

The ALBI gradient after first transarterial chemoembolization is a predictive parameter for survival in patients with intermediate stage hepatocellular carcinoma

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Background and Aim

The prognosis of patients with hepatocellular carcinoma (HCC) is influenced by both the anatomic extent of cancer and liver reserve function. The Albumin-Bilirubin (ALBI) grade is a new index for liver function evaluation using only albumin and total bilirubin level. Its predictive role on outcome of HCC patients treated by RFA, surgical resection or sorafenib has been reported. However, the utility of ALBI in intermediate stage HCC patients undergoing TACE was uncertain. This study aimed to investigate the application of ALBI grade and dynamic change of ALBI grade (delta ALBI grade) after first TACE for prognosis prediction in HCC patients receiving TACE.

Methods

From January 2005 to December 2015, freshly diagnosed naïve HCC patients that were treated with TACE as the initial treatment at the Chang Gung Memorial Hospital, Linkou Medical Center were retrospectively recruited (Figure 1). The pre-treatment host factors, tumor status and noninvasive markers were collected. The Cox regression model was used to identify independent predictors of overall survival.

Results

Among 1568 treatment-naïve HCC patients, 34.1% patients were ALBI grade I and 65.9% were grade II/III at baseline. The median follow-up duration was 28.9 (IQR: 17.2-44.4) months. Complete remission after the first course of TACE occurred in 21.5% patients. During follow-up, 1052 patients died after repeated TACE that more than half due to liver failure (n= 553, 52.6%). By Cox regression analysis, advanced tumor stage (BCLC stage B: aHR: 1.148, p=0.049; BCLC stage C: aHR: 1.270, p=0.037), AFP > 400 (aHR: 1.550, p<0.001), ALBI grade II/III (aHR: 1.346, p<0.001), increased delta ALBI grade (aHR: 1.521, p< 0.001), and failed to achieve complete response after repeated TACE (aHR: 3.072, p < 0.001) were independent predictors for survival (Table 1) (Figure 2). With further stratification of different BCLC stages, ALBI grade was a significant predictor of overall survival only in BCLC-0/A (p < 0.001) while delta ALBI grade was a significant predictor of OS across all stages of BCLC patients (0/A: p=0.010, B: p = 0.030, C: p = 0.005). Comparing the sensitivity, specificity, PPV and NPV of survival between delta ALBI and changes of Child Pugh score (CPS), delta ALBI gradient is more simplified and non-inferior to CPS (ALBI: CPS: sensitivity 22.6% vs. 26.4%, specificity: 91.8% vs. 86.5%, PPV: 85.1% vs. 80.2%, and NPV: 36.3% vs. 36.1%).

Table 1. Predictors for post repeated TACE mortality

Variable	Crude HR (95%CI)	P value	Adjusted HR (95%CI)	P value
BCLC	O/A	Referent	Referent	
	B	1.333 (1.180-1.506)	1.148 (1.010-1.417)	0.049
	C	1.890 (1.661-2.151)	1.270 (1.015-1.590)	0.037
AFP	≤400	Referent	Referent	
	>400	1.788 (1.556-2.055)	1.550 (1.318-1.822)	<0.001
ALBI	I	Referent	Referent	
	II/III	1.239 (1.086-1.413)	1.346 (1.154-1.570)	<0.001
ALBI grade	No Δ	Referent	Referent	
	Δ	1.372 (1.166-1.614)	1.521 (1.277-1.811)	<0.001
Tumor extent	Unilobe	Referent	Referent	
	Bilobe	1.281 (1.134-1.446)	1.116 (0.966-1.289)	0.136
Final CR	Yes	Referent	Referent	
	No	3.240 (2.841-3.694)	3.072 (2.617-3.606)	<0.001

Figure 1. Flowchart of patients selection

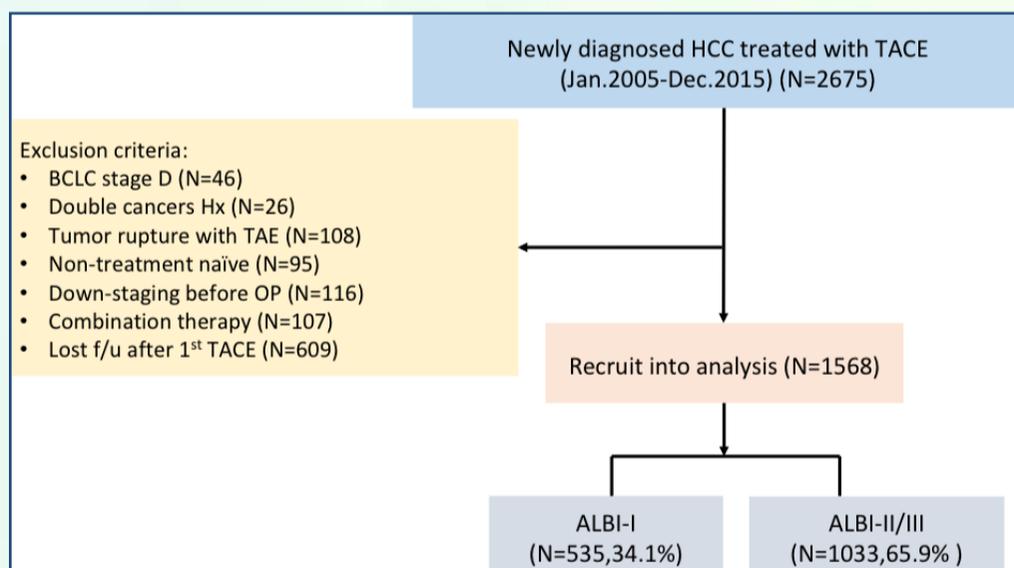
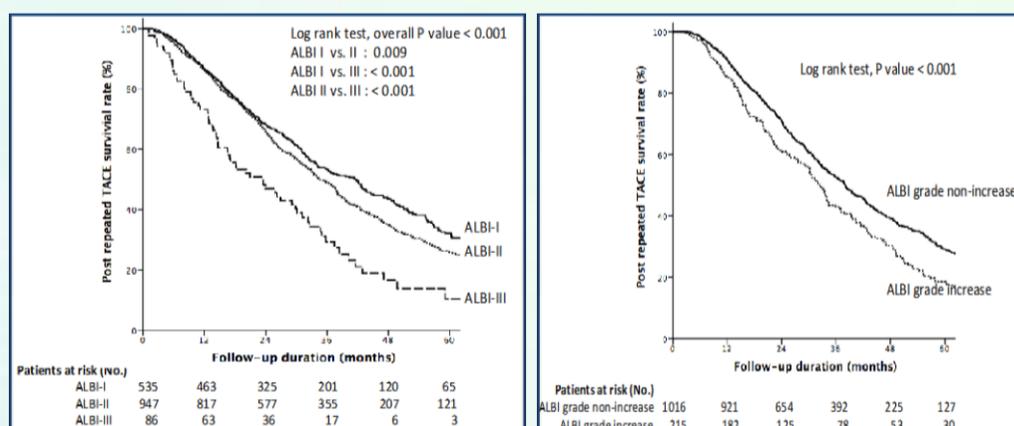


Figure 2. ALBI grade and delta ALBI grade are good predictors of overall survival in HCC patients



Conclusion

Delta ALBI grade is an independent predictor for survival and a useful marker, non-inferior to CPS, to predict survival of HCC patients receiving TACE.