

## INTISARI

**Latar Belakang:** Karsinoma hepatoseluler (KHS) memiliki angka kematian tinggi di Indonesia, sebagian besar kasus disebabkan oleh hepatitis B kronis dan terdiagnosis pada stadium lanjut. *Transarterial chemoembolization* (TACE) menjadi terapi pilihan untuk pasien KHS stadium menengah, namun prosedur ini juga dapat menimbulkan toksisitas hati melalui iskemia dan nekrosis tumor. Rasio *aspartate aminotransferase* terhadap *alanine aminotransferase* (AST/ALT) dikenal sebagai penanda non invasif disfungsi hepatoseluler dan berpotensi digunakan dalam evaluasi awal pasien yang akan menjalani TACE. Namun, data terkait distribusi rasio AST/ALT dan kaitannya dengan karakteristik klinis pasien KHS di Indonesia masih terbatas.

**Tujuan:** Mengevaluasi profil rasio AST/ALT berdasarkan data demografis, klinis, dan hasil laboratorium pada pasien KHS yang akan menjalani TACE.

**Metode:** Penelitian deskriptif observasional dengan pendekatan potong lintang dilakukan di RSUP Dr. Sardjito pada Januari 2019–Juni 2023. Subjek adalah pasien KHS yang memenuhi kriteria inklusi. Data dikumpulkan meliputi karakteristik demografis, klinis, dan laboratorium. Rasio AST/ALT disajikan dalam bentuk median (rentang). Analisis statistik dilakukan menggunakan uji Mann–Whitney U dan Kruskal–Wallis. Nilai  $p < 0,05$  ditetapkan sebagai signifikansi statistik.

**Hasil:** Sebanyak 105 pasien dianalisis, didapatkan median rasio AST/ALT sebesar 1,82 (0,39–18,71); 42,9% memiliki rasio  $\geq 2$ . Rasio lebih tinggi ditemukan pada pasien dengan faktor risiko virus ( $p=0,013$ ), Child-Pugh B/C ( $p=0,004$ ), IMT normal dibanding obesitas I ( $p=0,018$ ), HBsAg reaktif ( $p=0,021$ ), albumin rendah ( $p=0,002$ ), bilirubin tinggi ( $p=0,002$ ), dan beban tumor melebihi batas *up-to-seven* ( $p=0,002$ ).

**Kesimpulan:** Rasio AST/ALT lebih tinggi pada pasien dengan faktor risiko infeksi virus hepatitis, skor Child-Pugh B atau C, IMT normal, HBsAg reaktif, kadar albumin yang rendah, kadar bilirubin total yang meningkat, serta beban tumor di luar batas kriteria *up-to-seven*.

**Kata kunci:** karsinoma hepatoseluler, *transarterial chemoembolization*, AST, ALT

## ABSTRACT

**Background:** Hepatocellular carcinoma (HCC) carries a high mortality rate in Indonesia, with the majority of cases attributed to chronic hepatitis B and diagnosed at advanced stages. Transarterial chemoembolization (TACE) is the preferred treatment for patients with intermediate-stage HCC; however, this procedure may also cause hepatotoxicity through ischemia and tumor necrosis. The aspartate aminotransferase to alanine aminotransferase (AST/ALT) ratio is a non-invasive marker of hepatocellular dysfunction and has potential utility in the initial evaluation of patients undergoing TACE. Nevertheless, data regarding the distribution of the AST/ALT ratio and its association with clinical characteristics of HCC patients in Indonesia remain limited.

**Objective:** To evaluate the profile of AST/ALT ratio based on demographic, clinical, and laboratory data in hepatocellular carcinoma patients scheduled to undergo transarterial chemoembolization (TACE).

**Method:** This study employed a descriptive observational design with a cross-sectional approach and was conducted at Dr. Sardjito General Hospital. The study subjects were patients with hepatocellular carcinoma (HCC) who were scheduled to undergo transarterial chemoembolization (TACE) between January 2019 and June 2023, with a total of 105 samples. An analysis of the AST/ALT ratio profile was performed based on demographic, clinical, and laboratory data. The AST/ALT ratio was presented as median and minimum–maximum range. The Mann–Whitney U test was used to compare the AST/ALT ratio based on age, sex, risk factor, diabetes mellitus status, cardiovascular disease, and tumor burden status according to the up-to-seven criteria. The Kruskal–Wallis test was used for analyses involving body mass index (BMI) and Child–Pugh score categories. A  $p$  value  $< 0.05$  was considered statistically significant.

**Result:** A total of 105 HCC patients fulfilled the inclusion and exclusion criteria. The median AST/ALT ratio was 1.82 (0.39–18.71), with 42.9% of patients having a ratio  $\geq 2$ . The median AST/ALT ratio was significantly higher in patients with viral hepatitis (2.12 vs. 1.71;  $p=0.013$ ). The AST/ALT ratio also increased with worsening liver function: median 1.71 (Child–Pugh A), 2.12 (Child–Pugh B), and 2.89 (Child–Pugh C) ( $p=0.004$ ). Higher ratios were also observed in patients with normal BMI compared to obesity I ( $p=0.018$ ), positive HBsAg ( $p=0.021$ ), hypoalbuminemia ( $p=0.002$ ), elevated total bilirubin ( $p=0.002$ ), and tumor burden beyond the up-to-seven criteria ( $p=0.002$ ).

**Conclusion:** The AST/ALT ratio is higher in HCC patients with viral hepatitis, Child–Pugh B or C scores, normal BMI, positive HBsAg, low albumin levels, elevated total bilirubin, and greater tumor burden.

**Keywords:** hepatocellular carcinoma, transarterial chemoembolization, AST, ALT