

Androgen boosts hepatitis B virus replication

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Androgen enhances replication of hepatitis B virus (HBV), rendering males more vulnerable than females to this virus, according to research published in the February *Journal of Virology*.

“Our studies allowed us to understand the gender disparity of HBV carriers, and why this virus tends to cause more severe liver disease in men than in women,” says principal investigator James Ou of the University of Southern California.

The researchers found no difference between levels of virus in prepubescent male and female mice. However, post-puberty, levels in males exceeded those in [females](#), in some cases by more than double, says Ou. Subsequently castrating male mice reduced the viral load, but injecting castrated mice with an androgen agonist resulted in a rising viral load again.

In a third set of experiments, the researchers removed the androgen receptor by genetic knockout, once again abolishing the androgen’s effect on [hepatitis B replication](#). Then they drilled down still further, discovering elements within the HBV genome which are recognized by the host’s activated androgen receptor, which then boosts viral gene expression and replication.

Epidemiologic studies have shown that men are three to seven times more likely than women to become HBV carriers, and male HBV carriers are more likely to develop cancer of the liver (hepatocellular carcinoma) than female carriers.

“[Hepatitis B virus](#) is one of the most important human pathogens,” says Ou. “Approximately 350 million people worldwide are chronically infected, and roughly one million die annually.”

HBV can be transmitted sexually, as well as via non-sterile needles, and perinatally. In areas where the virus is endemic, it is frequently transmitted among young children. It is present in blood (including menstrual blood), vaginal secretions, saliva, semen, breast milk, and to a lesser extent in other bodily fluids. A vaccine is available for HBV.

More information: Y. Tian, C.f. Kuo, W.-l. Chen, and J.-h.J. Ou, 2012. Enhancement of hepatitis B virus replication by androgen and its receptor in mice. *J. Virol.* 86:1904-1910.

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