Toward Personalized Therapy of Chronic Hepatitis B

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Hepatitis B virus (HBV) infection is a global health problem. Currently, we have two main antiviral treatment options: peginterferon (PEG-IFN)-alfa, and nucleoside/nucleotide analogues (NUC). Using PEG-IFN or potent NUC such as tenofovir and entecavir, the improvement of long-term outcomes in patients with chronic active hepatitis B has been demonstrated in recent nationwide treatment cohort studies from Taiwan and Hong Kong.

Peginterferon αlfa (PEG-IFN), which includes PEG-IFN αlfa-2a (Pegasys) and PEG-IFN α-2b (Peg-Intron), can be used to treat patients with chronic hepatitis B (CHB). A finite duration of PEG-IFN therapy may lead to long-term viral suppression. Clinically, it is important to identify super-responders and null-responders to PEG-IFN to avoid substantial adverse effects.

From the literature review, it is known that PEG-IFN is more effective for hepatitis B e antigen (HBeAg)-positive patients who have high pre-treatment alanine aminotransferase level, lower HBV DNA level and genotype A (vs genotype D) or genotype B (vs genotype C), as well as those with more favourable viral genomic background, such as precore stop codon or basal core promoter mutants infections in Asian patients and wild-type virus in Caucasian patients. For HBeAg-positive patients and HBeAg-negative patients with genotype D infection, PEG-IFN therapy could be terminated early at week 12 or 24 in primary non-responders if the on-treatment HBsAg decline is not satisfactory. With regard to host factors, single nucleotide polymorphisms of IL28B do not seem to affect the treatment outcomes in Asian patients, but its role in Caucasian patients remains disputed.

As for NUC-based therapy, similarly several host and viral factors have been identified to influence the treatment response and post-treatment relapse. Particularly, baseline and on-treatment viral load and baseline/on-treatment/end-of-treatment HBsAg levels have been found to correlate with the response and durability of NUC-based therapy.

Overall, most of the identified predictors need validation by large prospective trials. In addition, we need to identify more baseline predictors for super-responders in order to achieve personalised treatment for CHB.