Hepatitis B Virus–Induced Liver Cancer in Asian Americans: A Preventable Disease

By Gail McBride

During his years in the U.S. and Hong Kong, Samuel So, M.B., professor of surgery and director of the liver cancer program at Stanford University School of Medicine, has seen both too much and too little: too much liver cancer caused by hepatitis B virus (HBV) and too few efforts to stop it.

"This is the most neglected global epidemic," So said.

To address this problem—particularly among Asian Americans, who suffer disproportionately from HBV infection and liver cancer compared with other U.S. groups—So and his colleagues have launched programs to raise awareness of the cancer connection and to treat and manage chronic HBV infections.

HBV is endemic in almost all Southeast Asian countries, some of the Pacific Islands, and many other areas of the world. According to the World Health Organization, 5% of the world's population has a chronic hepatitis B infection—10 times more than the estimated number of people who are infected with human immunodeficiency virus. "And every year, between 700,000 and 1 million people die" from HBV-related diseases, including liver cancer, So said.

"One-third of the Chinese population is 19 or under, so you potentially have 350 million unprotected kids. You have to protect these kids."

Thanks to widespread vaccination, the U.S. in general does not suffer from high rates of HBV infection. U.S. infection rates fell by 78% between 1991 and 2005, according to data from the Centers for Disease Control and Prevention. Nonetheless, chronic HBV infection is still prevalent among Asian Americans. About 10% of Americans of Asian and Pacific Islander descent have chronic hepatitis B infections, compared with 0.1% of white Americans. Because of this, So said, liver cancer is the second-leading cause of cancer death among Asian American men, whereas it doesn't even reach the top 10 among white men in the U.S.

"This is the most significant cancer health disparity affecting Asian Americans in the U.S.," said Moon S. Chen, Jr., Ph.D., associate director for disparities and research at the University of California Davis Cancer Center, at a recent conference on cancer health disparities sponsored by the American Association for Cancer Research.

Samuel So, M.B.

In the U.S., infants born to HBV-infected women are supposed to be given hepatitis immunoglobulin and the first of three doses of the HBV vaccine within 12 hours of birth. Yet many Asian American children, particularly those not born in medical settings, still contract HBV at birth, said Nancy Reau, M.D., an assistant professor of medicine who specializes in liver disease at the University of Chicago. Many factors account for this outcome, she said, including a lack of health insurance. Also, some women may be unaware that they have HBV or that they can pass it on to their newborns,

leading them to seek only minimal or no prenatal care.

To address these problems, several campaigns are under way. Perhaps the best known is the San Francisco Hep B Free Campaign, which aims to make San Francisco the first HBV-free city in the U.S. Reaching this goal would help reduce liver cancer rates in the city, which are currently the highest in the nation. The plan is to screen, vaccinate, and treat all of San Francisco's Asian and Pacific Islander residents—who make up about a third of the city's population—for HBV. The campaign, which kicked off last year, will promote routine blood tests for HBV in the Asian and Pacific Islander community, making sure the results get to the city's health department; improve referrals and access to care for people with chronic HBV; increase the number of San Francisco hospitals that offer low-cost or free screening and vaccinations for HBV; and educate physicians about the need for lifelong management of patients with chronic HBV.

"When we find these people who are infected with HBV, we have to determine whether their livers are damaged," So said. "If their livers are showing problems, about six antiviral drugs are available for treatment of HBV. But many of those infected people may not need treatment at this point." Rather, So said, they just need to be monitored by medical professionals to possibly avoid the development of liver cancer or other problems.

Another campaign, carried out through an NCI-funded cooperative group known as the Asian American Network for Cancer Awareness, Research, and Training (AANCART), hopes to increase the proportion of Asian American adults who are tested for HBV infection. UC Davis's Chen, who is the principal investigator of AANCART, and colleagues are currently concentrating on Vietnamese, Hmong, and Korean Americans living in three California cities because these groups face a particularly high burden of the disease. Vietnamese American males have the highest incidence rate of liver cancer in the U.S. (41.8 per 100,000), followed by Hmong American males (25.7 per 100,000). Among women, Korean Americans have the highest incidence rate of liver cancer (10.0 per 100,000), followed by Hmong Americans (8.8 per 100,000). In contrast, liver cancer incidence rates among non-Hispanic whites in the U.S. are 3.7 per 100,000 for males and 1.5 per 100,000 for females.

Some programs are even making small inroads into the HBV problem in mainland China. In 2006 and 2007, a group from Stanford's Asian Liver Center, which So heads, provided free vaccinations and HBV education to more than half a million grade school children in Qinghai, China. "One-third of the Chinese population is 19 or under, so you potentially have 350 million unprotected kids," So said. "You have to protect these kids."

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Understanding HBV-Induced Liver Cancer

Just how HBV causes liver cancer is not yet well understood, and the study of this process is an active area of research. Chronic inflammation of the liver caused by the body's immune response to the virus and the consequent regeneration of liver cells probably play a role. Several studies also have suggested that persistent HBV replication in the body of the infected person—indicated by a high concentration of HBV DNA in the serum—may be associated with cancer development. Other research has shown that when DNA from HBV integrates into the genomes of liver cells, it can cause cancer-inducing changes in the cellular genes—perhaps tumor suppressor genes—and possibly introduce deleterious HBV genes as well.

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