Non-linear Analysis of Spontaneous EEG After Spinal Cord Injury: An Experimental Study

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Abstract : Spinal cord injury (SCI) brings great negative influence to the patients and society. Neurological loss in human after SCI is a major challenge in clinical. Instead, neural regeneration could have been seen in animals after SCI, and such regeneration could be retarded by blocking neural plasticity pathways, showing the importance of neural plasticity in functional recovery. Here we used sample entropy as an indicator of nonlinear dynamical in the brain to quantify plasticity changes in spontaneous EEG recordings of rats before and after SCI. The results showed that the entropy values were increased after the injury during the recovery in one week. The increasing tendency of sample entropy values is consistent with that of behavioral evaluation scores. It is indicated the potential application of sample entropy analysis for the evaluation of neural plasticity in spinal cord injury rat model.