How to Achieve Global Control of Hepatitis B Virus Infection

Mei-Hwei Chang

Distinguished Chair Professor, Department of Pediatrics, College of Medicine, National Taiwan University

Hepatitis B virus (HBV) infection is a major global health problem. It can cause both acute and chronic hepatitis, which may lead to cirrhosis and liver cancer. According to WHO IARC's World Cancer Report 2014, liver cancer is the 2nd most common cause of cancer dearth globally in 2012. HBV related liver cancer is particularly prevalent in developing world.

The world first universal hepatitis B immunization program was launched in Taiwan since July 1984. HBV vaccination has become part of the WHO global immunization program, resulting in major declines in acute and chronic HBV infection worldwide. Approximately 90 % of the prevalence of chronic HBV infection in children and young adults has been reduced remarkably in areas where universal HBV vaccination in infancy has been successfully introduced. We have provided the first evidence to support the effect of primary liver cancer prevention by universal HBV immunization. Successful liver cancer prevention effect was later also reported in other areas such as Khon Kaen, Thailand and Alaska, U.S.A., etc.

In spite of great success, the difficulties of global control of HBV infection and liver cancer include inadequate resources, poor compliance, and vaccine failure. Mother-to-infant transmission from highly infectious mothers is the main cause of vaccine failure. Better strategies to prevent mother-to-infant transmission of HBV, to increase the global coverage rate of HBV immunization are needed to achieve better liver cancer prevention effect. Clinical trial using antiviral agent to reduce maternal HBV viral load during the third trimester of pregnancy successfully reduced the rate of mother-to- infant transmission of HBV. Further studies to clarify the long term benefit, safety, and efficacy in preventing intra-uterine/perinatal HBV infection are needed.

In those who are chronically infected by HBV, antiviral therapy to treat subjects of hepatitis B with active viral replication have beneficial effect in preventing HBV- related complication and liver cancer. Evidence has supported that the liver cancer risk is significantly reduced among cirrhotic patients with sustained virologic response to anti-viral therapy. Screening for subjects with chronic HBV infection is needed, in order to pick up the high risk subjects of liver cancer. Regular follow-up of those high risk subjects is helpful to find out the suitable target subjects for secondary prevention. For liver cancer patients who have been treated successfully bysurgical resection, local therapy or liver transplantation, tertiary prevention of HCC using antiviral therapy against HBV may potentially prevent late cancer recurrence.

In conclusion, to achieve global control of HBV infection, continuous efforts should be started from fetal and neonatal period, to completely block maternal transmission of HBV. Though less cost-effective than primary prevention with immunization, using antiviral therapy to treat hepatitis

B is another method to reduce liver injury and to prevent liver cancer. However, cccDNA could not be eradicated by current antiviral therapy in most occasions. Effective and safe new antiviral and immune-modulatory therapies to effectively eradicate HBV as early as possible are anticipated.