAg-negative chronic hepatitis B, 3 cases of compensatory cirrhosis and 1 case of early-stage Hepato Cellular Carcinoma (HCC).

It can be positively stated that the liver is an important member of human body - a model worker willing to be silent and selfless. The human liver is repaired by itself after being injured. The liver is very strong, like a very cultured gentleman, who is very generous, silently enduring, not swearing when it is difficult, painful and sick. Unlike the heart, lungs and other organs, they will tell when uncomfortable, showing faster heart beating, short breath, heartache and the lack of oxygen, hard to bear. If you ignore it, it will protest loudly, express dissatisfaction, show great pain, send out alert, and ask doctor for help. If there is frequent arrhythmia and difficult breathing, the heart and lung will immediately send a cry to doctor. However, the liver does not squeak, because its ability to withstand pain and damage is very strong, if not exceeding the limit, it will not manifest. Even to early cirrhosis and small liver cancer, patients can go on without symptoms, and we can't ignore or neglect it. Therefore, the judgment of liver disease cannot be mistakenly considered asymptomatic as healthy based on patient's feelings. Since we know the importance of the liver in human body, as well as the above-mentioned features, we should take great care of it. Regular check-ups are needed, especially for those with HBV infection, to detect the disease timely and give correct treatment promptly. Early liver cirrhosis and a small-size liver tumor are mainly detected by imaging examinations such as B-ultrasound, CT and Magnetic Resonance (MR), rather than many blood tests.

For the healthy life of human beings, the liver not only works diligently, but also resists the attacks of various disease-causing enemies to firmly guard the health of human beings. The liver even has a self-sacrificing spirit. For the long-term massive drinking of alcoholics and the long-term use of liver-damaging drugs (such as acetaminophen-paracetamol, etc.) for anesthetic addicts, the liver will silently endure the destruction of health, and not scream even to the progress of end-stage liver disease and liver failure. We should be stressed to advice to such drinkers and narcotics addicts not to be so selfish to just care about your own pleasure and cruelly ignore the pain of the liver. They should sensibly quit these drugs as soon as they can. Otherwise, their liver will be in life risk. The liver cannot always work properly with illness while enduring long-term silent damage and

overload, even though it holds great potentials and compensation to withstand the damage. Although the liver has a strong regenerative capacity and compensatory function, under long-term overload, it is difficult to maintain its anatomic integrity and normal functions. If damaged for a long time, many liver cells are inflamed and necrotic until the disease progresses to leave only a few liver lobules and few remaining liver cells, leading to advanced cirrhosis, liver cancer, or liver failure.

We should not forget this important member - the liver because it is often silent and speechless, but the loyal Patronus of human health, the unsung hero who has always been hard-working and not pursuing fame. We should take good care of it in the long run. If we want the liver to protect and serve our health for a long time, we must act now, pay attention to the protection and care of the silent liver, and let the liver work normally. Moreover, we need to give it plenty of rest and supply nutrients it needs (of course, not over-nutrition to cause overweight, obesity, fatty liver, etc.) in order to complete the heavy task it bears. Especially for the sick liver, it is necessary to reduce the workload, working time, and intensity, and provide correct treatment with a good rest and recovery conditions so that patients with liver disease can live longer and healthier.

## **SUMMARY and CONCLUSIONS**

The liver is a complex scientific area. Liver disease is a monograph that deserves millions of words. Hematology, as a part of medical sciences, is much like the vast ocean that requires us so much work to explore. The liver is the Patronus of human health, working silently and selflessly. The various liver diseases from related database often show "silence", and it is a significant study defect left without adequate attention from us. We should take good care of it comprehensively and carefully in a long-term to get long quality of life.

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