*1*

*The portal vein or hepatic portal vein (HPV) is a blood vessel that carries blood from the gastrointestinal tract, gallbladder, pancreas and spleen to the liver. This blood contains nutrients and toxins extracted from digested contents. Approximately 75% of total liver blood flow is through the portal vein, with the remainder coming from the hepatic artery proper. The blood leaves the liver to the heart in the hepatic veins.*

*2*

*I )Non-alcoholic fatty liver disease (NAFLD) is a very common disorder and refers to a group of conditions where there is accumulation of excess fat in the liver of people who drink little or no alcohol. The most common form of NAFLD is a non serious condition called fatty liver. In fatty liver, fat accumulates in the liver cells. Although having fat in the liver is not normal, by itself it probably does not damage the liver. A small group of people with NAFLD may have a more serious condition named non-alcoholic steatohepatitis (NASH). In NASH, fat accumulation is associated with liver cell inflammation and different degrees of scarring. NASH is a potentially serious condition that may lead to severe liver scarring and cirrhosis. Cirrhosis occurs when the liver sustains substantial damage, and the liver cells are gradually replaced by scar tissue (see figure), which results in the inability of the liver to work properly. Some patients who develop cirrhosis may eventually require a liver transplant (surgery to remove the damaged liver and replace it with a “new” liver).*

*Symptoms*

*The majority of individuals with NAFLD have no symptoms and a normal examination. Children may exhibit symptoms such as abdominal pain, which may be in the center or the right upper part of the abdomen, and sometimes fatigue. However, other causes of abdominal pain and fatigue should be considered. On physical examination the liver might be slightly enlarged and some children may have patchy, dark discoloration of the skin present (acanthosis nigricans) most commonly over the neck and the under arm area.*

*Causes of NAFLD/NASH*

*NAFLD is part of the metabolic syndrome characterized by diabetes, or pre-diabetes (insulin resistance), being overweight or obese, elevated blood lipids such as cholesterol and triglycerides, as well as high blood pressure. Not all patients have all the manifestations of the metabolic syndrome. Less is known about what causes NASH to develop. Researchers are focusing on several factors that may contribute to the development of NASH. These include:*

*Oxidative stress (imbalance between pro-oxidant and anti-oxidant chemicals that lead to liver cell damage)*

*Production and release of toxic inflammatory proteins (cytokines) by the patient’s own inflammatory cells, liver cells, or fat cells*

*Liver cell necrosis or death, called apoptosis*

*Adipose tissue (fat tissue) inflammation and infiltration by white blood cells*

*Gut microbiota (intestinal bacteria) which may play a role in liver inflammation*

*Risk Factors*

*NAFLD is a very common disorder affecting and may affect as many as one in three to one in five adults and around one in ten children in the United States. Obesity is thought to be the most common cause of fatty infiltration of the liver. The presence of type 2 diabetes and other conditions associated with insulin resistance, such as polycystic ovarian syndrome are know risk factors for the development of fatty liver and NASH.*

*Screening/Diagnosis*

*The diagnosis of NAFLD is usually first suspected in an overweight or obese person who is found to have mild elevations in their liver tests during a routine blood testing or incidentally detected on radiologic investigations such as abdominal ultrasound or CT scan. Some experts are now recommending that every obese child or adolescent should have these liver enzymes checked. However NAFLD can be present with normal liver blood tests. The diagnosis of NAFLD is confirmed by imaging studies, most commonly a liver ultrasound, showing accumulation of fat in the liver. Fat accumulation in the liver can also be caused by excess alcohol intake, certain medications, viral hepatitis, autoimmune liver disease, and metabolic or inherited liver disease. These need to be excluded as causes of fatty liver disease in order to confirm the diagnosis of NAFLD. Currently, the only reliable way of telling whether a person has NASH or simple fatty liver is by a liver biopsy. In this procedure, a small needle is inserted through the skin after local anesthesia is given to obtain a small piece of the liver for microscopic evaluation. NASH is diagnosed when examination of this piece of liver under the microscope shows fatty infiltration of the liver in addition to inflammation and different degrees of scarring. If only fat is present, then the diagnosis of simple fatty liver is made. The liver biopsy provides essential information regarding the degree of scarring within the liver, which would not be apparent on a blood test, ultrasound, or an x-ray alone. Liver biopsy rarely can be associated with serious risks including bleeding and patients should discuss the risks and benefits of the procedure with their physician.*

*Treatment of NAFLD/NASH*

*A few studies have suggested that weight loss may be associated with regression of fat within the liver. Therefore, the most important recommendations for people with fatty liver are to lose weight if they are overweight or obese, increase their physical activity, follow a balanced diet and avoid alcohol and unnecessary medications. New evidence suggests that Mediterranean diet (rich in monounsaturated fatty acids) may be more beneficial than low fat diet. Drinking coffee seems to decrease the risk of having fatty liver in large cohort studies. In patients with NASH, the more severe form of NAFLD, these same recommendations may be helpful. It is also important to control diabetes and treat elevated cholesterol levels when appropriate. Development of medications that could treat NAFD and NASH is an area of intense research. Recent trials in adult and children have shown that vitamin E (an anti-oxidant) could help improve NASH in non-diabetic patients. Strategies currently being evaluated by physicians and scientists to decrease the amount of fat/ inflammation in the liver include:*

*Weight reduction (diet + exercise, medications, surgery)*

*Lipid lowering medications*

*Insulin sensitizers (medications)*

*Decrease the amount of liver inflammation by administering anti-oxidant medications, anti-apoptotic medications and anti-cytokine medications*

*Ii. Hepatitis C is a viral infection that causes liver inflammation, sometimes leading to serious liver damage. The hepatitis C virus (HCV) spreads through contaminated blood.*

*Until recently, hepatitis C treatment required weekly injections and oral medications that many HCV-infected people couldn't take because of other health problems or unacceptable side effects.*

*Symptoms*

*Long-term infection with the hepatitis C virus is known as chronic hepatitis C. Chronic hepatitis C is usually a "silent" infection for many years, until the virus damages the liver enough to cause the signs and symptoms of liver disease.*

*Signs and symptoms include:*

*Bleeding easily*

*Bruising easily*

*Fatigue*

*Poor appetite*

*Yellow discoloration of the skin and eyes (jaundice)*

*Dark-colored urine*

*Itchy skin*

*Fluid buildup in your abdomen (ascites)*

*Swelling in your legs*

*Weight loss*

*Confusion, drowsiness and slurred speech (hepatic encephalopathy)*

*Spiderlike blood vessels on your skin (spider angiomas)*

*Every chronic hepatitis C infection starts with an acute phase. Acute hepatitis C usually goes undiagnosed because it rarely causes symptoms. When signs and symptoms are present, they may include jaundice, along with fatigue, nausea, fever and muscle aches. Acute symptoms appear one to three months after exposure to the virus and last two weeks to three months.*

*Acute hepatitis C infection doesn't always become chronic. Some people clear HCV from their bodies after the acute phase, an outcome known as spontaneous viral clearance. In studies of people diagnosed with acute HCV, rates of spontaneous viral clearance have varied from 15% to 25%. Acute hepatitis C also responds well to antiviral therapy.*

*CausesHepatitis C infection is caused by the hepatitis C virus (HCV). The infection spreads when blood contaminated with the virus enters the bloodstream of an uninfected person.*

*Globally, HCV exists in several distinct forms, known as genotypes. Seven distinct HCV genotypes and more than 67 subtypes have been identified. The most common HCV genotype in the United States is type 1.*

*Although chronic hepatitis C follows a similar course regardless of the genotype of the infecting virus, treatment recommendations vary depending on viral genotype.*

*Iii. Alcoholic hepatitis is a diseased, inflammatory condition of the liver caused by heavy alcohol consumption over an extended period of time. It’s also aggravated by binge drinking and ongoing alcohol use.*

*If you develop this condition, you must stop drinking alcohol. Continued drinking can lead to additional health problems, such as cirrhosis, excessive bleeding, or even liver failure.*

*What causes alcoholic hepatitis?*

*When alcohol gets processed in the liver, it produces highly toxic chemicals. These chemicals can injure the liver cells. This injury then leads to inflammation, and alcoholic hepatitis.*

*Although heavy alcohol use leads to alcoholic hepatitis, doctors aren’t entirely sure why the condition develops. Alcoholic hepatitis develops in a minority of people who heavily use alcohol —*

*Iv. Reye's (Reye) syndrome is a rare but serious condition that causes swelling in the liver and brain. Reye's syndrome most often affects children and teenagers recovering from a viral infection, most commonly the flu or chickenpox.*

*Signs and symptoms such as confusion, seizures and loss of consciousness require emergency treatment. Early diagnosis and treatment of Reye's syndrome can save a child's life.*

*Aspirin has been linked with Reye's syndrome, so use caution when giving aspirin to children or teenagers for fever or pain. Though aspirin is approved for use in children older than age 3, children and teenagers recovering from chickenpox or flu-like symptoms should never take aspirin.*

*For the treatment of fever or pain, consider giving your child infants' or children's over-the-counter fever and pain medications such as acetaminophen (Tylenol, others) or ibuprofen (Advil, Motrin, others) as a safer alternative to aspirin. Talk to your doctor if you have concerns.*

*In Reye's syndrome, a child's blood sugar level typically drops while the levels of ammonia and acidity in his or her blood rise. At the same time, the liver may swell and develop fatty deposits. Swelling may also occur in the brain, which can cause seizures, convulsions or loss of consciousness.*

*The signs and symptoms of Reye's syndrome typically appear about three to five days after the onset of a viral infection, such as the flu (influenza) or chickenpox, or an upper respiratory infection, such as a cold.*

*Initial signs and symptoms*

*For children younger than age 2, the first signs of Reye's syndrome may include:*

*Diarrhea*

*Rapid breathing*

*For older children and teenagers, early signs and symptoms may include:*

*Persistent or continuous vomiting*

*Unusual sleepiness or lethargy*

*Additional signs and symptoms*

*As the condition progresses, signs and symptoms may become more serious, including:*

*Irritable, aggressive or irrational behavior*

*Confusion, disorientation or hallucinations*

*Weakness or paralysis in the arms and legs*

*Seizures*

*Excessive lethargy*

*Decreased level of consciousness*

*These signs and symptoms require emergency treatment.*

*Causes*

*The exact cause of Reye's syndrome is unknown, although several factors may play a role in its development. Reye's syndrome seems to be triggered by using aspirin to treat a viral illness or infection — particularly flu (influenza) and chickenpox — in children and teenagers who have an underlying fatty acid oxidation disorder.*

*Fatty acid oxidation disorders are a group of inherited metabolic disorders in which the body is unable to break down fatty acids because an enzyme is missing or not working properly. A screening test is needed to determine if your child has a fatty acid oxidation disorder.*

*In some cases, Reye's syndrome may be an underlying metabolic condition that's unmasked by a viral illness. Exposure to certain toxins — such as insecticides, herbicides and paint thinner — also may contribute to Reye's syndrome.*

*Risk factors*

*The following factors — usually when they occur together — may increase your child's risk of developing Reye's syndrome:*

*Using aspirin to treat a viral infection, such as flu, chickenpox or an upper respiratory infection*

*Having an underlying fatty acid oxidation disorder*

*Complications*

*Most children and teenagers who have Reye's syndrome survive, although varying degrees of permanent brain damage are possible. Without proper diagnosis and treatment, Reye's syndrome can be fatal within a few days.*

*Prevention*

*Use caution when giving aspirin to children or teenagers. Though aspirin is approved for use in children older than age 3, children and teenagers recovering from chickenpox or flu-like symptoms should never take aspirin.*

*V. Wilson disease is an inherited disorder in which excessive amounts of copper accumulate in the body, particularly in the liver, brain, and eyes. The signs and symptoms of Wilson disease usually first appear between the ages of 6 and 45, but they most often begin during the teenage years. The features of this condition include a combination of liver disease and neurological and psychiatric problems.*

*Liver disease is typically the initial feature of Wilson disease in affected children and young adults; individuals diagnosed at an older age usually do not have symptoms of liver problems, although they may have very mild liver disease. The signs and symptoms of liver disease include yellowing of the skin or whites of the eyes (jaundice), fatigue, loss of appetite, and abdominal swelling.*

*Nervous system or psychiatric problems are often the initial features in individuals diagnosed in adulthood and commonly occur in young adults with Wilson disease. Signs and symptoms of these problems can include clumsiness, tremors, difficulty walking, speech problems, impaired thinking ability, depression, anxiety, and mood swings.*

*In many individuals with Wilson disease, copper deposits in the front surface of the eye (the cornea) form a green-to-brownish ring, called the Kayser-Fleischer ring, that surrounds the colored part of the eye. Abnormalities in eye movements, such as a restricted ability to gaze upwards, may also occur.*