WORLD HEALTH ORGANIZATION

HEPATITIS B

Hepatitis B is one of the major diseases of mankind and is a serious global public health problem. It is preventable with safe and effective vaccines that have been available since 1982. Of the 2 billion people who have been infected with the hepatitis B virus (HBV), more than 350 million have chronic (lifelong) infections. These chronically infected persons are at high risk of death from cirrhosis of the liver and liver cancer, diseases that kill about one million persons each year. Although the vaccine will not cure chronic hepatitis, it is 95% effective in preventing chronic infections from developing, and is the first vaccine against a major human cancer. In 1991, the World Health Organization (WHO) called for all children to receive the hepatitis B vaccine, and 116 countries have added this vaccine to their routine immunization programmes. However, the children in the poorest countries, who need the vaccine the most, have not been receiving it because their governments cannot afford it. Fortunately, hepatitis B vaccine will soon be available in these countries with the assistance of the Global Alliance for Vaccines and Immunization (GAVI) and the Global Fund for Children's Vaccines.

What is Hepatitis?

Hepatitis means inflammation of the liver, and the most common cause is infection with one of 5 viruses, called hepatitis A,B,C,D, and E. All of these viruses can cause an acute disease with symptoms lasting several weeks including yellowing of the skin and eyes (jaundice); dark urine; extreme fatigue; nausea; vomiting and abdominal pain. It can take several months to a year to feel fit again. Hepatitis B virus can cause chronic infection in which the patient never gets rid of the virus and many years later develops cirrhosis of the liver or liver cancer. HBV is the most serious type of viral hepatitis and the only type causing chronic hepatitis for which a vaccine is available.

Who gets Hepatitis B ?

In much of the developing world, (sub-Saharan Africa, most of Asia, and the Pacific), most people become infected with HBV during childhood, and 8% to 10% of people in the general population become chronically infected. In these regions liver cancer caused by HBV figures among the first three causes death by cancer in men.

High rates of chronic HBV infection are also found in the Amazon and the southern parts of Eastern and Central Europe. In the Middle East and Indian sub-continent, about 5% are chronically infected. Infection is less common in Western Europe and North America, where less than 1% are chronically infected.

Young children who become infected with HBV are the most likely to develop chronic infection. About 90% of infants infected during the first year of life and 30% to 50% of children infected between 1 to 4 years of age develop chronic infection. The risk of death from HBV-related liver cancer or cirrhosis is approximately 25% for persons who become chronically infected during childhood.

How do people get infected ?

Hepatitis B virus is transmitted by contact with blood or body fluids of an infected person in the same way as human immunodeficiency virus (HIV), the virus that causes AIDS. However, HBV is 50 to 100 times more infectious than HIV.
The main ways of getting infected with HBV are:

- Perinatal (from mother to baby at the birth);
- Child- to-child transmission;
- Unsafe injections and transfusions;
- Sexual contact.

Worldwide, most infections occur from infected mother to child, from child to child contact in household settings, and from reuse of unsterilized needles and syringes. In many developing countries, almost all children become infected with the virus.

In many industrialized countries (e.g. Western Europe and North America), the pattern of transmission is different. In these countries, mother-to-infant and child-to-child transmission accounted for up to one third of chronic infections before childhood hepatitis B vaccination programmes were implemented. However, the majority of infections in these countries are acquired during young adulthood by sexual activity, and injecting drug use. In addition, hepatitis B virus is the major infectious occupational hazard of health workers, and most health care workers have received hepatitis B vaccine.

Hepatitis B virus is not spread by contaminated food or water, and cannot be spread casually in the workplace.

Can chronic hepatitis B and liver cancer be treated?

Liver cancer is almost always fatal, and usually develops between 35 and 65 years of age, when people are maximally productive and with family responsibilities. The loss of a mother or a father in a developing country can devastate the entire family. In developing countries, most people with liver cancer die within months of diagnosis. In industrialized countries, surgery and chemotherapy can prolong life up to a few years. Chronic hepatitis B in some patients is treated with drugs called *interferon or lamivudine*, which can help some patients. However, *interferon* or l*amivudine* therapy costs thousands of dollars and will never be available to most patients in developing countries. Patients with cirrhosis are sometimes given liver transplants, with varying success. It is preferable to prevent this disease with vaccine than to try and cure it.

How safe and effective is the vaccine?

Hepatitis B vaccine has an outstanding record of safety and effectiveness. Since 1982, over one billion doses of hepatitis B vaccine have been used worldwide. The vaccine is given as a series of three intramuscular doses. Studies have shown that the vaccine is 95% effective in preventing children and adults from developing chronic infection if they have not yet been infected. In many countries where 8% to 15% of children used to become chronically infected with HBV, the rate of chronic infection has been reduced to less than 1% in immunized groups of children.

How is WHO trying to control Hepatitis B?

Since 1991, WHO has called for all countries to add hepatitis B vaccine into their national immunization programmes. As of March 2000, 116 countries had included hepatitis B vaccine in their national programmes including most countries in Eastern and South- East Asia, the Pacific Islands, Australia, North and South America, Western Europe and the Middle East. However, many low income countries in sub-Saharan Africa, the Indian subcontinent and in the Newly Independent States do not use the vaccine. The price of the hepatitis B vaccine has been one of the main obstacles to its introduction in many of these countries.

The Global Alliance for Vaccines and Immunization (GAVI) was created in 1999. It is a unique coalition of public and private institutions where WHO has taken a leading role. The main mission of GAVI is to vaccinate as many children as possible against vaccine-preventable diseases. GAVI has introduced a new approach to international health funding: the Global Fund for Children's vaccines (GFCV). This fund will help 74 low-income countries to reinforce their national vaccine programmes and introduce hepatitis B, yellow fever and haemophilus influenzae type b(Hib) vaccines into their national immunization programmes.

For further information, please contact the Office of the Spokesperson, WHO, Geneva. Tel (+41 22) 791 2599. Fax (+41 22) 791 4858. Email: inf@who.int. All WHO Press Releases, Fact Sheets and Features as well as other information on this subject can be obtained on Internet on the WHO home page. http://www.who.int.

HEPATITIS C

Hepatitis C is a viral infection of the liver which had been referred to as parenterally[1] transmitted "non A, non B hepatitis" until identification of the causative agent in 1989. The discovery and characterization of the hepatitis C virus (HCV) led to the understanding of its primary role in post-transfusion hepatitis and its tendency to induce persistent infection.

HCV is a major cause of acute hepatitis and chronic liver disease, including cirrhosis[2] and liver cancer. Globally, an estimated 170 million persons are chronically infected with HCV and 3 to 4 million persons are newly infected each year. HCV is spread primarily by direct contact with human blood. The major causes of HCV infection worldwide are use of unscreened blood transfusions, and re-use of needles and syringes that have not been adequately sterilized.

No vaccine is currently available to prevent hepatitis C and treatment for chronic hepatitis C is too costly for most persons in developing countries to afford. Thus, from a global perspective, the greatest impact on hepatitis C disease burden will likely be achieved by focusing efforts on reducing the risk of HCV transmission from nosocomial [3]exposures (e.g. blood transfusions, unsafe injection practices) and high-risk behaviours (e.g. injection drug use).

Pathogen

Hepatitis C virus (HCV) is one of the viruses (A, B, C, D, and E), which together account for the vast majority of cases of viral hepatitis. It is an enveloped RNA virus in the *flaviviridae* family which appears to have a narrow host range. Humans and chimpanzees are the only known species susceptible to infection, with both species developing similar disease.

An important feature of the virus is the relative mutability of its genome, which in turn is probably related to the high propensity (80%) of inducing chronic infection. HCV is clustered into several distinct genotypes which may be important in determining the severity of the disease and the response to treatment.

Clinical features of acute infection

The incubation period of HCV infection before the onset of clinical symptoms ranges from 15 to 150 days. In acute infections, the most common symptoms are fatigue and jaundice; however, the majority of cases (between 60% and 70%), even those that develop chronic infection, are asymptomatic.

[1] Parenterally: administrated by any way other than through the mouth, for example, by the introduction of drugs or other agents into the body by injections.
[2] Cirrhosis: progressive disease of the liver characterized by diffuse damage to hepatic parenchymal cells.
[3] Nosocomial : hospital acquired.

Chronic infection and consequences

About 80% of newly infected patients progress to develop chronic infection. Cirrhosis develops in about 10% to 20% of persons with chronic infection, and liver cancer develops in 1% to 5% of persons with chronic infection over a period of 20 to 30 years. Most patients suffering from liver cancer who do not have hepatitis B virus infection have evidence of HCV infection. The mechanisms by which HCV infection leads to liver cancer are still unclear. Hepatitis C also exacerbates the severity of underlying liver disease when it coexists with other hepatic conditions. In particular, liver disease progresses more rapidly among persons with alcoholic liver disease and HCV infection.

Means of transmission

HCV is spread primarily by direct contact with human blood. Transmission through blood transfusions that are not screened for HCV infection, through the reuse of inadequately sterilized needles, syringes or other medical equipment, or through needle-sharing among drug-users, is well documented. Sexual and perinatal transmission may also occur, although less frequently. Other modes of transmission such as social, cultural, and behavioural practices using percutaneous procedures (e.g. ear and body piercing, circumcision, tattooing) can occur if inadequately sterilized equipment is used. HCV is not spread by sneezing, hugging, coughing, food or water, sharing eating utensils, or casual contact.

In both developed and developing countries, high risk groups include injecting drug users, recipients of unscreened blood, haemophiliacs, dialysis patients and persons with multiple sex partners who engage in unprotected sex.

In developed countries, it is estimated that 90% of persons with chronic HCV infection are current and former injecting drug users and those with a history of transfusion of unscreened blood or blood products.

In many developing countries, where unscreened blood and blood products are still being used, the major means of transmission are unsterilized injection equipment and unscreened blood transfusions. In addition, people who use traditional scarification and circumcision practices are at risk if they use or re-use unsterilized tools.

Prevalence

WHO estimates that about 170 million people, 3% of the world's population, are infected with HCV and are at risk of developing liver cirrhosis and/or liver cancer. The prevalence of HCV infection in some countries in Africa, the Eastern Mediterranean, South-East Asia and the Western Pacific (when prevalence data are available) is high compared to some countries in North America and Europe.