



Achieving Excellence in Hepatitis B Virus Care for Veterans in the Veterans Health Administration

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Enhancing care of veterans infected with hepatitis B virus who are in VHA care includes providing clinical guidance, informatics tools, patient monitoring, and continuous evaluation of care.

Hepatitis B is a viral infection caused by the hepatitis B virus (HBV), which is transmitted through percutaneous (ie, puncture through the skin) or mucosal (ie, direct contact with mucous membranes) exposure to infectious blood or body fluids. Hepatitis B virus can cause chronic infection, resulting in cirrhosis of the liver, liver cancer, liver failure, and death. Persons with chronic infection also serve as the main reservoir for continued HBV transmission.¹

Individuals at highest risk for infection include those born in geographic regions with a high prevalence of HBV, those with sexual partners or household contacts with chronic HBV infection, men who have sex with men (MSM), those with HIV, and individuals who inject drugs. Pregnant women also are a population of concern given the potential for perinatal transmission.²

About 850,000 to 2.2 million people in the US (about 0.3% of the civilian US population) are chronically infected with HBV.³ The prevalence of chronic HBV is much higher (10%-19%) among Asian Americans, those of Pacific Island descent, and other immigrant populations from highly endemic countries.⁴ In the US, HBV is responsible for 2,000 to 4,000 preventable deaths annu-

ally, primarily from cirrhosis, liver cancer, and hepatic failure.⁴ In the civilian US population, reported cases of acute HBV decreased 0.3% from 2011 to 2012, increased 5.4% in 2013 with an 8.5% decrease in 2014, and a 20.7% increase in 2015.⁴ Injection drug use is likely driving the most recent increase.⁵

Not all individuals exposed to HBV will develop chronic infection, and the risk of chronic HBV infection depends on an individual's age at the time of exposure. For example, about 95% of infants exposed to HBV perinatally will develop a chronic infection compared with 5% of exposed adults.⁶ Of those with chronic HBV, a small proportion will develop cirrhosis and/or hepatocellular carcinoma (HCC) with increasing risk as viral DNA concentrations increase. Additional risk factors for cirrhosis include being older, male, having a persistently elevated alanine transaminase, viral superinfections, HBV reversion/reactivation, genotype, and various markers of disease severity (HCC).⁶ Of note, chronic HBV infection may cause HCC even in the absence of cirrhosis.⁷ In addition, immunosuppression (eg, from cancer chemotherapy) may allow HBV reactivation, which may result in fulminant hepatic failure. In the Veterans Health Affairs (VHA)

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health care system, about 17% of those with known chronic HBV also carry a diagnosis of cirrhosis.

Vaccination is the mainstay of efforts to prevent HBV infection. The first commercially available HBV vaccine was approved by the FDA in 1981, with subsequent FDA approval in 1986 of a vaccine manufactured using recombinant DNA technology.⁸ In 1991, the Advisory Committee on Immunization Practices (ACIP) recommended universal childhood vaccination for HBV, with subsequent recommendations for vaccination of adolescents and adults in high-risk groups in 1995, and in 1999 all remaining unvaccinated children aged ≤ 19 years.⁹ Military policy has been to provide hepatitis B immunization to personnel assigned to the Korean peninsula since 1986 and to all recruits since 2001.¹⁰

Following publication of an Institute of Medicine/National Academies of Sciences, Engineering, and Medicine (NASEM) report, in 2011 the US Department of Health and Human Services (HHS) released the first National Viral Hepatitis Action Plan.¹¹ The current HHS Action Plan, along with the NASEM National Strategy for the Elimination of Hepatitis B and C: Phase Two Report, commissioned by the US Centers for Disease Control and Prevention (CDC), outlines a national strategy to prevent new viral hepatitis infections; reduce deaths and improve the health of people living with viral hepatitis; reduce viral hepatitis health disparities; and coordinate, monitor, and report on implementation of viral hepatitis activities.¹² The VA is a critical partner in this federal collaborative effort to achieve excellence in viral hepatitis care.

In August 2016, the HIV, Hepatitis, and Related Conditions Programs in the VA Office of Specialty Care Services convened a National Hepatitis B Working Group consisting of VA subject matter experts (SMEs) and representatives from the VA Central Office stakeholder program offices, with a charge of developing a strategic plan to ensure excellence in HBV prevention, care, and management across the VHA. The task included addressing supportive processes and barriers at each level of the organization through a public health framework and using a population health management approach.

The VA National Strategic Plan for Excellence in HBV Care was focused on the following overarching aims:

- Characterizing the current state of care for veterans with HBV in VA care;
- Developing and disseminating clinical guidance on high-quality care for patients with HBV;
- Developing population data and informatics tools to streamline the identification and monitoring of

patients with chronic HBV; and

- Evaluating VHA care for patients with HBV over time.

CARE FOR VETERANS WITH HBV AT THE VA

The VA health care system is America's largest integrated health care system, providing care at 1,243 health care facilities, including 170 medical centers and 1,063 outpatient sites of care serving 9 million enrolled veterans each year.¹³ As of January 2018, there were 10,743 individuals with serologic evidence for chronic HBV infection in VA care, based on a definition of 2 or more detectable surface antigen (sAg) or hepatitis B DNA tests recorded at least 6 months apart.¹ About 2,000 additional VA patients have a history of a single positive sAg test. These patients have unclear HBV status and require a second sAg test to determine whether they have a chronic infection.

The prevalence of HBV infection among veterans in VA care is slightly higher than that in the US civilian population at 0.4%.¹⁴ Studies of selected subpopulations of veterans have found high seropositivity of prior or chronic HBV infection among homeless veterans and veterans admitted to a psychiatric hospital.^{15,16} The data from 2015 suggest that homeless veterans have a chronic HBV infection rate of 1.0%.¹⁴ Of those with known chronic HBV infection, the plurality are white (40.4%) or African American (40.2%), male (92.4%), with a mean age of 59.9 (SD 12.0) years. According to National HIV, Hepatitis and Related Conditions Data and Analysis Group personal correspondence, the geographic territories with the largest chronic HBV caseload include the Southeast, Gulf Coast, and West Coast. As of January 2018, 1,210 veterans in care have HBV-related cirrhosis.

HBV Screening in VA

The current VA HBV screening guidelines follow those of the US Preventive Services Task Force (USPSTF).¹⁷ HBV screening is recommended for unvaccinated individuals in high-risk groups, such as patients with HIV or hepatitis C virus (HCV), those on hemodialysis, those with elevated alanine transaminase/aspartate transaminase of unknown etiology, those on immunosuppressive therapy, injection drug users, the MSM population, people with household contact with an HBV-infected person, people born to an HBV-infected mother, those with risk factors for HBV exposure prior to vaccination, pregnant women, and people born in highly endemic areas regardless of vaccination status.² The VHA recommends against standardized risk assessment and laboratory screening for HBV

infection in the asymptomatic general patient population. However, if risk factors become known during the course of providing usual clinical care, then laboratory screening should be considered.²

Of the 6.1 million VHA users in fiscal year (FY) 2016, 26% have received HBV testing, an increase from 21.8% in FY 2013, despite enrollment of nearly 500,000 new VA users since that time. Screening rates for HBV among veterans in VHA care with HIV and HCV are > 94%.¹⁸ The VHA screening rates for HBV for veterans receiving immunosuppressive therapy, who inject drugs, or who have sexually transmitted infection are estimated to be 43.9%, 53.5%, and 51.4%, respectively.¹⁸ Testing for HBV sAg in homeless US veterans is estimated at 52.8% using data from a 2015 prevalence study.¹⁴

HBV Care and VA Antiviral Treatment

In a study of an HBV care cascade, Serper and colleagues reviewed a cohort of veterans in the VA with HBV. About 50% of the patients with known chronic HBV in the VA system from 1999 to 2013 had received infectious diseases or gastroenterology/hepatology specialty care in the previous 2 years.¹⁹ Follow-up data from the National HIV, Hepatitis and Related Conditions Data and Analysis Group indicated that this remains the case: 52.3% of patients with documented chronic HBV had received specialty care from VA sources in the prior 2 years. Serper and colleagues also reported that among veterans in VHA care with chronic HBV infection and cirrhosis from 1999 to 2013, annual imaging was < 50%, and initiation of antiviral treatment was only 39%. Antiviral therapy and liver imaging were both independently associated with lower mortality for patients with HBV and cirrhosis.¹⁹

A review of studies that evaluated the delivery of care for patients with HBV in U.S. civilian populations, including retrospective reviews of private payer claims databases and chart reviews, the Kaiser Permanente claims database, and community gastrointestinal (GI) practice chart reviews, revealed similar practice patterns with those in the VA.²⁰ Across the US, rates of antiviral therapy and HCC surveillance for those with HBV cirrhosis were low, ranging from 14% to 50% and 19% to 60%, respectively. Several of these stud-

ies also found that being seen by an HBV specialist was associated with improved care.²⁰

Antiviral treatment of individuals with cirrhosis and chronic HBV infection can reduce the risk of progression to decompensated cirrhosis and liver cancer. Among current VA patients with HBV cirrhosis, 62.4% received at least 1 month of HBV antiviral medication in the prior year. Additionally, biannual liver imaging is recommended in this population to screen for the development of HCC. According to National HIV, Hepatitis and Related Conditions Data and Analysis Group personal correspondence, nationally, 51.2% of individuals with HBV cirrhosis had received at least one instance of liver imaging within the past 6 months, and 71.2% received imaging within the past 12 months.

Prevention of HBV Infection and Sequelae

Vaccination rates in the US vary by age group, with higher immunization rates among those born after 1991 than the rates of those born earlier. Data from the National Health and Nutrition Examination Survey from 1988 to 2012 reported 33% immunity among veterans aged < 50 years and 6% among those aged ≥ 50 years.²¹ In addition to individuals who received childhood vaccination in the 1990s, all new military recruits assigned to the Korean Peninsula were vaccinated for HBV as of 1986, and those



joining the military after 2002 received mandatory vaccination.

The VA follows the ACIP/CDC hepatitis B immunization guidelines.²²⁻²⁴ The VA currently recommends HBV immunization among previously unvaccinated adults at increased risk of contracting HBV infection and for any other adult who is seeking protection from HBV infection. The VA also offers general recommendations for prevention of transmission between veterans with known chronic HBV to their household, sexual, or drug-using partners. Transmission prevention guidelines also provide recommendations for vaccination of pregnant women with HBV risk factors and women at risk for HBV infection during pregnancy.²²

HBV CARE GUIDANCE

One of the core tasks of the VA National Hepatitis B Working Group, given its broad, multidisciplinary expertise in HBV, was developing general clinical guidelines for the provision of high-quality care for patients with HBV. The group reviewed current literature and scientific evidence on care for patients with HBV. The working group relied heavily on the VA's national guidelines for HBV screening and immunization, which are based on recommendations from the USPSTF, ACIP, CDC, and professional societies. The professional society guidelines included the American Association for the Study of Liver Disease's Guidelines for Treatment of Chronic Hepatitis B, the American College of Gastroenterology's Practice Guidelines: Evaluation of Abnormal Liver Chemistries, the American Gastroenterological Association Institute's Guidelines for Prevention and Treatment of Hepatitis B Reactivation during Immunosuppressive Drug Therapy, and CDC's Guidelines for Screening Pregnant Women for HBV.^{19,22-27}

The working group identified areas for HBV quality improvement that were consistent with the VA and professional guidelines, specific and measurable using VA data, clinically relevant, feasible, and achievable in a defined time period. Areas for targeted improvement will include testing for HBV among high-risk patients, increasing antiviral treatment and HCC surveillance of veterans with HBV-related cirrhosis, decreasing progression of chronic HBV to cirrhosis, and expanding prevention measures, such as immunization among those at high risk for HBV and prevention of HBV reactivation.

At a national level, development of specific and measurable quality of care indicators for HBV will aid in assessing gaps in care and developing strategies to address these gaps. A broader discussion of care for patients with HBV quality with front-line health care providers (HCPs)

will be paired with increased education and providing clinical support tools for those HCPs and facilities without access to specialty GI services.

Clinical pharmacists will be critical targets for the dissemination of guidance for HBV care paired with clinical informatics support tools and clinical educational opportunities. As of 2015, there were about 7,700 clinical pharmacists in the VHA and 3,200 had a scope of practice that included prescribing authority. As a result, 20% of HCV prescriptions in the VA in fiscal year 2015 were written by a clinical pharmacy specialist.²⁸ Since then, the VA has expanded the education and support of clinical pharmacists in the care of patients with HCV and advanced liver disease, making them uniquely suited to provide additional support for a complex, low-prevalence disease like HBV.

Identification and Monitoring

The HBV working group and the VA Viral Hepatitis Technical Advisory Group are working with field HCPs to develop several informatics tools to promote HBV case identification and quality monitoring. These groups identified several barriers to HBV case identification and monitoring. The following informatics tools are either available or in development to reduce these barriers:

1. A local clinical case registry of patients with HBV infection based on ICD codes, which allows users to create custom reports to identify, monitor, and track care;
2. Because of the risk of HBV reactivation in patients with chronic HBV infection who receive anti-CD20 agents, such as rituximab, a medication order check to improve HBV screening among veterans receiving anti-CD20 medication;
3. Validated patient reports based on laboratory diagnosis of HBV, drawn from all results across the VHA since 1999, made available to all facilities;
4. Interactive reports summarizing quality of care for patients with HBV infection, based on facility-level indicators in development by the national HBV working group, will be distributed and enable geographic comparison;
5. An HBV immunization clinical reminder that will prompt frontline HCPs to test and vaccinate; and
6. An HBV clinical dashboard that will enable HCPs and facilities to identify all their HBV-positive veterans and track their care and outcomes over time.

Evaluating VA Care for Patients with HBV

As indicators of quality of HBV care are refined for VA patients and the health care delivery system,

guidance will be made broadly available to frontline HCPs and administrators. The HBV quality of care recommendations will be paired with a suite of clinical informatics tools and virtual educational trainings to ensure that VA HCPs and facilities can streamline care for patients with HBV infection as much as possible. Quality improvement will be measured nationally each year, and strategies to address persistent variability and gaps in care will be developed in collaboration with the VA SMEs, facilities, and HCPs.

CONCLUSION

Hepatitis B virus is at least as prevalent among veterans who are cared for at VA facilities as it is in the US civilian population. Although care for patients with HBV infection in the VA is similar to care for patients with HBV infection in the community, the VA recognizes areas for improved HBV prevention, testing, care, and treatment. The VA has begun a continuous quality improvement strategic plan to enhance the level of care for patients with HBV infection in VA care. Centralized coordination and communication of VA data combined with veteran- and field-centered policies and operational planning and execution will allow clinically relevant improvements in HBV diagnosis, treatment, and prevention among veterans served by VA.

Author disclosures

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Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of Federal Practitioner, Frontline Medical Communications Inc., the US Government, or any of its agencies.

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