

Hubungan antara Temuan MRI Morfologi dan Fungsional dengan Kadar Serum Alpha Fetoprotein pada Karsinoma Sel Hati = Relationship between Morphological and Functional MRI Findings with Serum Alpha Fetoprotein Levels in Hepatocellular Carcinoma

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Abstrak

Latar belakang: Karsinoma sel hati (KSH) merupakan salah satu kanker dan penyebab kematian akibat kanker tersering. Magnetic resonance imaging (MRI) abdomen multifase adalah modalitas pilihan untuk diagnosis KSH, karena dapat menggambarkan perubahan patofisiologi selama hepatokarsinogenesis melalui sekuens dynamic contrast enhanced (DCE), T1-weighted imaging (T1WI) dengan chemical shift imaging, T2-weighted imaging (T2WI), diffusion-weighted imaging (DWI), peta apparent diffusion coefficient (ADC), serta fase hepatobilier. Alpha fetoprotein (AFP) sebagai penanda serologis KSH terkait surveilans, diagnostik, dan prognostik, juga berperan dalam hepatokarsinogenesis dengan menunjukkan perbedaan agresivitas tumor. Penelitian ini bertujuan menganalisis hubungan antara temuan morfologi dan karakteristik KSH pada MRI dengan kadar serum AFP.

Metode: Studi retrospektif ini dilakukan pada pasien KSH yang menjalani MRI abdomen multifase kontras spesifik hepatobilier dan kadar serum AFP di RSUPN dr. Cipto Mangunkusumo, serta belum menjalani prosedur pengobatan apapun. Dilakukan analisis menggunakan uji Chi Square atau uji Mutlak Fisher antara temuan morfologis dan karakteristik KSH pada MRI, serta menggunakan uji Mann-Whitney antara nilai rerata apparent diffusion coefficient (ADC) dengan kadar serum AFP.

Hasil: Diperoleh 82 subyek dengan usia rerata subyek 58 tahun, diameter tumor >5cm (58,5%) dan tumor multipel (59,8%) paling banyak ditemukan, serta memiliki perbedaan proporsi yang bermakna dengan kadar serum AFP (nilai $p = 0,030$ dan $p = 0,000$). Vaskularisasi tumor, kapsul tumor, lemak intratumoral, tumor hiperintens T2, restriksi difusi, dan tumor hipointens fase hepatobilier lebih banyak ditemukan pada kadar serum AFP 100ng/mL, namun tidak ditemukan perbedaan proporsi bermakna. Terdapat perbedaan bermakna nilai rerata ADC antara 39 subyek dengan kadar serum AFP < 100ng/mL dan 43 subyek dengan AFP \geq 100ng/mL. Median nilai rerata ADC 1,19 (0,71 – 2,20) pada subyek dengan kadar serum AFP < 100ng/mL, median 0,97 (0,72 – 1,77) pada subyek dengan AFP 100ng/mL, dan nilai $p = 0,003$.

Simpulan: Proporsi tumor berdiameter > 5cm dan tumor multipel pada subyek dengan AFP 100ng/mL secara bermakna lebih tinggi dibandingkan pada subyek dengan AFP < 100ng/mL. Nilai rerata ADC pada subyek dengan AFP 100ng/mL secara bermakna lebih rendah dibandingkan AFP < 100ng/mL. Sehingga nilai rerata ADC dapat membantu memprediksi kadar serum AFP pada pasien KSH.

.....Background: Hepatocellular carcinoma (HCC) is one of the most common cancers and cancer-related death. Multiphase contrast-enhanced abdominal magnetic resonance imaging (MRI) is the modality of choice for the diagnosis of KSH, as it can depict pathophysiologic changes during hepatocarcinogenesis through sequences: dynamic contrast enhanced (DCE), T1-weighted imaging (T1WI) with chemical shift imaging, T2-weighted imaging (T2WI), diffusion-weighted imaging (DWI), apparent diffusion coefficient (ADC) maps, and hepatobiliary phase. Alpha fetoprotein (AFP) as a serological marker of HCC related to surveillance, diagnostics, and prognostics, also plays a role in hepatocarcinogenesis by showing differences

in tumor aggressiveness. This study aims to analyze the relationship between morphological findings and characteristics of HCC on MRI with serum AFP levels.

Methods: This retrospective study was conducted on HCC patients who underwent hepatobiliary-specific contrast-enhanced multiphase abdominal MRI and serum AFP levels at Dr. Cipto Mangunkusumo Hospital, had not undergone any treatment procedures. Chi Square or Fisher's exact test between morphological findings and characteristics of HCC on MRI, and Mann-Whitney test between mean apparent diffusion coefficient (ADC) values and serum AFP levels were analyzed.

Results: There were 82 subjects with a mean age of 58 years, tumor size >5cm (58.5%) and multiple tumors (59.8%) were more common, had a significant difference in proportion with AFP serum levels (p value = 0.030 and p = 0.000). Tumor vascularization, tumor capsule, intratumoral fat, T2 hyperintense tumor, diffusion restriction, and hepatobiliary phase hypointense tumor were more common in serum AFP level 100ng/mL, but there was no significant difference in proportion. There was a significant difference in mean ADC between 39 subjects with serum AFP level < 100ng/mL and 43 subjects with AFP 100ng/mL. The median ADC score was 1.19 (0.71 – 2.20) in subjects with serum AFP level < 100ng/mL, median 0.97 (0.72 – 1.77) in subjects with AFP 100ng/mL, and p value is 0.003.

Conclusion: The proportion of tumors > 5cm in diameter and multiple tumors in subjects with AFP 100ng/mL was significantly higher than that in subjects with AFP < 100ng/mL. The mean value of ADC in subjects with AFP 100ng/mL was significantly lower than AFP < 100ng/mL. So that the mean value of ADC can help predict serum AFP levels in patients with HCC.