Neural Network Model for Cortisol Regulation

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Abstract

Predictive modeling based on machine learning is essential for evaluating real-time medical data in order to identify cortisol spikes, which are markers of stress and adrenal function. Several physiological biomarkers, such as age, sex, albumin and creatinine levels, fasting and postprandial blood sugar levels, white blood cell (WBC) count, neutrophil-to-lymphocyte ratio (NLR), sodium and cholesterol levels, and cortisol spikes, are analyzed in this study using a Random Forest classifier to find patterns and correlations. To increase model accuracy, preprocessing methods including handling missing values and encoding categorical variables are applied to a dataset of 918 genuine patient records. The trained Random Forest model helps identify stress-related diseases and possible adrenal problems early on by reliably classifying cortisol spikes. By utilizing classification measures for performance evaluation, the model's efficacy is confirmed, showcasing its potential to enhance patient outcomes through data-driven decision-making, early diagnosis, and healthcare monitoring.

Keywords

Cortisol Spikes, Biomarkers Analysis, Stress Detection, Medical Data Analysis, Adrenal Function.