Serological Risk Index Based on Alpha-Fetoprotein and C-Reactive Protein to Indicate Futile Liver Transplantation Among Patients with Advanced Hepatocellular Carcinoma

Digestive Diseases and Sciences

January 2019, Volume 64, Issue 1, pp 269–280 | Cite as

Original Article
First Online: 27 September 2018

Abstract

Background

The aim of this study was to establish a preoperatively available serological risk index using alpha-fetoprotein (AFP) and C-reactive protein (CRP) for predicting oncologically futile liver transplantation (LT) in hepatocellular carcinoma (HCC) patients.

Methods

A total of 119 liver transplant patients with HCC were retrospectively analyzed. The prognostic impact of clinical and histopathologic factors including pre-LT serum AFP and CRP values was determined.

Results

Apart from microvascular tumor invasion (MVI; odds ratio [OR] 15.77), pretransplant serum levels of AFP > 100 ng/ml (OR 13.31) and CRP > 0.8 mg/dl (OR 13.97) were identified as independent predictors of HCC recurrence. The cumulative risk of HCC relapse at 5 years post-LT was 2.3% in low serological tumor activity (STA) index (AFP ≤ 100 ng/ml + CRP ≤ 0.8 mg/dl), 17.1% in intermediate STA (AFP ≤ 100 ng/ml or CRP ≤ 0.8 mg/dl), and 91.6% in high STA index (AFP > 100 ng/ml + CRP > 0.8 mg/dl; $p < 0.001$), respectively. High STA index was identified as most powerful pre-LT available predictor of MVI (OR

15.31) and posttransplant HCC recurrence (OR 54.44). Five-year recurrence-free survival rate in Milan Out patients with high STA was 0%, compared to 91.7% and 83.6% in those with low or intermediate STA index ($p < 0.001$), respectively.

Conclusion

Our proposed serological risk index based on pretransplant serum AFP and CRP values is able to predict oncologically futile LT among advanced HCC patients.

Keywords

Alpha-fetoprotein C-reactive protein Hepatocellular carcinoma Liver transplantation Tumor recurrence Milan criteria

Abbreviations

AFP

Alpha-fetoprotein

AUC

Area under the curve

CI

Confidence interval

CRP

C-reactive protein

CT

Computed tomography

HCC

Hepatocellular carcinoma

IL

Interleukin

LT

Liver transplantation

LVI

Lymphovascular invasion

MC

Milan criteria

MELD

Model of end-stage liver disease

MRI

Magnetic resonance imaging

MVI

Microvascular invasion

OR

Odds ratio

OS

Overall survival

RFS

Recurrence-free survival

STA

Serological tumor activity

TACE

Transarterial chemotherapy

Notes

Compliance with ethical standards

Conflict of interest

The authors declare that there are no conflicts of interest related to the article.

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Cite this article as:

Kornberg, A., Schernhammer, M., Kornberg, J. et al. Dig Dis Sci (2019) 64: 269. https://doi.org/10.1007/s10620-018-5296-9

- Received 15 June 2018
- Accepted 17 September 2018
- First Online 27 September 2018
- DOI https://doi.org/10.1007/s10620-018-5296-9
- Publisher Name Springer US
- Print ISSN 0163-2116
- Online ISSN 1573-2568

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