中文題目：基於血清生物標記的人工智能可預測 lenvatinib 在不可手術切除之肝細胞癌之治療效果

英文題目：Artificial intelligence based on serum biomarkers predicts the efficacy of lenvatinib for unresectable hepatocellular carcinoma

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Background

Lenvatinib has been effective as the first line systemic therapy for unresectable hepatocellular carcinoma (uHCC). We aimed to investigate the impact of serum biomarkers on the treatment outcomes of patients with uHCC treated with lenvatinib in a real-world setting using an artificial intelligence algorithm.

Methods

Serum biomarkers, including alpha-fetoprotein (AFP), albumin-bilirubin (ALBI) grade, and circulating angiogenic factors (CAFs [i.e., vascular endothelial growth factor [VEGF], angiopoietin-2 [ANG2], fibroblast growth factor-19 [FGF19], and FGF21]), were measured. Treatment outcomes, including objective response rate (ORR), progression-free survival (PFS), and overall survival (OS), were analyzed in patients with uHCC treated with lenvatinib.

Results

Of 82 patients with uHCC treated with lenvatinib, the median OS and PFS were 12.8 months and 5.3 months, respectively. Of 74 patients with assessable tumor responses, the ORR was 24.3%. An AFP reduction ≥ 40% from baseline within 8 weeks after lenvatinib induction was associated with a higher ORR. With baseline biomarkers using a decision tree-based model, we identified patients with high, intermediate, and low ORRs (84.6%, 21.7% and 0%, respectively; odds ratio, 53.04, $p<0.001$, high versus intermediate/low groups). The relative importance of the tumor response predictors was assessed by the random forest algorithm. Baseline FGF21 was identified as the most important predictor of tumor response, followed by ANG2, AFP, FGF19, and VEGF. Based on the decision tree-based survival predictive model, baseline AFP was the most important factor for OS, followed by ALBI grade and FGF21.

Conclusions

Baseline CAFs and early AFP decline were associated with a higher ORR, while the baseline levels of FGF21, AFP, and ALBI grade were factors predictive of longer OS with lenvatinib by decision tree-based models.