

## the ABC's of Hepatitis

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### **Hepatitis Facts: Worldwide Snapshot**

#### Hepatitis A Virus (HAV) Infection:

- In 2005, there were an estimated 42,000 Hepatitis A infections.
- Hepatitis A is the cause of 30 days of missed work and approximately \$2,600 in lost wages each year.
- Medical care alone for hepatitis A can cost \$2,800 for each hospitalized case.
- Approximately 100 Americans die each year from Hepatitis A.
- The annual cost associated with Hepatitis A is estimated at \$200 million in the U.S.

#### Hepatitis B Virus (HBV) Infection:

- HBV is 100 times more infectious than HIV, the virus that can cause AIDS.
- Hepatitis B vaccine can provide immunity in over 95% of young healthy adults.
- An estimated 350 million people are infected globally with HBV.
- Approximately 1 million die each year from complications from HBV.
- 70% of new cases occur among people between the ages of 15-39.
- Every year 5,000 Americans die from cirrhosis and 1,000 from liver cancer due to HBV infections.
- 22,000 pregnant women in the U.S. are infected with HBV and can transmit it to their newborns.
- HBV can live on a dry surface for at least 7 days.

#### Hepatitis C Virus (HCV) Infection:

- 3% of the world's population is infected with HCV, or approximately 170 million people. 90% of HCV patients who are in need of treatment today cannot afford it.
- 80% of affected people can become chronically infected and risk serious long-term clinical disease including cirrhosis and liver cancer.
- 8 countries – Bolivia, Burundi, Cameroon, Egypt, Guinea, Mongolia, Rwanda, and Tanzania – have an HCV prevalence above 10%.
- 7 countries/areas – Gabon, Libya, Papua New Guinea, Suriname, Vietnam, Zaire, and the United Nations Relief and Works Agency for Palestine Refugees in the Near East – have an HCV prevalence between 5 and 10%.

- In developing countries, the primary sources of HCV infection include transfusion of blood or blood products from unscreened donors; transfusion of blood products that have not undergone viral inactivation; parenteral exposure to blood through the use of contaminated or adequately sterilized instruments and needles used in medical and dental procedures; the use of unsterilized objects for rituals (e.g. circumcision, scarification), traditional medicine (e.g. blood-letting) or other activities that break the skin (e.g. tattooing, ear or body-piercing); and intravenous drug use. Household or sexual contacts of HCV-infected persons are marginally at risk.
- In developed countries, persons at risk of HCV infection include recipients of previously unscreened blood, blood products, and organs; intravenous drug users; individuals undergoing chronic hemodialysis; health care workers with percutaneous exposure from contaminated needles or sharps; persons who participate in high-risk sexual practices; and persons undergoing medical or dental procedures with inadequately sterilized instruments. Sexual and household transmission are uncommon.

## **Basics: Hepatitis A (HAV)**

### **What is Hepatitis A ?**

Hepatitis A is one of many hepatitis viruses causing inflammation of the liver.

### **Who Is At Risk?**

Hepatitis A can affect anyone. In the U. S., hepatitis A can occur in situations ranging from isolated cases of disease to widespread epidemics. Hepatitis A is one of the most frequently reported vaccine-preventable diseases in the U. S. Some of the higher-risk groups are: travelers to countries with high rates of hepatitis A, men who have sex with men, injecting-drug users, people with clotting-factor disorders, people with chronic liver disease, and children living in communities with high rates of disease.

### **Symptoms**

Children with hepatitis A usually have no symptoms. Adults may become quite ill suddenly, experiencing jaundice, fatigue, nausea, vomiting, abdominal pain, dark urine/light stools, and fever. The incubation period averages 30 days. However, an infected individual can transmit the virus to others as early as two weeks before symptoms appear. Symptoms will disappear over a 6 -12-month period until complete recovery occurs.

### **Diagnosis**

Your doctor can't single out Hepatitis A from other types of viral hepatitis based upon your physical symptoms alone. The only way to diagnose HAV is to do a blood test seeking to find IgM antibodies. In most people, these antibodies become detectable 5-10 days before the onset of symptoms and can persist for up to 6 months after infection.

### ***How Does it Spread?***

Hepatitis A is most often spread from person to person through situations such as these:

- Food preparers who are infected can pass the virus on if they do not wash their hands with soap and water after having a bowel movement, especially when they prepare uncooked foods.

- Fecal contamination of food and water.
- Anal/oral contact, by putting something in the mouth that had been contaminated with infected feces.
- Diaper changing tables, if not cleaned properly or changed after each use, may facilitate the spread of HAV.
- Fecal residue may remain on the hands of people changing soiled diapers.
- Eating raw or partially cooked shellfish contaminated with HAV.

### **Treatment**

No specific treatment is necessary for hepatitis A. Disease

### **Outcome**

Hepatitis A will clear up on its own in a few weeks or months with no serious after effects. Once recovered, an individual is then immune for life to HAV through the presence of the IgG antibody. About 1 in 100 HAV sufferers may experience a sudden and severe (i.e., "fulminant") infection.

### **Preventing HAV**

Infection HAV infection is preventable! Here's how you do it:

- Get an immune globulin (IG) shot. An IG shot can provide temporary immunity to the virus for 2 to 3 months when given prior to exposure to HAV or within 2 weeks after exposure.
- Ask for the HAV vaccine. The HAV vaccine, made from inactive hepatitis A virus (synthetic), is highly effective in preventing the hepatitis A infection. However, its safety when given during pregnancy has not been determined. Check with your doctor to determine how many shots you need. The vaccine provides protection for about four weeks after the first injection; a second injection protects you longer, possibly up to 20 years.

### **Who should have the HAV vaccine?**

- Users of illegal drugs.
- Individuals who have chronic liver disease or blood clotting disorders (e.g., hemophilia).
- Those who have close physical contact with people who live in areas with poor sanitary conditions.
- Those who travel or work in developing countries. This includes all countries except northern and western Europe, Japan, Australia, New Zealand, and North America except Mexico.
- Men who have sex with other men.
- Children in populations that have repeated epidemics of hepatitis A (e.g., Alaska natives, American Indians, and certain closed religious communities).
- People who have chronic liver disease.

### **Basics: Hepatitis B (HBV)**

#### *What is Hepatitis B?*

Hepatitis B is an inflammatory liver disease caused by the hepatitis B virus (HBV) that results in liver cell damage. This damage can lead to scarring of the liver (cirrhosis) and increased risk of liver cancer in some people. About 80,000

Americans were newly infected with HBV in 1999.

### *Who Is At Risk?*

One out of every 20 people in the U. S. will become infected with HBV sometime during their lives. Your risk is higher if you:

- Have sex with someone infected with HBV.
- Have sex with more than one partner.
- Are a man and have sex with a man.
- Live in the same house with someone who has chronic HBV infection.
- Have a job that involves contact with human blood.
- Inject illegal substances/drugs. Have hemophilia.
- Travel to areas where HBV is common (this includes all countries except northern and western Europe, Japan, Australia, New Zealand, and North America except Mexico).

### **Symptoms**

Many people with newly acquired hepatitis B have no symptoms at all, or they may be very mild and flu-like – loss of appetite, nausea, fatigue, muscle or joint aches, mild fever, and possibly jaundice (yellowish tinge to the skin). The only way to know if you are currently infected with HBV – or if you still carry the virus – is to ask your doctor to do a specific blood test for hepatitis B (it may not be included in a routine blood test). The test may not show positive during the incubation period (45-180 days).

### **Diagnosis**

There are three standard blood tests for HBV:

- HBsAG (hepatitis B surface antigen):  
When this test is positive or reactive, you are infected with HBV and can pass it on to others.
- Anti-HBc (antibody to hepatitis B core antigen):  
When you test positive, it means you are currently infected with HBV or have been infected at some point in the past.
- Anti-HBs (antibody to HbsAg):  
When this test is positive, it means that you are immune to hepatitis B either as a result of having had the disease or from having been given the vaccine.

### **How Does It Spread?**

HBV is found in blood, seminal fluid, and vaginal secretions. The risk of transmission is increased in these situations:

- Sexual contact with an infected person.
- Living in the same household with an infected individual.
- Contact with infected blood or seminal fluid and contaminated needles, including tattoo/body piercing instruments.
- HBV-infected mother to her newborn at time of delivery (prenatal blood tests for HBV should always be done if there is a suspicion of HBV).

### **Treating HBV**

There are two medications to treat chronic HBV – Interferon (IFN) and Lamivudine. Less than 50% of patients with chronic HBV are candidates for interferon therapy.

Initially, 40% of HBV patients who are treated with IFN will respond. However, some will relapse when the treatment is stopped. Overall, about 35% of the eligible patients will benefit. IFN treatments may have a number of side effects, including flu-like symptoms, headache, nausea, vomiting, loss of appetite, depression, diarrhea, fatigue, and thinning hair. Interferon may lower the production of white blood cells and platelets by depressing the bone marrow. Thus, blood tests are needed to monitor blood cells, platelets, and liver enzymes. The response to oral Lamivudine, given for at least one year, may be somewhat lower. In addition, those who are chronically infected with HBV should be vaccinated against hepatitis A. There is no treatment for acute Hepatitis B.

#### *Disease Outcome*

- Either you develop immunity to HBV . . . 95% of adults infected develop antibodies and recover spontaneously within six months. Upon recovery, they develop immunity to the virus and they are not infectious to others. Blood tests will always test positive for the HBV antibody. Blood banks will not accept donations of blood from HBV-immune people.
- OR you become chronically infected. About 5% of the time, the virus does not clear the body within six months. If so, a person is considered a carrier – or chronically infected. Chronically infected people may or may not show outward signs or symptoms. The HBV virus remains in blood and body fluids, and can infect others.

#### **Preventing HBV Infection - Things you can do:**

- Practice safe sex (use latex condoms).
- Don't share anything that could have an infected person's blood on it, i.e. toothbrushes, razors, nail clippers, body piercing instruments.
- Don't share drug needles, cocaine straws or any drug paraphernalia.
- Cover all sores and rashes and do not touch them.
- Clean up any blood spills with a 10% solution of household bleach. Infected persons should not pre-chew food for babies.
- If exposed to hepatitis B, get an HBIG (hepatitis B immune globulin) injection within 14 days following exposure.

#### **Get an HBV vaccination.**

Here's who should be vaccinated without fail:

- All individuals living in the same household with a chronically infected individual.
- All newborns and children up to the age of 19.
- Those who are in positions where they are exposed to blood at work, through drug use, or who have multiple sex partners.
- Individuals with hepatitis C and other chronic liver diseases.

Vaccination provides protection for more than 15 years, and possibly a lifetime. HBV booster shots are not recommended.

#### **Newborn Vaccination**

All newborns should get three vaccination doses of the HBV vaccine the first within 12 hours of birth, the second at 1-2 months, and the third at 6 months. In addition, babies born to infected mothers should receive a shot called H-BIG within 12 hours of delivery. Without the above intervention, 90% of babies born to infected mothers

will become chronically infected, reducing their life expectancies. A few months after the last dose is given, the doctor will test to see if the baby is making HBV antibodies. If so, the baby will be safe from hepatitis B for life. HBV-infected mothers may nurse their babies.

## **Basics: Hepatitis C (HCV)**

### **What Is Hepatitis C ?**

Hepatitis C virus (HCV) causes inflammation of the liver. A national U. S. survey found that 1.8 percent of Americans – about 3.9 million – have been infected with HCV, of whom most about 2.7 million – are chronically infected with HCV, with many showing no signs or symptoms. The good news is that, in 1995, a reliable antibody test for HCV was finally implemented nationwide. About 41,000 new cases occurred in 1998 with 15-25% recovering spontaneously. Hepatitis C is a slow-progressing disease that may take 10-40 years to cause serious liver damage in some people.

### **Who Is At Risk?**

Since about four million Americans are infected with HCV and most don't know it, you should have a blood test for hepatitis C whether you feel sick or not. About one in ten people infected with HCV have had no identifiable exposure to HCV. That said, here are several obvious risk factors:

- Intravenous (IV) drug users – even IV use in the distant past.
- Those with multiple sex partners or sex with partners who have other sexually transmitted diseases.
- Those with tattoos or body piercing done with unsterile instruments. Anyone who has had a blood transfusion prior to 1992 or clotting factors produced before 1987.
- Hemodialysis (diabetes) patients.
- The potential for transmission from an HCV-infected mother to her newborn appears to be about 5%.

### **How Does it Spread?**

- Injection drug use is the primary risk for HCV infection. Injection drug use accounts for about 60% of all new cases of hepatitis C and is a major risk factor for infection with hepatitis B virus. Among frequent drug users, 50-80% are infected by HCV within the first 12 months of beginning injecting.
- Straws shared in snorting drugs are also a potential source of infection of HCV. The hepatitis C virus is found mainly in blood.
- HCV is not spread through kissing or casual contact.
- In relationships where there is one steady partner, sexual transmission is exceedingly unusual, less than 3% over decades in sexually active couples. Transmission from HCV RNA negative individuals has never been reported. Sexual transmission may be more common among those with multiple sex partners or where there is a history of sexually transmitted disease but this remains controversial and unconfirmed.
- HCV may be transmitted by using razors, needles, toothbrushes, nail files, a barber's scissors, tattooing equipment, body piercing or acupuncture needles if these items are contaminated by blood of an infected person.
- Healthcare workers have a 2% risk of acquiring HCV after a needle stick

- contaminated with HCV-positive blood.
- There is no evidence indicating that HCV is transmitted through breast milk.
- The current transmission rate through blood transfusions is estimated at less than 1 per 1,000,000 units transfused.

### **Symptoms**

Most people who are infected with the HCV do not have symptoms and are leading normal lives. If symptoms are present, they may be very mild and flu-like – nausea, fatigue, loss of appetite, fever, headaches, and abdominal pain. Most people do not have jaundice although jaundice can sometimes occur along with dark urine.

The incubation period varies from 2-26 weeks. Liver enzyme tests may range from being elevated to being normal for weeks to as long as a year. The virus is in the blood and may be causing liver cell damage, and the infected person can transmit the disease to others.

### **Diagnosis**

Test for HCV antibodies: HCV infection can be determined by a simple and specific blood test that detects antibodies against HCV. The current enzyme immunoassay test (EIA) that detects anti-HCV has a sensitivity of about 95% in chronic HCV. HCV infection may be identified by anti-HCV testing in approximately 80% of people as early as five weeks after exposure. This test is not a part of a routine physical examination, and people must ask their doctor for a hepatitis C antibody test. (Note: The antibody itself does not provide immunity, and the test does not distinguish between acute or chronic infection.) If the initial test is positive, it test should be repeated to confirm the diagnosis (and exclude possible laboratory error). If the initial test is negative, but the infection could have occurred within the last six months and HCV is suspected, antibody levels may not be high enough yet to be detectable (antibodies may not be present in the first 4 weeks of infection in about 30% of patients) or you may lack immune response. Under these circumstances, ask you doctor about repeating the test and about alternative test methods.

Test liver enzyme levels: If you may already have chronic infection, your doctor will test the levels of two liver enzymes. These are alanine aminotransferase (ALT) and aspartate aminotransferase (AST). Both are released when liver cells are injured or die. Elevated ALT and AST levels may appear and disappear throughout the course of the HCV infection. If the liver enzyme levels are normal with chronic HCV, they should be re-checked several times over a 6 - 12 month period. If the liver enzyme levels remain normal, your doctor may check them less frequently, such as once a year.

### **Treating HCV**

- There are three types of interferon, plus a combination of interferon and Ribavirin, used to treat hepatitis C. Blood tests and liver biopsy findings may determine the need for treatment.
- Interferon must be given by injection, and may have a number of side effects, including flu-like symptoms – headaches, fever, fatigue, loss of appetite, nausea, vomiting, and thinning of hair.
- Ribavirin, given by mouth, can have additional side effects including depression, severe anemia and especially birth defects. Women or the male partners of women, who are pregnant or who are planning pregnancy, should not take Ribavirin. Pregnancy should not be attempted until six months after

- treatment is ended. Ribavirin may also interfere with the production of red blood cells and platelets by depressing bone marrow. Patients should be monitored frequently.
- While 50-60% of patients respond to treatment initially, sustained response occurs in up to 40%.
  - Treatment of children with HCV is under investigation.
  - Researchers are re-examining when treatment should begin, for how long it should continue, and its effectiveness.
  - Many pharmaceutical companies and NIH are conducting research to find more effective treatments and cures.
  - Currently, almost 1/2 of all liver transplants in the US are performed for end-stage hepatitis C. However, re-infection of the transplanted liver by the virus usually occurs and may require a second transplant.
  - Try to maintain as normal a life as possible, eating a well-balanced diet, exercising and keeping a positive attitude. Avoid depressing or overwhelming tasks and learn how to pace yourself. Rest when you feel tired. Plan physically exhausting tasks in the morning when your energy level is at its peak.

### **Disease Outcomes**

Between 20- 30 percent of HCV sufferers are able to have a sustained viral response with proper treatment. Between 70 80% of the HVC infections reported each year become classified as chronic. Chronic HCV refers to infections that do not clear up within 6 months after the acute infection. Within the chronically infected group, about 20% go on to develop cirrhosis (scarring of the liver). Of this group, 25% may develop liver failure, even though this may take 30-40 years. Cirrhosis slows the blood flow through the liver and causes increased pressure in the vein that carries blood from the stomach and the intestines to the liver. As a result, varicose veins (e.g., "varices") may develop in the stomach and esophagus. Without warning these large veins can break causing a person to vomit blood or have black, tarry stools. An estimated 8,000-10,000 deaths occur each year resulting from the complications of HCV.

### **Preventing HCV Infection**

- There is NO vaccine to prevent HCV. Vaccines for Hepatitis A and B do not provide immunity against hepatitis C. There are various genotypes of HCV and the virus undergoes mutations making it difficult to develop a vaccine.
- Avoid handling anything that may have the blood of an infected person on it, such as razors, scissors, toothbrushes, nail clippers or files, tampons or sanitary napkins, etc. Detergent and a 10% solution of household bleach is believed to kill the virus.
- Don' t share drug needles, cocaine straws or any drug paraphernalia.
- Practice safe sex (use latex condoms).
- Notify your physician and dentist that you have hepatitis .
- Get vaccinated against hepatitis A and B.
- Those infected with hepatitis C should not drink alcohol, as it accelerates the liver damage.