

## عنوان مقاله:

Investigating best predictor factors of circulatory shock in intensive care unit patients

## محل انتشار:

بیستمین کنگره پژوهشی سالیانه دانشجویان علوم پزشکی کشور (سال: 1398)

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## خلاصه مقاله:

Background: Circulatory shock is the condition that blood flow is insufficient in the whole body so that it causes body tissues injury. In this condition, the cardiovascular system including the heart, blood vessels wall, and the vasomotor system starts to deteriorate. Maybe circulatory shock becomes worse so at the beginning of shock procedure it is possible to cause massive injuries in different organs in a short time that it shows the importance of having a reliable system for predicting shock occurrence. The aim of this study is to find the best predictor factors and desiring a statistical model for predicting circulatory shock. Methods: The type of study is a cross-sectional analytic study. Seventy patient s clinical data (PCD) that were registered in the MIMIC-II database included in the study. Thirty PCD selected as a training data for learning the machine and 40 PCD selected for testing machine. Fifty percent of the training group experienced circulatory shock. Each PCD was the patient s systolic blood pressure, diastolic blood pressure, pulse pressure, mean atrial pressure, heart rate, respiration rate, and oxygen saturation from the beginning of hospitalization till 30 minutes before the incidence of circulatory shock or disconnecting the recorders. Features extracted from training data by using Genetic algorithm and also decision tree method has been used to make a statistical model for the features. Finally, features were sorted based on their ability to predict circulatory shock in the test group. Results: In the test group, 37.5% of patients experienced circulatory shock. Diastolic blood pressure median between 248-538 minute intervals was the best feature which was able to predict the incidence of circulatory shock in the test group with 80 percent sensitivity and 96 percent specificity also the best combination of features was able to predict with 86.67 percent sensitivity and 84 percent specificity. Conclusion: Using vital signs is helpful for predicting circulatory shock also processing ECG signals are recommended for further researches. Some of the optimal timespans contain data from even 10 hours before the T0 which suggests that while predicting circulatory shock it is important to consider using long-range timespans and data from past hours too.

## کلمات کلیدی:

circulatory shock, machine learning, decision tree, prediction, genetic algorithm

