Blood pressure management in acute ischemic stroke by machine learning techniques

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Raised blood pressure(BP) is related to mortality and disability in acute ischemic stroke patients, however, there is no evidence of outcomes improvement with hypertension treatment. Accordingly, permissive hypertension is recommended during the first 24-hours after stroke onset. This study aims to develop a decision support tool for improving BP management in the first 24-hours after acute ischemic stroke by using machine learning tools. MIMIC-III and eICU databases were used to identify 7265 acute ischemic stroke patients. Decision trees were constructed to predict successful BP lowering to an interval of 10-30 percent off the maximal value when antihypertensive treatment was given according to AHA/ASA guidelines. Diastolic blood pressure(DBP) is the main variable for predicting the probability of BP reduction in the first 24-hours after a stroke. When the DBP is above 120mmHg the most effective treatment is Lisinopril with a probability of 1 to reduce BP regardless of the systolic blood pressure(SBP) values. Labetalol lowers BP with a probability of 0.926 when the BP is above 200/120mmHg. When the DBP is below 120mmHg the effectiveness of treatment depends on the thrombolytic status. The results indicate that treatment choice should be adjusted to different BP parameters, thus providing a better decision-making approach.

Biography

Orit Mazza has completed her MD from Technion-Israel Institute of Technology and MBA in management information systems from Bar-Ilan University. She is physical medicine and rehabilitation resident in Loewenstein rehabilitation hospital. Her research interest is in the area of applications of data mining techniques in healthcare. Prof. Onn Shehory currently works at the Graduate School of Business Administration, Bar Ilan University. Onn researches Artificial Intelligence, Software Engineering, and Distributed Computing Nirit Lev is the head of the department of Neurology in Meir Medical Center. She completed her M.D, Ph..D. degrees from Tel-Aviv University.

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