Validation of CAGE-B and SAGE-B score for Asian patients with B-viral infection by antiviral therapy

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Background/Aims: Researchers recently developed scoring systems to determine risk of hepatocellular carcinoma (HCC) among Caucasians patients with chronic hepatitis B virus (HBV) undergoing antiviral therapy, i.e. CAGE-B and SAGE-B scores. We aimed to validate such scoring systems and compared their performance with that of other risk assessment models among an independent cohort from Asia.

Methods: We followed a total of 1,763 CHB patients with well-controlled HBV infection by antiviral therapy in the Republic of Korea. Cumulative probability of HCC development was evaluated by the Kaplan-Meier method with a comparison by log-rank test. We evaluated the ability of the CAGE-B and SAGE-B scores in comparison with other HCC prediction models, using integrated area under the curve (iAUC) analysis.

Results: During the follow-up (median 80.6 months), 163 patients (9.2%) developed HCC. Compared to low-risk (score 0~5) group by CAGE-B score with cumulative HCC risk at 7 years of 1.8%, the intermediate-risk (score 6~10) group with that of 7.8% and the high-risk (score 11~16) group with that of 35.0% are more likely to have HCC (Figure 1A, all p<0.001 betweeen each pair). Likewise, compared to low-risk (score 0~5) group by SAGE-B score with cumulative HCC risk at 7 years of 2.2%, the intermediate-risk (score 6~10) group with that of 8.4% and the high-risk (score 11~15) group with that of 49.2% are more likely to have HCC (Figure 1B, all p<0.001 betweeen each pair). CAGE-B and SAGE-B scores identified patients who developed HCC with an iAUC of 0.820 and 0.804, whereas CAMD, PAGE-B, mPAGE-B, and mREACH-B scores did with iAUCs of 0.786, 0.721, 0.748, and 0.800, respectively. The predicted and observed probabilities of HCC by both CAGE-B and SAGE-B scores showed excellent agreement.

Conclusions: We validated the CAGE-B and SAGE-B scores in determining risk of HCC in patients with chronic HBV infection receiving antiviral therapy. Validation was performed in a cohort of patients in the Republic of Korea, where most patients have genotype C2 HBV infection.

Figure 1. Cumulative probability of HCC development according to CAGE-B and SAGE B scores

Figure 1A. CAGE-B

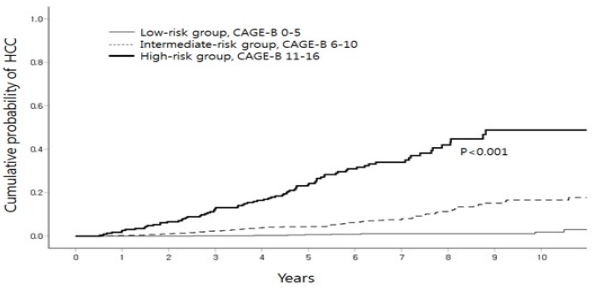

Figure 1B. SAGE-B