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Letter to the Editor

The Role of Hepatitis B Virus Biomarkers for Diagnosing the Progression of Disease

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To the editor,

Hepatitis B virus (HBV) infection remains a global public health concern, with over 296 million chronic carriers worldwide and an estimated 820,000 deaths annually due to HBV-related complications such as cirrhosis and hepatocellular carcinoma (HCC). [1] While serological markers like hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) have long been used in diagnosis and monitoring, emerging research has revealed the value of novel biomarkers in assessing disease progression, predicting treatment response, and guiding personalized care strategies.

One promising biomarker is quantitative HBsAg (qHBsAg), which reflects the transcriptional activity of covalently closed circular DNA (cccDNA) and integrated HBV DNA. Studies indicate that qHBsAg levels correlate with stages of infection and can distinguish inactive carriers from active disease, offering better stratification of patients under surveillance. [2] Declining qHBsAg levels during treatment also signal successful viral suppression and are associated with seroconversion.

Another innovative marker is HBV core-related antigen (HBcrAg), a composite marker comprising HBcAg, HBeAg, and p22cr. HBcrAg is particularly valuable in nucleos(t)ide analogue (NA)-treated patients, where conventional viral load measurements may be suppressed to undetectable levels. It serves as a surrogate for intrahepatic cccDNA activity, thus offering insight into the residual replicative capacity of the virus. [3]

Circulating HBV RNA has recently gained attention as a non-invasive marker reflecting active transcription from cccDNA. Its presence and quantity can inform the likelihood of viral rebound after treatment cessation, thus providing a potential tool for deciding when therapy can be safely discontinued. [4]

Furthermore, host-derived biomarkers such as serum microRNAs and immune signatures are being explored for their predictive value in liver fibrosis progression and HCC development. For example, elevated miR-122 levels have been linked to hepatic injury, while specific immune profiles may distinguish between immune-tolerant and immune-active phases of HBV infection. [5]

The integration of these novel biomarkers into clinical practice remains challenging due to variability in standardization, accessibility, and cost. However, their combined use

with traditional serologic markers offers a more nuanced understanding of HBV dynamics and disease staging.

In conclusion, HBV biomarkers such as qHBsAg, HBcrAg, HBV RNA, and host microRNAs are reshaping the landscape of chronic HBV management. Their incorporation into clinical algorithms could enhance personalized care, especially in distinguishing patients at risk for progression and tailoring antiviral strategies accordingly.

AUTHORS' CONTRIBUTION

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