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Advances in the diagnosis and treatment of viral hepatitis B and C in China

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Chronic infection of hepatitis B virus (HBV) and hepatitis C virus (HCV) pose a serious public health burden worldwide. In the past three decades, China has made enormous efforts and achieved remarkable progresses in the prevention, diagnosis, and treatment of chronic hepatitis B (CHB) and C (CHC).[1]

Since the adoption of universal vaccination against hepatitis B for newborns in 1992, the prevalence of hepatitis B surface antigen (HBsAg) in the general population declined from 9.7% in 1992 to 6.2% in 2016,[2] with HBsAg positive rate in children <5 years old declining to 0.3%.[1] The addition of a birth dose of hepatitis B immunoglobulin for infants born to HBsAg positive mothers, and oral antiviral therapy during the third trimester of pregnancy for women with high HBV DNA have further reduced the mother to child transmission (MTCT) rate of HBV to nearly zero.[3] The ongoing triple elimination program for the prevention of MTCT of HIV, syphilis, and HBV will further reduce the prevalence of HBsAg in the young age group.[4]

The ban of paid blood donors and stringent screening of volunteer blood donors since 1998, together with safe injections in healthcare settings and harm reduction in people who inject drugs (syringe exchange and methadone replacement program), reduced the prevalence of HCV in the general population from 3.2% in 1992 to 0.7% in 2016.[2]

In addition to the conventional serum markers and the viral load quantifications, novel serum markers for HBV infection, including the quantification of HBsAg and anti-HBc, hepatitis B core-related antigen, and pre-genomic HBV RNA (pgRNA) has been extensively explored and validated for better disease staging, progress monitoring, and efficacy assessment. Non-invasive modality to assess liver fibrosis, such as transient elastography for liver stiffness measurement has been validated in large cohorts of CHB patients.[5,6] Serum markers for fibrosis have been extensively validated in a multicenter clinical cohort of CHB.[7] To facilitate the evaluation of the histological regression of liver fibrosis, a new classification (Beijing Classification) has been proposed, which could identify the trend of fibrosis changes on a single liver biopsy (predominantly progressive, indeterminate, and predominately regressive, P-I-R score).[8]

In the last decade, both the quantity and quality of clinical research on the treatment of CHB or CHC have dramatically improved in China.[9] The antiviral efficacy of first-line nucleo(s)tide analogs (NAs) has been proved by real-world studies.[10,11] Evidence from several studies in China indicated that adding or switching to pegylated interferon (Peg-IFN) in NA-treated patients with a low level of HBsAg (<1500 IU/mL) could achieve much higher rates of HBsAg loss.[12] Furthermore, prospective studies showed that Peg-IFNα therapy could reach high rates of HBsAg clearance in patients at inactive HBsAg carrier status and in children <6 years old.[13,14]

The clinical guidelines on the prevention and treatment for CHB and CHC have been published and updated by the Chinese Society of Hepatology and the Chinese Society of Infectious Diseases. The latest guidelines on CHB (2019 version) have expanded the treatment indication by decreasing the thresholds of HBV DNA and alanine transaminase levels to benefit more patients,[15] thereby reducing the disease burden at a population level. Retrospective analysis of an administrative database indicated that diagnosis and treatment rates of CHB have increased steadily after the inclusion of antiviral agents for HBV in the reimbursement list in Beijing.[16,17] As a consequence, the liver-related death for CHB patients had

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been decreased since the coverage of antiviral therapy by reimbursement list of basic medical insurance in 2011.[16] The proportion of entecavir (ETV) and tenofovir disoproxil fumarate (TDF) in the prescribed antiviral agents had increased from 13.5% in 2003 to 79.7% in 2016 as shown by an analysis of the China Registry of Hepatitis B.[18] In 2019, the price of generic ETV and TDF has reduced by 90%, and the price of propriety ETV, TDF, and tenofovir alafenamide fumarate has also dramatically reduced.[19] Both pan-genotypic and genotype-specific direct-acting antiviral agents (DAAs) for HCV recommended by the major international and national guidelines have been proved in China. After massive price reduction through governmental negotiation, all of these highly efficacious DAAs have been included in the reimbursement list of the basic social health insurance. All these measures have dramatically increased the availability and affordability of antiviral therapy for HBV and HCV.

However, challenges still exist in the treatment of CHB and CHC. According to estimates, in China, only around 25% of all HBV and 30% of all HCV cases were actually diagnosed, and 17% of CHB and 9% of CHC patients eligible for treatment were actually treated.[2] Studies suggested that scaling up of the test-and-treat strategy could dramatically reduce HBV- or HCV-associated mortality, which is cost-effective or even cost-saving. Therefore, continuous efforts to improve the awareness of HBV and HCV and resource allocation on their prevention, test, and treatment are still needed to eliminate viral hepatitis as a public health threat by 2030.

Conflicts of interest

None.

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