Melatonin (MLT) has antioxidant, antifibrotic, and cytoprotective properties. Physical exercise (EX) has shown beneficial effects in different diseases.

To investigate the effects of MLT and EX on BDL-induced biliary cirrhosis in rats.

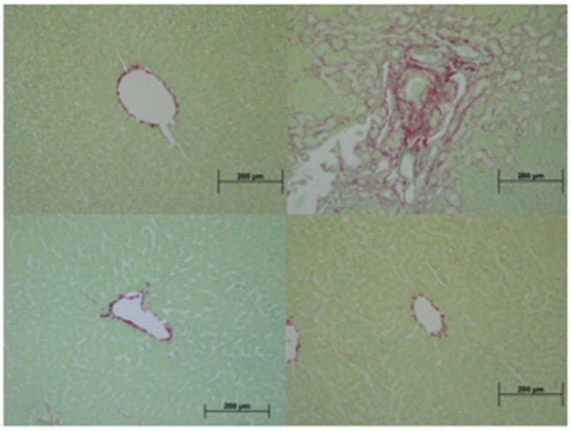
Materials and Methods: The study, was approved by CEUA/HCPA (2021-0642). We used 26 male Wistar rats (60 days, ±350g), distributed into four groups: CO, BDL, BDL+MLT, and BDL+EX. BDL was performed on day 1 in the experimental groups. From the 15th day onwards, MLT (20 mg/kg/day) was administered and the swimming protocol was started. On the 29th day, blood (for analysis of AST, ALT and FA) and liver were collected. Data were analyzed by One-Way ANOVA with Student-Newman-Keuls post-test (mean±SE; $p<0.05$).

Results: AST, ALT and FA were increased significantly in the LDB group vs. CO ($p<0.05$), with reduction in the LDB+MLT and LDB+EX groups ($p<0.05$). The Picrosirius staining indicated intense fibrosis in the LDB group, this effect was attenuated by treatments. GPx activity was reduced in the LDB group ($p<0.01$), but increased with MLT and EX. CAT increased in the LDB group and decreased with treatments ($p<0.05$). Nitric oxide levels increased in the LDB group and decreased with MLT.

Conclusions: MLT and EX promoted protective effects in the liver of rats with biliary cirrhosis, attenuating biochemical, oxidative and fibrotic changes.

Conflict of interest: None

Histological analysis of the liver (Picrosirius)



Picrossirius staining. Magnification 200X. CO: control, BDL: bile duct ligation group, BDL+MLT: BDL plus melatonin group and BDL+EX: BDL plus exercise group. BDL group presented portal fibrosis widening and ductular reaction. BDL+MLT and BDL+EX groups presented significant decrease in fibrosis.

https://doi.org/10.1016/j.aohep.2025.101973

#168

ARTIFICIAL INTELLIGENCE FOR SURVIVAL PREDICTION IN HEPATOCELLULAR CARCINOMA: DEVELOPMENT AND VALIDATION OF A CLINICAL DATA–DRIVEN MODEL IN A COHORT OF 129 PATIENTS

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Introduction and Objectives: To develop and validate a predictive survival model for patients with hepatocellular carcinoma (HCC) associated with metabolic dysfunction–associated steatotic liver disease (MASLD), using artificial intelligence applied to widely available clinical and laboratory data. Additionally, to compare the model's performance with traditional prognostic scores commonly used in HCC risk stratification.

Materials and Methods: This retrospective study included 129 patients with confirmed HCC and underlying MASLD. Clinical, laboratory, and tumor-related variables were analyzed, including metabolic comorbidities, liver function markers, tumor burden, cirrhosis-related complications, and established prognostic scores (Child-Pugh, FIB-4, and ALBI). The predictive model was built using Cox proportional hazards regression with L2 regularization to manage high-dimensional data and minimize overfitting. The XGBoost (Extreme Gradient Boosting) algorithm was implemented, with random allocation of the dataset into a training cohort (80%) and an internal validation cohort (20%). DeepSurv, a deep learning–based survival model, was also explored as a complementary strategy.

Results: The regularized Cox model demonstrated robust predictive performance, achieving a concordance index (C-index) of 0.774 in the validation cohort. The variables most strongly associated with reduced survival included tumor thrombosis (HR 8.27), hepatic encephalopathy (HR 4.66), and spontaneous bacterial peritonitis (HR 6.51), all statistically significant. The proposed model outperformed widely used prognostic scores such as BCLC, CLIP, and ALBI, showing superior discriminative ability for survival prediction in patients with HCC-MASLD.

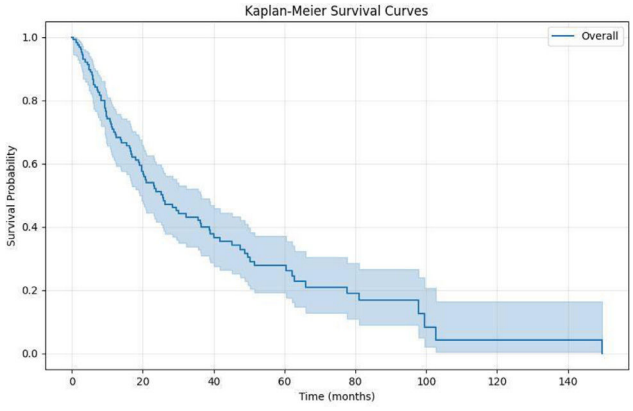
Conclusions: The AI-based model, built using easily accessible clinical and laboratory data, demonstrated superior performance in predicting survival in patients with HCC-MASLD. This approach enables more precise and scalable risk stratification, with direct applicability in real-world clinical practice.

Conflict of interest: None

Comparative Predictive Performance: Our Model Versus Traditional Prognostic Scores (C-index)

Model	Approach	C-index
Our Model	AI + Cox regression with L2 regularization	0.774
BCLC	Clinical staging	~0.60–0.68
CLIP	Clinical score	~0.62–0.70
ALBI	Objective liver function score	~0.65–0.70
HCC Risk	Continuous clinical variables	~0.72–0.74

Survival Curves in MASLD-Related HCC Based on AI-Identified Prognostic Variables



https://doi.org/10.1016/j.aohep.2025.101974