A noninvasive serologic model using an intelligent informatic solution to enhance clinical decision-making and improve patient safety

The Second Norman Bethune Hospital of Jilin University Changchun, Jilin Province, China

KEY PARTNERS / STAKEHOLDERS

Yinlong Zhao | Zhenjing Jin | Yongsheng Yang | Chunmei Hu | Yan Zhao

Primary liver cancer (Hepatocellular carcinoma or HCC) is the fourth most common malignant tumor in China, with a 5-year survival rate of only 12.1%[1]. To improve overall survival rates for patients with HCC, early identification and diagnosis of groups at high-risk for HCC is key. Ideally, diagnosis of early HCC allows more patients to receive potentially curative treatments, such as lobectomy, interventional therapy, and liver transplantation, to maximize patient outcomes and ultimately reduce mortality associated with liver cancer. Regular surveillance of patients with chronic liver disease to identify high-risk groups and subsequent application of imaging tests to identify early HCC and/or precancerous lesions are effective means of detecting potential liver cancer.

Ultrasound is currently recognized as one of the most important screening methods for identification of early-stage liver cancer. However, ultrasound limitations for the diagnosis of liver cancer are easily affected by the skill level of the ultrasound operator[2,3]. Additionally, patients with nodular cirrhosis are prone to misdiagnosis or even a missed diagnosis. Serum biomarkers, such as alpha-fetoprotein (AFP), are commonly used to help alleviate some of the limitations of ultrasound. Unfortunately, AFP detection is limited in its ability to diagnose liver cancer, as more than 30% of patients with liver cancer have normal or only mildly elevated AFP levels, especially in patients with early or small liver cancer[4]. Thus, significant opportunities exist to ensure patient safety through routine and effective use of clinical risk models which are also recommended by the latest clinical guidelines.

The ASAP model is a risk stratification model based on serological tests and demographics (age, sex, AFP, and PIVKA-II). The model was validated in a large, multi-center Chinese cohort study in 2019, and is a convenient, relatively noninvasive, operable, and easily available tool that has been shown to accurately predict the presence of HCC. An integrated clinical care team at The Second Norman Bethune Hospital of Jilin University recognized an opportunity to provide education on and implement the ASAP into clinical care for the detection of liver cancer. A new diagnostic pathway based on intelligent informatic solution was developed to improve patient safety and reduce unnecessary invasive examinations, thereby maximizing the diagnosis and treatment effect of patients, reducing the cost of diagnosis and treatment, and improving patient prognosis.

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1. Zheng R, Qu C, Zhang S, et al. Liver cancer incidence and mortality in China: Temporal trends and projections to 2030. Chin J Cancer Res. 2018;30(6):571-579.
2. Tzartzeva K, Obi J, Rich N E, et al. Surveillance imaging and alpha fetoprotein for early detection of hepatocellular carcinoma in patients with cirrhosis: a meta-analysis[J]. Gastroenterology, 2018, 154(6): 1706-1718. e1.
3. Ayoub W S, Steggerda J, Yang J D, et al. Current status of hepatocellular carcinoma detection: screening strategies and novel biomarkers[J]. Therapeutic Advances in Medical Oncology, 2019, 11: 1758835919869120.
4. Luo P, Wu S, Yu Y, et al. Current status and perspective biomarkers in AFP negative HCC: towards screening for and diagnosing hepatocellular carcinoma at an earlier stage[J]. Pathology & Oncology Research, 2020, 26(2): 599-603