基于二阶CO复杂度的癫痫发作预测

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　　癫痫发作的预测是近年来在临床医学和神经系统科学研究领域中备受关注的问题。如果癫痫发作能够被可靠地预测，则可以提前采取有效的临床预防措施，从而能较大程度地改善癫痫患者的生活质量。文章提出了一种基于二阶CO复杂度的预测算法用于预测癫痫发作。该算法通过分析癫痫患者颅内脑电信号的二阶CO复杂度，利用发作前期复杂度曲线的变化特征预测癫痫发作。作者运用该算法对21组癫痫病人87次发作的临床颅内脑电数据和4组大鼠4次发作的颅内脑电数据进行分析计算，预测准确率分别为94.3%和100%。实验结果表明该算法可以有效地预测癫痫发作，具有潜在的重要临床应用价值。

Prediction of Epileptic Seizures Based on Second-Order CO Complexity

　　Seizure prediction is a topic of great interest in the clinical and basic neuroscience communities. If we can successfully forecast the occurrence of epileptic seizures, clinical treatments such as electrical stimulation or focal drug can be given on demand. Then the quality of life of many epilepsy patients will be significantly improved. In the paper, a prediction algorithm based on the second-order CO complexity was proposed to predict epileptic seizures. The algorithm analyzed the second-order CO complexity of intracranial EEG recordings from epilepsy patients to forecast the occurrence of seizures automatically. Through the analysis and computation of intracranial EEG data from 21 epilepsy patients with 87 seizures and 4 epilepsy rats with 4 seizures, the results based on the proposed algorithm showed that the sensitivity of prediction was 94.3% and 100%, respectively. Experimental results indicate that the proposed scheme has a good performance in predicting epileptic seizures, and it should provide significant clinical efficacy.

关键词

　　脑电信号(EEG)；癫痫发作预测(Epileptic seizures prediction)；CO复杂度(CO complexity)；二阶CO复杂度(Second-order CO complexity)