innovación tecnológica para laboratorio Rafer

Wako Wako Diagnostics

Increase your chances of detecting HCC earlier

With the Use of Risk Biomarkers for Hepatocellular Carcinoma

The biomarkers lectin-reactive alpha-fetoprotein (AFP-L3) and des-gamma-carboxy prothrombin (DCP) have been shown to be specific to hepatocellular carcinoma (HCC) and their combined use aids in clinical assessment for risk of HCC development. Adding the two risk biomarkers, AFP-L3 and DCP, to your current HCC surveillance practice can increase your chances of detecting HCC earlier. These tests are available now in the United States and Canada.

HCC SURVEILLANCE IMPROVES PATIENT OUTCOME

Early detection of HCC is crucial for the application of curative therapies and improving patient outcome. Since the underlying cause of HCC is usually identifiable, patients who are at-risk for development of liver cancer are highly encouraged to enroll in HCC surveillance programs for early detection of HCC [1]. A 2008 HCC surveillance study conducted in the USA concluded that the application of even a modest surveillance program for patients with cirrhosis can identify patients with early-stage HCC. In turn, HCC surveillance improves long-term, tumor-free survival of HCC patients receiving early treatment [2]. HCC management guidelines from the American Association for the Study of Liver Diseases recommend that patients be surveilled at 6 month intervals [3].

HOW TO USE AFP-L3 AND DCP AS RISK BIOMARKERS?

Both AFP-L3 and DCP tests are intended for in vitro diagnostic use as aids in the risk assessment of patients with chronic liver disease for development of HCC in conjunction with other laboratory findings, imaging studies and clinical assessment. Patients with elevated values for AFP-L3 (≥ 10%) and/or DCP (≥ 7.5 ng/mL) have been shown to have a 7 and/or 5-fold increased risk, respectively of developing HCC and should be more intensely evaluated for evidence of HCC. For more details, contact Wako Diagnostics to request copies of the package inserts for μTASWako® AFP-L3 and DCP.

HOW TO ORDER AFP-L3 AND DCP?

The tests AFP-L3 and DCP are available at major US reference laboratories. These tests can be ordered separately or in combination as a panel.

WHAT IS AFP-L3?

AFP-L3 is an isoform of AFP, which is a glycoprotein normally produced by fetal liver. In adults, an increase in the concentration of AFP can be indicative of primary liver cancer and germ cell tumors. AFP-L3 has been reported to be more specific to HCC development than other AFP isoforms [4]. The AFP-L3 isoform contains an extra fucose molecule and thereby can be separated from the other isoforms by using its unique binding affinity to the lectin, Lens culinaris agglutinin. An increase in the percentage of AFP-L3 relative to total AFP is associated with an increased risk of HCC development [5]. AFP-L3 (%) = [AFP-L3 concentration (ng/mL)/total AFP concentration (ng/mL)] * 100

WHAT IS DCP?

DCP is an abnormal form of the coagulation protein, prothrombin. In normal liver, the prothrombin precursor undergoes post-translational carboxylation before being released into the peripheral blood as prothrombin. The prothrombin production process is altered in HCC cells, leading to an accumulation of incompletely carboxylated prothrombin (DCP). An increase in DCP can thus be indicative of the presence of HCC cells, making it a useful biomarker for risk assessment and early detection [6]. DCP is also known as Protein Induced by Vitamin K Absence or Antagonist-II (PIVKA-II).

BIOMARKER ELEVATIONS BEFORE DIAGNOSIS

Biomarkers AFP-L3 and DCP have both been reported to be elevated before diagnosis of HCC by advanced imaging modalities [7,8] (Figure 1). HCC, however, does not always develop nor progress the same for every patient. As such it is expected that not all patients will express the biomarkers in the same way. Some patients have an early AFP-L3 elevation, some have DCP and some have both. Therefore, simultaneous measurements of AFP-L3 and DCP can help to improve risk assessment of HCC development. These biomarkers if used with surveillance can help identify patients with a higher risk of developing HCC and should be used to help guide the use of imaging.

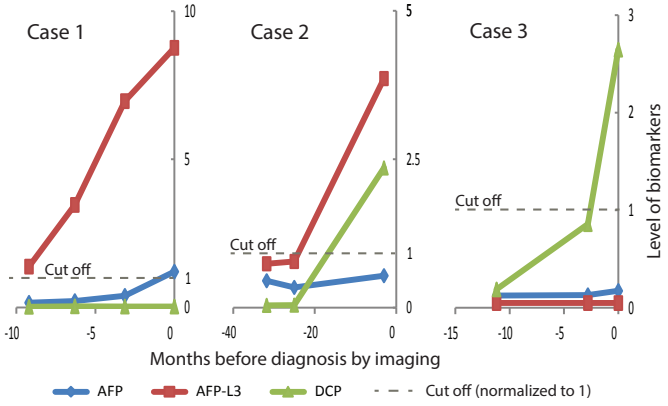

Figure 1: Elevation of AFP, AFP-L3, and DCP biomarkers before HCC diagnosis by advanced imaging modalities [7]
Cutoff levels were set for each biomarker as: AFP 20 ng/mL, AFP-L3 10%, DCP 7.5 ng/mL. Case 1: Only AFP-L3 was elevated before HCC diagnosis by MRI. Case 2: AFP-L3 and DCP were increased before HCC detection in a patient who had a low AFP level. Case 3: Only DCP was elevated prior to diagnosis.

COMBINED USE OF AFP-L3 AND DCP

Several studies have shown that the clinical utility of HCC biomarkers is improved when using the biomarkers in combination for risk assessment and early detection of HCC [7-13]. Studies cited in the HCC management guideline of the Japan Society of Hepatology show the sensitivity of AFP-L3 or DCP individually to detect small tumors of less than 3 cm in diameter ranged from 22.2 to 42.9% while that of the combined use of AFP-L3 and DCP was 41.7-66.7% [8, 11,12]. The specificity of the combination assay reported in these studies ranged from 89.5 to 89.8%.

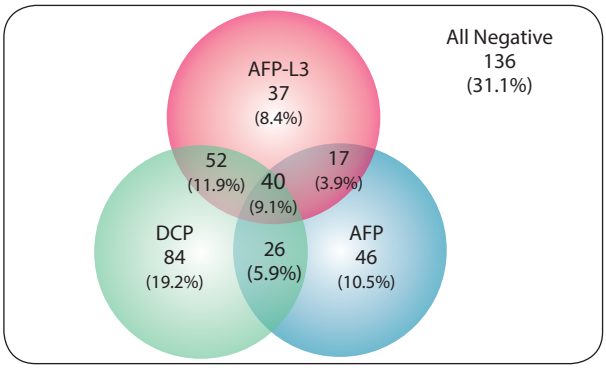

Figure 2 : HCC biomarkers are complementary
A study including 438 patients with known HCC shows various patterns of positivity for the biomarkers, highlighting the effectiveness of the combined use of the three biomarkers in HCC surveillance [13].

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