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Association between epileptiform discharges and the sleep cycle in 200 epileptic patients

Lv Yu-Dan and **Hong-Mei Meng**
The First Affiliated Hospital of Jilin University, P. R. China

Objective: The poor sleep quality of epileptic patients may be partly due to the occurrence epileptiform discharges (EDs). It was observed the number of interictal discharges in each sleep stage and explored the associations between EDs and sleep phases in epileptic patients.

Methods: Two hundred epileptic patients and 182 healthy volunteers were enrolled in the current study. For all subjects, video electroencephalography (EEG) monitoring and 24-hr night polysomnography were conducted to detect EDs and analyze the sleep structures.

Results: EDs were detected in 91% of epileptic patients with the most frequent cases from the temporal lobe. The EDs detected during waking, sleeping, or both waking and non-rapid eye movement (NREM) sleep stages 1-2 accounted for 7.1%, 19.2%, and 25.3% of the total patients, respectively. EDs were rare during NREM stages 3-4 with 1.1% of total patients mainly in the central-temporal lobe. The total sleep time and time spent in REM were similar between the epileptic patients and healthy volunteers. However, epileptic patients spent a significantly longer mean sleep time in NREM stages 1-2 (293.91 ±27.57 min vs. 223.17±15.28; p=0.000) and less in NREM stages 3-4 (50.11±12.12 min vs. 133.96±10.77; p=0.000) than healthy volunteers. Furthermore, asymmetric sleep spindles and fragmentary sleep structure as well as high inversion frequency were found in 26.7% and 43.3% of epileptic patients, respectively.

Conclusion: Combination of long-term video EEG with polysomnography is a useful method to analyze associations between EDs and the sleep-wake cycle. This strategy can also help identify the nature of sleep disorders in epileptic patients, which may improve the treatment efficacy.

lvyudan@sina.com