

Hepatitis B and Hepatitis B vaccine what is the importance?

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Abstract

Two billion people, or one in three, have been infected with hepatitis B worldwide. Of these, about 260 million live with chronic hepatitis B. Each year about 900,000 people die from hepatitis B worldwide, and about 2,000 of these deaths occur in the United States. Hepatitis B is transmitted through blood and is 100 times more infectious than HIV. An estimated one billion infectious viruses are in one-fifth of a teaspoon of blood of an infected person, so exposure to even a minute amount, such as on a shared toothbrush can cause infection. Hepatitis B is sometimes referred to as the "silent epidemic" because most people who are infected do not experience any symptoms. Liver cancer is the fourth leading cause of cancer deaths throughout the world, behind lung, colorectal and stomach cancers. Almost half of liver cancers are caused by chronic infection with hepatitis B. The World Health Organization (WHO) recommends the inclusion of hepatitis B vaccine in immunization programs of all countries; in 2017, about 8 of 10 infants born throughout the world received three doses of hepatitis B vaccine. People are protected against hepatitis B virus infection by making an immune response to a protein that sits on the surface of the virus. When hepatitis B virus grows in the liver, an excess amount of this surface protein is made. The hepatitis B vaccine is made by taking the part of the virus that makes surface protein ("surface protein gene") and putting it into yeast cells. The yeast cells then produce many copies of the protein that are subsequently used to make the vaccine. When the surface protein is given to children in the vaccine, their immune systems make an immune response that provides protection against infection with the hepatitis B virus. The first hepatitis B vaccine was made in the 1980s by taking blood from people infected with hepatitis B virus and separating or purifying the surface protein from the infectious virus. Because blood was used, there was a risk of contaminating the vaccine with other viruses that might be found in blood, such as HIV. Although contamination with HIV was a theoretical risk of the early, blood-derived, hepatitis B vaccine, no one ever got HIV from the hepatitis B vaccine. That is because the blood used to make vaccine was submitted to a series of chemical and treatments that inactivated any possible contaminating virus. Today, there is no risk of contaminating the vaccine with other viruses because the surface protein is manufactured in the laboratory.

Does the hepatitis B vaccine have side effects?

Some children will develop pain or soreness in the local area of the shot, and low-grade fever. There is one extremely rare, but serious, side effect. About 1 out of every 600,000 doses of the hepatitis B vaccine will cause a severe allergic reaction, called anaphylaxis, with symptoms including swelling of the mouth, difficulty breathing, low blood pressure or shock. Anaphylaxis usually occurs within 15 minutes of receiving the vaccine. Although anaphylaxis can be treated, it is quite frightening. People should remain at the doctor's office for about 15 minutes after getting the vaccine. Although the hepatitis B vaccine is made in yeast cells, no one has ever been shown to be allergic to the yeast proteins contained in the hepatitis B vaccine.

Received: March 03, 2022; **Accepted:** March 08, 2022; **Published:** March 18, 2022