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Utility of AFP, PIVKA-II and GAAD score in Hepatocellular Carcinoma Surveillance.

Wei-Lun Liou[1], Si-Yu Tan[2], Wai-Yoong Ng[1], Kaina Chen[1], Jason Pik-Eu Chang[1], Thinesh Lee Krishnamoorthy[1], Chin-Pin Yeo[2], Chee-Kiat Tan[1]

1. Department of Gastroenterology & Hepatology, Singapore General Hospital, Singapore.
2. Department of Clinical Pathology, Singapore General Hospital, Singapore.

BACKGROUND & OBJECTIVES

- Hepatocellular carcinoma (HCC) is the third leading cause of cancer-related mortality worldwide.
- Semi-annual HCC surveillance with alpha-fetoprotein (AFP) and liver ultrasound is recommended to detect early-stage HCC.
- Protein induced by vitamin K absence or antagonist-II (also known as des-γ- carboxy prothrombin, DCP), a novel HCC biomarker, and algorithm risk scoring for HCC have not been well studied in the setting of HCC surveillance.
- We study the usefulness of adding PIVKA-II and gender-age-AFP-DCP (GAAD) score in detecting HCC in our at-risk populations undergoing HCC surveillance.

METHODS

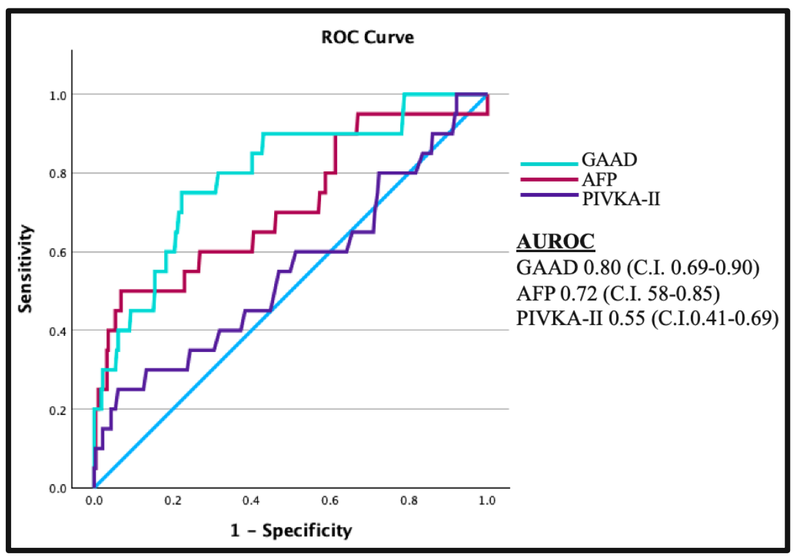
- Patient undergoing HCC surveillance in Singapore General Hospital were recruited between December 2017 and October 2018.
- Study serum specimen were collected at the time of surveillance imaging together with routine blood tests for up to 3 visits.
- The serum specimens were tested using Roche Elecsys® PIVKA-II and Elecsys® AFP assays.
- GAAD score was calculated by the in vitro diagnostic multivariate index assay incorporating patient's age, gender, AFP, and PIVKA-II.
- Cut-offs for AFP, PIVKA-II and GAAD score were 7.1ng/ml, 28.5ng/ml and 2.57, respectively.

RESULTS

- There were 299 patients; 176(58.9%) were males.
- Median age was 58 years (IQR 15).
- Chronic hepatitis B was the underlying aetiology in 270 (90.3%) patients.
- Median duration of follow up was 48.6 months.
- By February 2023, 20 patients had developed HCC.
- Median time between the last serum specimen and HCC was 20.5 months.
- The combination of AFP and PIVKA-II had the highest sensitivity for HCC detection.

	Sensitivity, %	Specificity, %
AFP	40.0	96.1
PIVKA-II	15.0	97.5
AFP & PIVKA-II	50.0	93.9
GAAD score	25.0	98.2

- Conversely, ROC analysis showed that GAAD outperformed both AFP and PIVKA-II for HCC detection.



CONCLUSIONS

- The addition of PIVKA-II to AFP was associated with improvement in biomarker sensitivity for HCC detection.
- In our cohort, GAAD outperformed both AFP and PIVKA-II in terms of AUROC but at the selected cut-offs, GAAD score was less sensitive than the combination of AFP and PIVKA-II.
- The performance of GAAD should be re-examined in a larger scale study and with assays done nearer to the time of HCC diagnosis.