



VIRAL HEPATITIS IN CHILDREN AND ITS TREATMENT

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Abstract : Hepatotrophic viruses causing hepatitis continue to be a major public health concern worldwide. Hepatitis due to Hepatitis A (HAV) and Hepatitis E (HEV) usually recover after acute infection. Hepatitis B (HBV), Hepatitis C (HCV) and Hepatitis D (HSV) may progress to chronicity with morbidity and mortality related to cirrhosis and a lifetime risk of hepatocellular carcinoma (HCC).

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INTRODUCTION

Viruses are a common cause of hepatitis in children. Hepatitis A and E cause acute infections while Hepatitis B, C and D can lead to chronic infection with increased morbidity and mortality due to chronic liver disease and hepatocellular carcinoma in later life. Acute infections may be fulminant causing acute liver failure necessitating a liver transplant. Our understanding of these viruses continues to evolve, and this review aims to summarize the current strategies in diagnosis, prevention and use of anti-viral drugs to treat these infections. Hepatitis is the inflammation of the liver that results from a variety of causes. Non-infectious causes include certain drugs and toxic agents. Sometimes, hepatitis results from an autoimmune reaction directed against the liver cells of the body. Hepatitis in children can be caused by many things. Your child can get hepatitis by being exposed to a virus that causes it. These viruses can include:

Hepatitis viruses. There are 5 main types of the hepatitis virus: A, B, C, D, and E.

Cytomegalovirus. This virus is a part of the herpes virus family.

Epstein-Barr virus. The virus causes mononucleosis.

Herpes simplex virus. Herpes can affect the face, the skin above the waist, or the genitals.

Varicella zoster virus (chickenpox). A complication of this virus is hepatitis. But this happens very rarely in children.



Enteroviruses. This is a group of viruses often seen in children. They include coxsackie viruses and echoviruses.

Rubella. This is a mild disease that causes a rash.

Adenovirus. This is a group of viruses that causes colds, tonsillitis, and ear infections in children. They can also cause diarrhea.

Parvovirus. This virus causes fifth disease. Symptoms include a slapped-cheek rash on the face.

Conditions can also cause hepatitis in children. These can include autoimmune liver disease. For this disease, your child's immune system makes antibodies that attack the liver. This causes inflammation that leads to hepatitis. Children who are exposed to a virus that causes hepatitis are more likely to get hepatitis.

Hepatitis A

This form of the virus is passed through fecal-oral contact. It's spread to children in the following ways:

Eating food made by an infected person who didn't wash their hands well after using the bathroom

Drinking water that is contaminated by infected feces. This is a problem in developing countries.

Touching an infected person's feces or dirty diaper, and then putting his or her hands near the mouth. Outbreaks may happen in child-care centers.

International travel to areas where hepatitis A is common

Using illegal drugs

Blood transfusions (very rare)

Hepatitis B

Hepatitis B is spread when blood from an infected person enters another person's body. It can be spread through needlesticks and sharp instruments. It can also be spread by sharing personal items such as razors and toothbrushes.

Babies may catch the virus during pregnancy if their mother has the virus. Children can spread it to others through household contact or through scrapes or cuts.

The following children are at risk for hepatitis B:

Children born to moms with hepatitis B.

Children born to mothers who have come from a country where hepatitis B is widespread. These include Southeast Asia and China.

Children who live in long-term care facilities or who are disabled.

Children who live in households where someone is infected with the virus.

Children who have a blood-clotting problem and need blood products. This can include hemophilia.

Children who need dialysis for kidney failure.

Teens who do high-risk activities. These include IV (intravenous) drug use and unprotected sex.

Hepatitis C

Hepatitis C passes through infected blood. It can also be passed through sexual contact. Moms can also pass it to their babies during pregnancy. The following children are at risk for hepatitis C:

Children born to mothers who have the virus.

Children who have a blood clotting problem, such as hemophilia.

Children who need dialysis for kidney failure.



Teens who do high-risk activities. These include IV (intravenous) drug use and unprotected sex.

Hepatitis D

This type of hepatitis can only happen with hepatitis B. Hepatitis D can happen at the same time your child is infected with hepatitis B, or it can start later.

Hepatitis D can't be spread from a mom to her baby during pregnancy. This condition is rare in children born in the U.S. This is because the hepatitis B vaccine is given to babies. Hepatitis D only happens in people already infected with hepatitis B.

Hepatitis E

This form of hepatitis is like hepatitis A. It's spread through fecal-oral contact. Hepatitis E is most common in developing countries. It's rare in the U.S.

Symptoms can happen a bit differently in each child. Some children don't have any symptoms. Symptoms of sudden (acute) hepatitis may include: flu-like symptoms, yellowing of the skin or the whites of the eyes (jaundice), fever, nausea or vomiting, loss of appetite, not feeling well, stomach pain or discomfort, diarrhea. The symptoms of this condition may look like symptoms of other health problems. Make sure your child sees his or her healthcare provider for a diagnosis. Your child's healthcare provider will check his or her health history. The provider will also give your child a physical exam. Your child may also need other tests.

Blood testing: your child's healthcare provider may do blood tests for the following:

Liver enzymes

Liver function

Antibody and polymerase chain reaction. This is to check for the type of hepatitis.

Cellular blood counts

Coagulation tests. These include international normalized ratio.

CT scan: a CT scan shows detailed images of any part of the body. This test will show your child's bones, muscles, fat, and organs. CT scans are more detailed than general X-rays.

Ultrasound - uses sound waves to examine parts of the body. It is very effective in examining the liver.

MRI: this test uses large magnets, radio waves, and a computer. Together, these show detailed images of organs and structures inside your child's body.

Liver biopsy: your child's healthcare provider may take out a tissue sample from your child's liver. Then he or she may look at it closely under a microscope.

Treatment will depend on your child's symptoms, age, and general health. It will also depend on how severe the condition is.

Your child's treatment will depend on what's causing his or her hepatitis. The goal of treatment is to stop damage to your child's liver. It's also to help ease symptoms. Your child's treatment may include:

Medicines. These can control itching, treat the virus, or control an autoimmune disease.

Supportive care. This includes eating a healthy diet and getting enough rest.

Reducing risk. Not using alcohol or illegal drugs.

Blood testing. This can tell if the disease is progressing.

Hospital stay. This is done in severe cases.

Liver transplant. This is done for end-stage liver failure.

Helping to prevent the spread of viral hepatitis. Having good personal health (hygiene) habits, such as handwashing. Treatment depends on the underlying cause of hepatitis. If your child has hepatitis from an infection, treatment generally is supportive: rest, staying well-hydrated and



supporting their immune system so it can recover from the virus. Talk with your pediatrician before giving your over-the-counter medicine for pain or fever because medicines like acetaminophen (Tylenol) may cause problems. . If hepatitis is caused by a medication, then talk to your pediatrician about stopping that medication. Rarely, if liver inflammation is severe, it can cause liver failure which may require a liver transplant. There are vaccines to protect children from two of the common virus types:

The hepatitis B vaccine (3-dose series) is given to infants at birth and twice again over the next several months. The Hepatitis B vaccine also protects against Hepatitis D, as you cannot develop hepatitis D unless a hepatitis B infection is present. ALL children and teens with chronic hepatitis B infection should be seen regularly by a pediatric liver specialist (or a provider knowledgeable about hepatitis B) whether they are on treatment or not. The standard recommendation is to schedule visits every six months, but it can be more or less depending on the situation. During these check-ups your child or teen will undergo a physical exam, blood tests, and possible imaging studies of the liver (such as an ultrasound, FibroScan [Transient Elastography] or CT scan).

There are currently 5 approved drugs in the United States for children living with hepatitis B .

Entecavir (Baraclude) is a pill that is taken once a day for at least one year or longer. It is considered a first-line treatment. Approved in 2014 for children 2 years and older.

Tenofovir disoproxil (Viread) is a pill that is taken once a day for at least one year or longer. It is considered a first-line treatment. Approved in 2012 for children 12 years and older.

Peginterferon alfa-2a (Pegasys) is an injection given once weekly for 6 months to 1 year and may include flu-like symptoms. It is considered a first-line treatment. Children must closely monitored by a liver specialist with regular visits and blood tests.

Interferon alpha (Intron A) is an injection usually given three times a week for 6 months to 1 year. Children generally experience fewer side effects than adults, but they can include flu-like symptoms. They must be closely monitored by a liver specialist with regular visits and blood tests. This is an older drug that is not usually prescribed.

Lamivudine (Epivir-HBV, Zeffix, Heptodin) is a pill that is taken once a day for at least one year or more. This is an older antiviral that results in drug resistance, thus, considered a second-line treatment.

Not every child with chronic hepatitis B needs to be treated. A pediatric liver specialist (or care provider knowledgeable about hepatitis B) should evaluate your child to decide whether he or she is a good candidate for treatment based on the results of a physical exam, blood tests, and imaging studies such as an ultrasound or CT scan. The approved drugs appear to be of greatest benefit to those who show signs of active liver disease.

The hepatitis A vaccine (2-dose series) is recommended for infants once they are 12 months old. The hepatitis A vaccine is especially important because there are areas of the country with high hepatitis A infection rates and for anyone traveling to areas where it spreads. There is no specific treatment for hepatitis A. Your child's body will clear up the infection on its own. In most cases, your child's liver will heal completely within a month or two, with no long-term damage. Hepatitis A treatment generally focuses on dealing with side-effects of the infection, including: rest more frequently. Many children with hepatitis A will have less energy as their bodies are fighting the infection. It may be more difficult to complete daily tasks. Encourage your child to rest when she needs to. Find ways to cope with nausea. Many children with hepatitis A feel queasy or may not be able to eat three large meals a day. Encourage your child to eat smaller portions more frequently through the day to get enough calories and maintain her energy level. Discuss medications and



supplements with your child's doctor. Your child's liver will have difficulty processing medications, over-the-counter drugs and supplements as her body is fighting the hepatitis A infection. Your child's doctor may recommend changing or stopping some medications until the injection is over.

All in all, The World Health Organization recently announced a goal of eliminating viral hepatitis as a major public health threat by 2030.19 Because PAs practice in nearly every clinical setting and specialty, they likely will encounter patients with liver disease due to viral hepatitis, and are appropriately positioned to drive change to achieve this goal. In addition to contributing to public awareness campaigns that support elimination efforts, PAs can promote safe and effective vaccinations that provide long-term protection against HAV and HBV, use screening tools to detect HCV earlier to mitigate patient risk for cirrhosis, and collaborate with specialists to initiate DAA therapy to achieve virologic cure in select patients with HCV.

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