

A comprehensive national strategy to eliminate hepatitis B in China should include an expanded national immunization program to provide free catch-up vaccination for every child and adolescent in addition to universal newborn vaccination

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In China, it is HBV and not HIV that is the most common serious viral infection. Yet unlike HIV, there is no large-scale national awareness campaign to educate the public and healthcare professionals in China about HBV. A comprehensive national strategy that will lead to the elimination and control of hepatitis B is a top public health priority in China. The threat of HBV to the health of the nation is frequently under-recognized by epidemiologists, policy makers and the public because unlike the influenza virus, it is often not the acute infection that makes people sick, but the consequences of chronic HBV infection that occurs after 20-30 years. The WHO estimates that 10% of HBV related deaths are caused by acute hepatitis, 70% from liver cancer and 20% from cirrhosis. Chronic HBV infection is the major reason behind two common causes of premature death in China: chronic liver disease and liver cancer. Hence prevention of chronic HBV infection is the primary objective of a comprehensive national HBV strategy.

Compared with 650,000 people chronically infected with HIV/AIDS, one tenth of the populations in China (120-130 million people) are hepatitis B carriers. As many as 18% of the population in some provinces, are HBV carriers. China, in fact, has the greatest burden of hepatitis B and liver cancer in the world. China accounts for one third of the estimated 360 million people living with chronic HBV infection worldwide and over half of the estimated 662,000 deaths worldwide from liver cancer. The official death rate from HBV in China is an estimated 330,000. And the cost of treatment of chronic HBV, cirrhosis and liver cancer including liver transplantation is already astronomical.

The liver disease and cancer caused by HBV takes a heavy toll in terms of lives, national resources, and productivity and healthcare costs in China. Although HBV is not a virus that is transmitted by casual contact or by sharing food or drinks, myths and misunderstanding about disease transmission have caused some hepatitis B carriers to be shunned from school, work or normal activities. Hence, the stigmatization of those with HBV in China has created a serious psychosocial problem that is not seen in many parts of the world.

Fortunately, hepatitis B is a vaccine preventable disease. Global eradication is therefore possible if everyone worldwide receives the HBV vaccine before they become infected. Hepatitis B is a blood borne infection that is transmitted by 1) by an infected mother to the newborn, 2) contact with infected blood through unsafe injection, transfusion, open wounds, and sharing toothbrush or razors, and 3) unprotected sex. Approximately 90% of newborns infected with HBV develop chronic infection, whereas 30-50% of children under age 5 years, 10% of adolescents aged 15 years, and 2-5% of older individuals develop chronic infection. In countries like China, the WHO estimates that vertical transmission from mother to child accounts for 40-50%, horizontal transmission during childhood accounts for 40-50% and adult infection accounts for less than 10% of the cases of chronic HBV infection. Vaccination of all newborns at birth, catch-up vaccination for all unvaccinated children and adolescents is the most cost effective method to prevent new cases of chronic HBV infection. The recombinant hepatitis B vaccine is a very safe and effective vaccine that is usually administered in 3 shots over a 6 months period and can provide long term protection against HBV. And if every child and young adults are vaccinated, there is absolutely no excuse to prevent HBsAg positive children from attending school or college. Although the recombinant vaccine has been available for many years and vaccine cost has plummeted from US \$50 per dose to less than 60 cents per dose, yet millions of people worldwide still become infected every year because they have not been vaccinated.

China has taken the first major step towards the ultimate elimination of HBV by providing universal free newborn vaccination since 2002. The success of the collaborative China-GAVI program led to expansion of the program to children under 3 years of age in 2006. However, without instituting a national catch-up vaccination program to immunize children and adolescents and even young adults who have not been vaccinated, it would take an extremely long time to achieve the goal of HBV elimination in the country.

The rationale, evolution, success and lessons learnt from the national HBV vaccination strategy to eliminate HBV transmission in the U.S. serve as an excellent model that could be modified and adopted in China. After the adoption of this national strategy, HBsAg prevalence rate in Asian American children in Hawaii dropped from 1.6% in 1989 to 0.04% in 2001, and from 6.6% in 1986 to 0.6% in 2002 in Georgia. The rate of acute hepatitis B in children (less than 19 years old) decreased 89% between 1990 and 2002. In 2004, the reported incidence of acute HBV infection in children aged less than 12 years and aged 12-19 years dropped to 0.36 and 2.8 cases/100,000 population in the U.S..

Although the prevalence of chronic HBV is only 0.2% in the U.S. (compared with 10% in China), a universal newborn HBV vaccination program was instituted in 1991 in an effort to eliminate HBV transmission in the U.S. This initiative is funded under the Vaccines for Children (VFC) program approved by the U.S. Congress in 1994 to provide annual federal funding for free vaccination for any child under 19 years of age who has no health insurance. Since the pace to eliminate HBV will be too slow with newborn vaccination alone, in 1995 the US launched a catch-up vaccination program for children 11-12 years.

In 1999, the program was further expanded to provide coverage for any child less than 19 years of age who has not been vaccinated. Testing for HBV is not required, but in many states such as California, proof of HBV vaccination is now required for entry into grade school, middle school, high school and college.

The U.S. strategy also calls for universal screening of all pregnant women for HBsAg since 1988, and the creation of a federal program that funds prenatal hepatitis B coordinators in every state to ensure the newborns of HBsAg positive mothers complete the hepatitis B vaccine series. Recently in 2005, to assure all newborns receive timely vaccination, the U.S. adopted the recommendation that all newborns receive the first dose of HBV vaccine at birth (birth dose). It also recommends that all HBsAg positive mothers receive information about the risks of HBV, mode of transmission, and appropriate methods of follow up and treatments. Pregnant mothers who are unprotected are also recommended to receive the hepatitis B vaccine.

As of 2006, nearly 400 million members (30.3%) of China's total population are children and adolescents aged 0 to 19 years. About 272 million are 0-14 years of age and are particularly vulnerable to developing chronic HBV infection if they become infected. Since 50-60% of chronic HBV infection is due to horizontal transmission during early childhood, the current program in China that offers free vaccination for children under 3 years of age fall short of protecting millions of young children who have not been vaccinated.. If the assumption is made that the unvaccinated young population will develop chronic HBV infection at the same rate as earlier generations, resulting in a 10-15% population-wide prevalence of chronic infection, then as many as 40 million of this group will be chronically infected within the next several years. Because 15-25% of chronic HBV carriers eventually die from liver cancer or liver failure if left untreated, between 6 and 10 million members of China's young population may die from the consequences of HBV infection.

The low cost of recombinant HBV vaccine combined with a vibrant Chinese economy provide the perfect opportunity to adopt and implement an expanded comprehensive national immunization program that will provide catch-up vaccination to protect all the children and adolescents in China who have not been vaccinated. A national strategy that include a national awareness campaign, universal testing of pregnant mothers, universal newborn vaccination, and an expanded program to provide free catch-up vaccination for children and adolescents who have not been vaccinated can lead to the elimination of hepatitis B in the next 20 years in China. In 1980, smallpox was eradicated in China and worldwide through universal vaccination. For the sake of our children and generations to come, it's time to act now to eliminate HBV in China.

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