



Beethoven's DNA Shows Hepatitis B Infection, Liver Disease

DNA evidence found that Ludwig van Beethoven had a hepatitis B infection during his final months alive.

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DNA pulled from strands of Ludwig van Beethoven's hair suggests that the German composer had health problems associated with his liver that likely led to his death at age 56 nearly 200 years ago.

A study published in [Current Biology](#) found that Beethoven had a genetic risk for [liver failure](#), consumed [alcohol](#) frequently and had a liver-damaging [hepatitis B](#) infection toward the end of his life. The infamously deaf composer had written that he wanted doctors to study his health issues after he died, according to an [Associated Press](#) (AP) article.

"With Beethoven in particular, it is the case that illnesses sometimes very much limited his creative work," study coauthor Axel Schmidt, MD, a geneticist at University Hospital Bonn in Germany, told AP. "And for physicians, it has always been a mystery what was really behind it."

In the final months of Beethoven's life, many of his loved ones clipped locks of his hair and preserved them as keepsakes, according to the AP. Thanks to advancements in DNA, researchers were able to utilize this genetic evidence to delve into the composer's health history and cause of death.

Testing DNA one strand at a time was tedious but necessary to confirm the hair did, in fact, belong to Beethoven. Using nearly 10 feet of Beethoven's hair, researchers pieced together a genome that could indicate signs of genetic disease, according to study coauthor Johannes Krause, PhD, a paleogeneticist at the Max Planck Institute for Evolutionary Anthropology in Germany.

While researchers couldn't confidently identify the cause of Beethoven's hearing loss or gastrointestinal issues, the discovery of the composer's predisposition for [liver disease](#), alcohol consumption and hepatitis B infection "all present plausible causal factors in his liver disease, although the exact causal pattern cannot presently be determined," according to the [study](#).

To learn more about [#Hepatitis B](#), read Hep's [Health Basics on Hepatitis B](#). It reads in part:

What is Hepatitis B?

Hepatitis B virus (HBV) is a highly contagious viral infection that can cause liver damage. The virus is easily spread via hep B-positive blood, semen or other body fluid. Pregnant women who have hepatitis B can also transmit the virus to their babies, usually during birth. People who have not been infected with HBV can be vaccinated against the virus to prevent infection.

Because of routine HBV vaccination, the number of new hepatitis B infections in the United States has declined from about 260,000 a year in the 1980s to nearly 21,000 in 2016, with the greatest decline occurring in children and adolescents.

Worldwide, more than 2 billion people have been infected with hepatitis B at some point, resulting in 257 million people with chronic infections. Globally, roughly 887,000 people die from HBV-related liver disease each year. According to the Centers for Disease Control and Prevention (CDC), an estimated 850,000 people in the United States have chronic HBV infection. Some experts believe there are up to 2.2 million people with hepatitis B in the United States.

Transmission

Hepatitis B virus (HBV) is highly contagious and may be present in blood and body fluids, including semen and vaginal secretions. The saliva of people with hep B may contain evidence of the virus but in such small concentrations that kissing does not spread HBV. Here are the most common ways hepatitis B is transmitted:

- Sex with an infected partner;
- Acquired at birth from an infected mother;
- Sharing injection drug equipment (including needles, syringes, cookers, drug-preparation equipment);
- Contact with blood or open sores of an infected person;
- Needlestick or other skin puncture;
- Sharing items such as glucose monitors, razors or toothbrushes with an infected person.

Hepatitis B may also be spread through non-injection drugs, such as cocaine and crack via straws and pipes, as a result of exposure to blood. An unsterilized instrument may transmit HBV during acupuncture, tattooing and body piercing. A human bite may spread hepatitis B.

Hepatitis B Prevention

The best way to prevent hepatitis B virus (HBV infection) is to be vaccinated. A new

HBV vaccine (Heplisav-B) was approved for adults over age 18 years. Heplisav-B is given in two doses one month apart. Two older HBV vaccines are available: Recombivax HB and Engerix-B. Both vaccines require three injections administered over a six-month period. The side effects of the hepatitis B vaccine are usually mild and may include soreness at the injection site and mild flu-like symptoms.