

## ..... **What is Fibrosis/ Cirrhosis?** .....

*Alan Franciscus, Editor-in-Chief*

**H**epatitis C infection can lead to liver damage including fibrosis (light to medium scarring of the liver), cirrhosis (extensive scarring of the liver) and liver cancer. It is estimated that only 10-25% of people who have hepatitis C will develop cirrhosis, but this usually takes about 20-30 years. This fact sheet will discuss fibrosis and cirrhosis – the causes, disease progression and treatment.

### **The Liver**

The liver works to make us healthy by performing over 500 chemical functions. Almost everything that goes into the body is processed by the liver. This means that food, alcohol, medicines, fumes, chemicals or anything that you breathe, eat, drink or get on the skin have to be processed by the

liver to keep the body healthy. When large amounts of harmful substances are ingested, inhaled or get on the skin the liver is overwhelmed and it may be unable to reduce the amount of these substances in your body to safe levels. This can lead to the death of liver cells (hepatocytes).

### **How Do Fibrosis and Cirrhosis Develop?**

**LIVER FIBROSIS BEGINS WHEN THE LIVER BECOMES INFLAMED (IRRITATED AND SWOLLEN) DUE TO HEPATITIS B, HEPATITIS C, DRINKING ALCOHOL (ESPECIALLY DRINKING A LOT OF ALCOHOL OVER MANY YEARS), TOXINS SUCH AS CHEMICALS AND FUMES, AND OTHER FACTORS.**

Hepatitis C is one of the major causes of fibrosis and cirrhosis. When a virus enters the body it needs to find a cell to invade in order to multiply and survive. The hepatitis C virus can multiply in different types of cells in the body, but the main cell that it multiplies in is a liver cell. When the hepatitis C virus enters the

liver cell it uses the chemicals in the cell to multiply and make more copies of itself. Eventually the new viruses are released back into the bloodstream. During the process it kills the liver cell it has invaded. It is at this point that the body's immune system sends chemicals to the liver cells to try to repair the damage, but something goes wrong – the area around the liver cell becomes inflamed and irritated. Eventually, the area around the cell is surrounded by a type of tissue that may eventually form light scarring. As more and more liver cells are destroyed by the hepatitis C virus, the scarring starts to spread and it connects with other damaged and scarred cells.

After many years of infection the liver can be so damaged that it can not perform all of the functions to keep us healthy. The light to medium scarring of the liver is called fibrosis. The liver is also called a “non-complaining organ” so most people who develop fibrosis do not know that there is damage occurring.

After a period of time (usually many years) the fibrosis can become so severe that it spreads and connects to other liver tissue and forms extensive scarring. This is called cirrhosis. There are two types of cirrhosis – compensated and decompensated. **Compensated** cirrhosis means that the liver is heavily scarred but can still perform most of the functions that keep people healthy. **Decompensated** cirrhosis means that the liver is so scarred that blood can not flow through it which causes the liver function to break down. When it reaches this stage there are many conditions and symptoms that can occur.

## Tests

There are certain tests that may be performed by a doctor or nurse to tell how much the liver is damaged. Generally, a series of blood tests will be performed that will tell a doctor or nurse how the liver is functioning. Another test called a liver biopsy can tell the amount of liver damage hepatitis C has caused. The liver biopsy is performed by taking a tiny sample or piece of the liver, and a medical professional will examine it under a microscope to look for damage. A report is issued that will list how much (or how little) the liver is damaged.

## Progression

In general it takes many years before someone develops the severe type of fibrosis that leads to cirrhosis. The worsening of the fibrosis does not happen at the same rate for everybody. We do not know why some people develop more or less scarring of the liver. But we know that there are certain factors that can increase the chances that the liver will become more damaged.

We also know that fibrosis does not develop at the same rate over years. The rate of progression speeds up as damage occurs. For example it may take some people 10 years to form light scarring, but more severe scarring can occur within a shorter period of time.

*There are many factors that speed up the development of the scarring in people with hepatitis C including:*

- Drinking large amounts of alcohol over a long period of time
- People who are over 50 years old
- Men seem to progress at a faster rate than women
- Fat in liver cells or fatty liver (called steatosis)

- People who also have HIV (called HIV/HCV coinfection)
- People who have immune systems that are not functioning well
- People who have problems controlling their blood sugar levels, such as people with insulin resistance and diabetes

*Once the liver is heavily scarred many conditions and symptoms can develop including:*

- Severe blood pressure because blood can not pass through the liver. This is called *portal hypertension*
- Bleeding problems develop because the liver can not produce substances that help the blood clot. This is called *coagulopathy*
- Weakened blood vessels in the esophagus (tube from the mouth to the stomach), stomach and other areas of the digestive track because the blood is prevented from entering and leaving the liver due to severe scarring. This is called *varices*
- A build-up of fluid in the general area of the stomach because the liver can not make enough of a chemical that helps the cells to maintain the proper balance of fluids within the cell. This is called *ascites*

• The fluid from ascites can also become infected from bacteria that travel from the intestines. This is called *spontaneous bacterial peritonitis*

• People can also develop swelling of the hands, legs and feet. This is called *edema*

• Brain disease because the liver can not process the toxins in the body and these may eventually go to the brain. The liver also processes old red blood cells and in the process creates a chemical called ammonia. When the liver can not process and remove this chemical it can go to the brain. Symptoms of this condition are decreased intelligence, changes in the way people act, confusion and possibly coma. This is called *hepatic (liver) encephalopathy*

• Problems with male and female sex hormone is that the liver can not make some hormones or regulate other hormones. Men might develop breasts (called *gynecomastia*) and in women there can be *irregular periods* or menstrual cycles

• Itching all over the body because a substance called bile (produced by the liver to aid in digestion of fat) gets into the skin. This is called *pruritus*

• The kidneys may be damaged and unable to function. This is called *renal disease*

• The enlargement of an organ called the spleen that stores red and white blood cells as well as cells that help the blood clot (platelets). This is caused by blood backing up into the organ due to portal hypertension. This is called *splenomegaly*

Any of these symptoms can be controlled by drugs or medical procedures. Unfortunately, when people reach this stage (called end-stage liver disease) there is no treatment that can reverse these conditions and eventually a liver transplant will have to be performed.

However, if the fibrosis can be caught in time there are many steps that people can take to manage the fibrosis including:


- Stop drinking alcohol or greatly cut back on the amount of alcohol consumed
- Eat a healthy diet
- Light to moderate exercise

- Reduce stress
- Treatment with current hepatitis C medications.
- Have regular check-ups with your doctor.

## Fibrosis Treatment

- Scientists used to believe that if someone developed scarring of the liver that it could never be reversed or healed.
- However, in the last 5 years there has been some proof that when someone can get rid of hepatitis C from the blood the irritation, inflammation and even the light scarring can be improved and even stop any further damage from occurring. There are also studies of new drugs that may even be better at healing the liver, but the new drugs will probably not be available for many years. This is why it is important that if someone has a damaged liver they should be treated as soon as possible to reduce the risk of developing cirrhosis.

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