

Original article

Approaches to staging sleep in polysomnographic studies with epileptic activity

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Abstract

Background: The Standardized Sleep Manual of Rechtschaffen and Kales is well established and reliable in scoring the majority of polysomnograms (PSGs) encountered in clinical practice. In patients with epilepsy, however, abnormal brain activity may confound the interpretation of sleep waveforms. Our goal is to identify features that are problematic in analyzing sleep stages in patients with epilepsy and to offer approaches to score these PSGs.

Methods: Ninety-eight PSGs from 43 patients with epilepsy were scored using Rechtschaffen and Kales guidelines. Features interfering with sleep staging were noted.

Results: In scoring polysomnograms (PSGs) of patients with epilepsy we noted epileptic seizures, interictal epileptiform discharges (IEDs) and abnormal EEG background to be features of epilepsy that compromised sleep scoring. Overall, 48% of the studies in our sample contained one or more of these epileptic features to the extent that sleep scoring by standard criteria was compromised. Approaches for staging sleep in the setting of these abnormalities are outlined.

Conclusions: The Rechtschaffen and Kales method of sleep scoring is useful in staging the majority of PSGs of patients with epilepsy. However, we advocate some modifications because the abnormal electrical activity of epilepsy may interfere with accurate scoring of sleep waveforms. These approaches to scoring PSGs of patients with epilepsy will require empirical testing.

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Keywords: Sleep scoring; Rechtschaffen and Kales; Epilepsy; Seizure; Interictal epileptiform discharge

1. Introduction

A relationship between sleep and epileptic activity has been noted and appreciated by scientists for centuries. Hippocrates and Aristotle made observations that seizures are associated with sleep or sleepiness in some patients [1,2]. Yet, over 2000 years later, scientists are still exploring interrelationships between epileptic seizures, sleep, and electroencephalographic (EEG) measures of brain activity. Polysomnography (PSGs) has been widely used to investigate this interrelationship [3–6].

Especially when combined with multiple EEG channels, PSGs are also a useful clinical diagnostic tool for physicians

in their treatment of patients with epilepsy. These studies may distinguish seizures from other sleep-related events, such as arousal disorders, and may diagnose sleep disorders co-existing with epilepsy. Other areas of research in epilepsy concern the influence of sleep state, circadian rhythms, and brain activity during individual stages of sleep on seizure initiation [7].

Increased study of sleep EEGs in patients with epilepsy has been facilitated by the progression from paper to digital recordings. Parameters that were ‘fixed’ on paper studies, such as the montage, filter settings, and paper speed can now be changed on the digital recording to customize analyses for both EEG and sleep. This technological advancement has resulted in the increased clinical and research use of sleep EEG and PSG studies. Despite these technical advances and the growing interest in the relation between sleep and epilepsy, there are no specific guidelines for staging sleep records where epilepsy is suspected or known

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The Top Books of the Year Sleep 1976 Memory Environment Epilepsy Sleep Staging The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels captivating the hearts of readers worldwide. Let's delve into the realm of bestselling books, exploring the fascinating narratives that have captivated audiences this year.

The Must-Read : Colleen Hoover's "It Ends with Us" This poignant tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover expertly weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can prevail.

Uncover the Best : Taylor Jenkins Reid's "The Seven Husbands of Evelyn Hugo" This spellbinding historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reid's captivating storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery.

Discover the Magic : Delia Owens' "Where the Crawdads Sing" This mesmerizing coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens spins a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting.

These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of captivating stories waiting to be discovered.

The novel begins with Richard Paffen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts.

The Secret History is a masterful and thrilling novel that will keep you speculating until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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