

Title : A Model Predicting Treatment Response to Transarterial Embolization in Ruptured Hepatocellular Carcinoma

Author(s) :	1. Ms. CAHANE PONGKITI	Student ID : 640510695
	2. Mr. PHITHAK WANGTO	Student ID : 640510702
	3. Ms. JARIYAPHON PUTKHAE	Student ID : 640510713
	4. Ms. JANJIRA PORAHA	Student ID : 640510714
	5. Ms. SUTHISA THARAPHAN	Student ID : 640510734

Major : Data Science

Advisor(s) : 1. Assistant Professor Dr. PAPANGKORN INKEAW

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ABSTRACT

Hepatocellular carcinoma (HCC) is a significant public health issue in Thailand, particularly when complications increase the risk of mortality if not promptly and appropriately treated. Currently, there are three treatment approaches for managing hemorrhage in HCC patients: Transarterial Embolization (TACE), Surgery, and Conservative Treatment. Therefore, the objective of this study is to develop a predictive model for estimating the survival time of HCC patients with hemorrhagic complications using clinical factors and laboratory test results. This study used data from patients with HCC and hemorrhage. Clinical and laboratory data were analyzed to develop a Regression model for estimating patient survival time. The data analysis process involved cleaning and handling missing values. Then, feature selection methods were performed to select significant variables influencing survival. The regression model was developed using K-Fold Cross-Validation to reduce bias in performance evaluation. The Logistic Regression Model predicts survival time for liver cancer patients, achieving a Root Mean Squared Error of 494.225 days and an R-squared of 0.541. The model identifies several key factors influencing survival, including treatment type (TACE or surgery), sex, liver cirrhosis severity, hematocrit levels, blood coagulation, blood protein levels, bilirubin levels, presence of ascites, and liver cancer stage. By analyzing these factors,

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the model estimates the probability of survival for individual patients and compares the predicted outcomes of TACE and surgery. This personalized approach aims to identify the most effective treatment option for each patient, ultimately contributing to improved survival outcomes in liver cancer. This study highlights the crucial role of predictive modeling in clinical decision-making by enabling physicians to tailor personalized treatment strategies to improve survival rates for HCC patients with hemorrhagic complications.

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