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应用脑电近似熵分析观察失语症恢复过程的皮质电活动

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摘要：

目的：①研究应用脑电近似熵分析是否可以观察到与言语任务相关的两半球脑电变化；②动态观察语言治疗过程中言语改善与两侧大脑皮质电活动的联系。方法：利用脑电近似熵分析方法观察1例传导性失语症患者卒中后7周、9周、30周言语治疗过程中，安静闭眼、词复述、非词复述3种状态下的两侧大脑皮质电活动，同时进行言语评价。记录3种状态下1名健康者脑电图作为正常对照。结果：正常对照者言语任务下的脑电图与安静闭眼状态比较，词和非词复述T3、T5、C3、P3、O1导联，及非词复述F7、T6近似熵增高。患者第一次脑电近似熵分析显示，词复述P3、非词复述P4近似熵增高；伴有词复述F4的降低。第二次检查，词和非词复述F3、F7、P3、C3、C4、T3、T5、O1近似熵增高；伴有F8、T4、O2近似熵明显降低。第三次检查，词复述时左颞T3、P3、F7、O1、O2增高，非词复述T3、O2增高。第一次失语症评价显示，语义系统和声母听辨别轻度受损；命名和词复述严重受损。第二次与第一次比较，声母听辨别、听觉词-图匹配明显改善（P<0.05），复述未见改善。第三次与第二次脑电图检查比较，左半球近似熵增高的区域减少，同样比正常者激活区少。言语评价复述成绩显著提高；命名与语音输出词典的相关测验均显著改善。结论：应用脑电近似熵分析可以观察到传导性失语症恢复过程不同阶段皮质电活动的变化。

关键词：脑电图 近似熵 失语症 恢复

Observation of cortical electrical activation during aphasic recovery with EEG approximate entropy

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Fund Project:

Abstract:

Objective: ①To study whether changes of cortical electrical activations in two hemispheres correlated with speech tasks could be observed with approximate entropy analysis of EEG;②To dynamically observe the correlation of speech improvements with cortical electrical activations in two hemispheres during speech treatment. Method: Changes of cortical electrical activations were observed with EEG in a conductive aphasic 7、9 and 30 weeks after stroke. EEG was recorded in 3 different conditions: eyes closed, word repetition and non-word repetition. The EEG of a healthy man was recorded in 3 different conditions as control. Result: Compared with eye-closed condition, EEG approximate entropies(ApEns) of the healthy subject increased in T3, T5, C3, P3 and O1 for word and non-word repetition, and additional F7 and T6 for non-word repetition task. For the patient, ApEn of the first EEG increased in P3 for word repetition, and P4 for non-word repetition; ApEns of the second EEG increased in F3, F7, P3, C3, C4, T3, T5, O1, and decreased in F8, T4 and O2 in right hemisphere for word and non-word repetition; ApEns of the third EEG increased in T3, P3, F7, O1, O2 for word repetition, and T3, O2 for non-word repetition. The first aphasia assessment showed light impairment of semantic system and initial sound auditory identification and severely impairment of picture naming and word repetition. The semantic system and initial sound auditory identification improved significantly in the second assessment compared with the first; but the word repetition remained unchanged. The range of the activated regions in the left hemisphere decreased in the third EEG compared with the second EEG and the activated regions were less than the normal subject. Conclusion: The cortical electrical activities correlated with repetition tasks and the change of cortical electrical activities in different stages of language recovery could be observed with EEG nonlinear analysis.

Keywords:electroencephalograph approximate entropy aphasia recovery

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