Mathematical Based Forecasting of Heart Attack

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Abstract : Myocardial infarction (MI) or acute myocardial infarction (AMI), commonly known as a heart attack, occurs when blood flow stops to part of the heart causing damage to the heart muscle. An ECG can often show evidence of a previous heart attack or one that's in progress. The patterns on the ECG may indicate which part of your heart has been damaged, as well as the extent of the damage. In chaos theory, the correlation dimension is a measure of the dimensionality of the space occupied by a set of random points, often referred to as a type of fractal dimension. In this research by considering ECG signal as a random walk we work on forecasting the oncoming heart attack by analyzing the ECG signals using the correlation dimension. In order to test the model a set of ECG signals for patients before and after heart attack was used and the strength of model for forecasting the behavior of these signals were checked. Results shows this methodology can forecast the ECG and accordingly heart attack with high accuracy.

Keywords : heart attack, ECG, random walk, correlation dimension, forecasting
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