**Supplementary Materials**

**Table S1.** Differences in the rates of HCC diagnosis between AFP and PVIKA-II.

| | | AFP | | Total |
|---|---|---|---|---|
| | | Positive | Negative | |
| PVIKA-II | Positive | 197 | 100 | 297 (84.37%) |
| | Negative | 30 | 25 | 55 (15.63%) |
| Total | | 227 (64.49%) | 125 (35.51%) | 352 |

**Table S2.** Characteristics of the patients in the training cohort and validation cohort.

| Parameters | Training cohort (n=142) | Validation cohort (n=99) | *P* value |
|---|---|---|---|
| Age (years) Median (IQR) | 54.0(48.0-64.0) | 55.0 (47.0-63.5) | 0.936[a] |
| Gender Male (%) | 122 (85.9%) | 88 (88.9%) | 0.498[b] |
| Child-Pugh grade | | | 0.401[b] |
| A | 114 (80.3%) | 75 (75.8%) | |
| B | 28 (19.7%) | 24 (24.2%) | |
| BCLC | | | 0.499[b] |
| A | 29 (20.4%) | 16 (16.2%) | |
| B | 74 (52.1%) | 59 (59.6%) | |
| C | 39 (27.5%) | 24 (24.2%) | |
| AFP (mg/mL) Median (IQR) | 49.5 (5.7-1090.9) | 134.050 (14.5-2814.0) | 0.341[a] |
| PVIKA-II (mAU/mL) Median (IQR) | 486.8 (64.3-3442.3) | 818.1 (93.4-5834.1) | 0.174[a] |
| CEA (mg/mL) Median (IQR) | 2.4 (1.6-3.9) | 2.875 (1.433-4.327) | 0.454[a] |
| CA199 (mg/mL) Median (IQR) | 8.5 (5.0-19.1) | 10.8 (4.2-18.7) | 0.997[a] |
| WBC ($\times 10^9$/L) Median (IQR) | 7.610(5.140-10.170) | 7.7 (5.5-9.5) | 0.858[a] |
| LY ($\times 10^9$/L) Median (IQR) | 1.1 (0.7-1.6) | 1.1 (0.7-1.6) | 0.752[a] |
| NET ($\times 10^9$/L) Median (IQR) | 5.1 (3.1-7.9) | 4.8 (3.4-7.9) | 0.928[a] |

| | | | |
|---|---|---|---|
| NLR Median (IQR) | 4.5 (2.8-8.0) | 4.6 (2.6-9.1) | 0.664[a] |
| RBC (×10$^9$/L) Median (IQR) | 4.1 (3.4-4.5) | 4.0 (3.4-4.4) | 0.284[a] |
| Hb (g/L) Median (IQR) | 132.5 (122.3-144.0) | 126.0 (110.0-143.0) | 0.081[a] |
| RDW (%) Median (IQR) | 14.0 (13.0-15.0) | 13.0 (12.2-15.0) | 0.287[a] |
| PLT (×10$^9$/L) Median (IQR) | 165.0 (101.0-223.0) | 166.0 (108.0-223.5) | 0.954[a] |
| MPV (fL) Median (IQR) | 10.0 (9.1-10.9) | 10.0 (9.3-11.0) | 0.519[a] |
| ALT (U/L) Median (IQR) | 41.0 (23.2-63.0) | 42.0 (30.0-78.0) | 0.193[a] |
| AST (U/L) Median (IQR) | 45.0 (30.2-71.0) | 48.0 (37.0-96.5) | 0.099[a] |
| GGT Median (IQR) | 76.0 (49.8-146.3) | 87.5 (46.3-218.8) | 0.396[a] |
| LDH Median (IQR) | 232.5 (198.5-311.0) | 239.5 (198.0-322.8) | 0.982[a] |
| TBIL (μmol/L) Median (IQR) | 18.3 (13.7-24.8) | 19.0 (12.5-28.7) | 0.953[a] |
| DBIL (μmol/L) Median (IQR) | 4.4 (2.8-8.2) | 4.2 (2.9-8.8) | 0.895[a] |
| ALB (g/L) Median (IQR) | 36.8 (33.4-40.2) | 36.0 (32.3-40.1) | 0.374[a] |
| TP (g/L) Median (IQR) | 67.5 (62.7-71.4) | 65.0 (59.7-71.3) | 0.080[a] |
| Cr (μmol/L) Median (IQR) | 68.0 (56.3-77.0) | 70.0 (59.8-85.5) | 0.112[a] |
| PT (s) Median (IQR) | 12.5 (11.7-13.5) | 12.7 (12.0-14.3) | 0.007[a] |
| APTT (s) Median (IQR) | 30.1 (27.2-35.3) | 29.2 (27.2-33.0) | 0.120[a] |
| TT (s) Median (IQR) | 18.1 (17.2-19.1) | 17.9 (17.2-19.1) | 0.316[a] |
| FIB (g/L) Median (IQR) | 2.7 (2.1-3.6) | 2.9 (2.1-3.5) | 0.705[a] |

Categorical and continuous variables are presented as frequencies or medians (IQR), respectively. Differences between groups in categorical and continuous variables are analyzed using the chi-squared test and Mann-Whitney U test, respectively.

BCLC: Barcelona Clinic Liver Cancer; HBsAg: HBV surface antigen; CEA: Carcinoembryonic antigen; CA199: Carbohydrate antigen 199; LY: Lymphocyte; NET: Neutrophils; NLR: Neutrophil-to-lymphocyte ratio; RDW: Red cell distribution width; MPV: Mean Platelet Volume; Cr: Creatinine; TBIL: Total bilirubin; DBIL: Direct bilirubin; INR: International Normalized Ratio; APTT: Activated

partial thromboplastin time; TT: Thrombin time; FIB: Fibrinogen.
[a] Wilcoxon rank sum test; [b] Chi-squared test.