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REVIEW

# The epidemiological changes of HCV and HBV infections in the era of new antiviral therapies and the anti-HBV vaccine



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Received 26 December 2014; received in revised form 24 April 2015; accepted 16 May 2015

## KEYWORDS

Epidemiology;  
Hepatitis B virus;  
Hepatitis C virus;  
Acute viral hepatitis;  
Chronic liver disease

**Summary** The World Health Organization (WHO) resolution adopted in 2010 recognized viral hepatitis as a global health problem. In April 2014, for the first time, the WHO produced guidelines for the screening, care and treatment of persons with hepatitis C infections. In May 2014, a follow-up resolution urged WHO Member States to develop and implement a national strategy for the prevention, diagnosis and treatment of viral hepatitis based on the local epidemiological context. Although blood donor screening, which began in the early 1990s, has reduced the spread of the virus in the population, the WHO estimates that 150 million people are chronically infected with hepatitis C virus (HCV) and are at an increased risk of developing liver cirrhosis and hepatocellular carcinoma. In addition, 3–4 million people are infected each year. HCV treatment is currently evolving rapidly, and several drugs are in various stages of development.

With regard to the hepatitis B virus (HBV), in March 2015, the WHO published the first guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection, which were designed to complement the recent guidelines on HCV. Although the introduction of an effective vaccine against the hepatitis B virus has reduced the prevalence and health and economic impact of hepatitis B in industrialized countries, the WHO estimates that more than 2 billion people are HBV-infected and 350 million people are chronic carriers.

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## The state of the art

In 2010, the World Health Organization (WHO) resolution recognized viral hepatitis as a global health problem and stressed the need to implement measures for its prevention, diagnosis and treatment [1]. On May 24th, 2014, a follow-up resolution urged WHO Member States to develop and implement a national strategy based on epidemiological data. These measures have not yet been implemented in many countries. The spectrum of viral hepatitis changes in relation to the etiological agents in different geographical areas of the world [2].

Although the screening of blood donors, which started in the early 1990s, has reduced the spread of hepatitis C virus (HCV) in the population, the WHO estimates that 150 million people, i.e., approximately 3% of the world's population, are chronically infected with HCV and are at an increased risk of developing liver cirrhosis and hepatocellular carcinoma [3]. The incidence of hepatocellular carcinoma increases in both sexes with age. In HCV-positive patients, the cumulative risk of developing hepatocellular carcinoma in the 40–74 age group is 21.6% among males and 8.7% among females. A gradual increase in risk was observed with increased serum levels of alanine aminotransferase or with decreased basal levels of serum cholesterol [4]. In addition to this, 3–4 million people are infected each year. The WHO estimates that 15 million people are currently HCV-infected in European countries [5].

For the first time, the WHO has produced evidence-based recommendations regarding the screening, care and treatment of patients with HCV infection. These recommendations are intended primarily for decision-makers in the ministries of health who work in low and middle-income countries. These guidelines provide country-specific treatment plans and treatment programs for infectious diseases. The guidelines are also intended to be of use to non-governmental agencies and healthcare professionals for defining the elements and services required for the treatment of HCV patients. The guidelines are also helpful for clinicians who manage HCV patients. Recommendations

on screening for HCV infection outlined that serological testing for HCV should be offered to people who are part of a population with high HCV prevalence or who have a history of exposure/risk behavior (strong recommendation, moderate quality of evidence). Tests with genomic amplification techniques for the detection of ribonucleic acid are performed immediately after a positive HCV serological test for the diagnosis of chronic HCV infection, and an assessment is required before initiating antiviral therapy (conditional recommendation, very low quality of evidence) [2]. With regard to the hepatitis B virus (HBV), in March 2015, the WHO published the first guidelines for the prevention, care and treatment of people living with chronic HBV infection. These guidelines are based on a public health approach to using antiviral drugs to treat chronic HBV, which considers feasibility and effectiveness with limited resources, for example, in places that do not have the option of performing specialized tests, such as HBV DNA testing and liver biopsy [6]. Although the introduction of an effective vaccine against the hepatitis B virus (HBV) has reduced the prevalence and the health and economic impact of hepatitis in industrialized countries [7], the WHO estimates that more than 2 billion people are infected with the virus and 350 million people are chronic carriers. There are more than 4 million clinical cases of acute HBV infection every year. In low-endemic countries, such as North America and Northern Europe, the estimated prevalence of HBsAg-positive subjects is less than 2%, while in high-endemic countries, such as sub-Saharan Africa and China, the prevalence is  $\geq 8\%$ . Italy is among the countries with intermediate endemicity (positivity for HBsAg between 2% and 7%) [7]. The WHO estimates that 13.3 million people are currently HBV-infected in the countries of the European Region [5].

High levels of viremia or an infection contracted at a young age, which mostly affects males, are associated with an increased risk of death or of developing hepatocellular carcinoma [8,9].

The impact of screening programs for viral hepatitis and HBV vaccination, which have significantly reduced viral hepatitis, have been appreciated

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