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Recent Updates in Sleep Disorders Related to Neurological Diseases

Essay

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المستجدات الحديثة في اضطرابات النوم المتعلقة باللأمراض العصبية

رسالة مقدمة
توطئة للحصول على درجة الماجستير
فى الأمراض النفسية والعصبية

مقدمة من

الطبيبة/نرمين كمال السيد حجي
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Nermin Kamal El-Sayed Higgy

Contents

List of Abbreviations

Abb.	Meaning
5HT	5-Hydroxy-tryptamine
ACTH	Adreno-cortico-trophic Hormone
ADP	Adenosine Di-phosphate
AEDs	Antiepileptic Drugs
AHI	Apnea-hypopnea Index
ARAS	Ascending Reticular Activating System
ASDA	American Sleep Disorders Association
ATP	Adenosine Tri-phosphate
AVP	Arginine Vasopressin
BDNF	Brain-Derived Neurotrophic Factor
CB	Cannabinoid Receptors
CCK	Cholecystokinin
CH	Cluster Headache
CMH	Chronic Morning Headache
CPAP	Continuous Positive Airway Pressure
CPH	Chronic Paroxysmal Hemicrania
CRH	Corticotrophin Releasing Hormone
CSA	Central Sleep Apnea
CSB	Cheyne-Stokes Breathing
CSF	Cerebrospinal Fluid
DAT	Dopamine Transporters
DLB	Dementia with Lewy Bodies
DS	Daytime sleepiness scale
DSIP	Delta Sleep Inducing Peptide
EDS	Excessive Daytime Sleepiness
EEG	Electro-encephalogram
EMG	Electro-myogram
EOG	Electro-oculogram
ESS	Epworth Sleepiness Scale
FLEP	Frontal Lobe Epilepsy Parasomnia

Abb.	Meaning
FSS	Fatigue Severity Scale
GABA	Gama Amino-buteric Acid
GH	Growth Hormone
GHRH	Growth Hormone Releasing Hormone
GND	Ground electrode in polysymnography
ICC	Intraclass Correlation Coefficient
ICHD	International Classification of Headache Disorders
ICP	Intracranial Pressure
ICSD	International Classification of Sleep Disorders
IGF	Insulin-like Growth Factor
IL	Interleukin
INF	Interferons
ISCS	Inappropriate Sleep Composite Score
LDT	Latero-dorsal Tegmental
LH	Luteinizing Hormone
MDS	Movement Disorder Society
MOS	Medical Outcome Study
MPN	Median Pre-optic Nucleus
MSA	Multiple System Atrophy
MSH	Melanocyte Stimulating Hormone
MSLT	Multiple Sleep Latency Test
MWT	Maintenance of Wakefulness Test
NFLE	Nocturnal Frontal Lobe Epilepsy
NGF	Nerve Growth Factor
NMDA	N-methyl-D-aspartate
NREM	Non-rapid Eye Movement Sleep
NTS	Night Time Scale
OSA	Obstructive Sleep Apnea
PD	Parkinson Disease
PDSS	Parkinson's Disease Sleep Scale
PGE2	Prostaglandin E2
PLMS	Periodic Limb Movements in Sleep
POA	Pre-optic Area of Hypothalamus

Abb.	Meaning
PPT	pedunculo-pontine tegmental nucleus
PSG	Polysomnography
PSQI	Pittsburgh Sleep Quality Index
RBD	REM sleep Behavior Disorder
REM	Rapid Eye Movement Sleep
RLS	Restless Legs Syndrome
SAS	Sleep Apnea Syndrome
SCN	Supra-chiasmatic Nucleus
SCOPA	Scales for outcomes in Parkinson's disease
SD	Standard Deviation
SDB	Sleep-disordered Breathing
SDQ	Sleep Disorders Questionnaire
SMI	Sleep Maintenance Insomnia
SOI	Sleep Onset Insomnia
SOS	Sudden Onset of Sleep
SSS	Stanford Sleepiness Scale
SUDEP	Sudden Unexpected Death in Epilepsy
SWDs	Stroke Sleep-Wake Disorders
TCS	Trans-cranial Sonography
TLE	Temporal Lobe Epilepsy
TMN	Tubero-mammillary nucleus
TSH	Follicle Stimulating Hormone
TSH	Thyroid Stimulating Hormone
VIP	Vasoactive Intestinal Peptide
VLPO	Ventro-lateral Pre-optic Nucleus
VMPO	Ventro-medial Pre-optic Nucleus
VNS	Vagus Nerve Stimulation

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Introduction

We spend nearly one-third of our life asleep **(Siegel, 2009).** Over just a few seconds or minutes, there will be dramatic alterations in easily observed physiological variables, including eye closure, breathing, arousability, and muscle tone. Changes in cortical activity and muscle tone are recorded by the electroencephalogram (EEG) and electromyogram (EMG), respectively, and the actual transitions in electrophysiologically monitored state, occur over just a few seconds **(Takahashi *et al.*, 2010).**

Sleep medicine has experienced an exponential growth in the last 30 years. In the new international classification of sleep disorders, more than 80 clinical sleep disorders are codified **(American Academy of Sleep Medicine, 2005).**

A disordered sleep–wake cycle can have major effects on many common neurological complaints such as headache and epilepsy. Furthermore, sleep related disorders such as parasomnias, particularly with agitation, can be hazardous to patients and bed partners while also being diagnostic clues in some neurodegenerative diseases **(Reading, 2010).**

General neurologists agonize over the differential diagnosis between a seizure disorder and any of the parasomnias and worry

mistaking an epileptic absence for cataplexy. Stroke physicians are concerned about sleep apnea as a risk factor for stroke. Movement disorders' specialists are increasingly battling the multiple sleep-related problems associated with Parkinson's disease and allied dysfunctions. Neuromuscular experts dread nocturnal respiratory muscle insufficiency, whereas epileptologists think of sleep as an unknown zone of pathological activity **(Culebras *et al.*, 2007)**

There is increasing evidence that obstructive sleep apnea (OSA) coexists in epilepsy (in 10% of unselected adult epilepsy patients, 20% of children with epilepsy and up to 30% of drug-resistant epilepsy patients). Continuous positive airway pressure treatment of OSA in epilepsy patients improves seizure control, cognitive performance and quality of life **(Manni and Terzaghi, 2010).**

Both sleep and sleep deprivation influence the frequency of epileptiform discharges on electroencephalograms as well as the occurrence of clinical seizures. Effective treatment of sleep disorders can improve seizure control **(Kotagal and Yardi, 2008).**

Excessive daytime sleepiness and respiratory failure during wakefulness and sleep are observed commonly in patients suffering from myotonic dystrophy **(Culebras, 2005).**

Some patients who have neuromuscular disorder exhibit nocturnal hypoventilation in excess of muscular weakness or of diaphragm failure, suggesting an alteration of central respiratory drive **(Culebras, 2005).**

Insomnia is the most common sleep complaint; it affects between 10% and 35% of the population in the western world **(Sateia *et al*., 2000).**

Almost 70% of Parkinson's disease (PD) patients report nocturnal disturbances, including insomnia, nightmares, and excessive daytime sleepiness. In idiopathic PD, both motor symptoms (nocturnal akinesia, early-morning dystonia, painful cramps, tremor, and turning in bed) and the depression that often accompanies the disease can give rise to insomnia **(Askenasy, 2003).**

Around 40% of children with Tourette's syndrome (TS) also have a history of somnambulism, night terrors or enuresis and are prone to confusional arousal **(Iranzo, 2001).**

Sleep disturbances, such as the sundowning syndrome and nocturnal agitation, are found in 25 to 35% of subjects with Alzheimer dementia (AD). Sleep abnormalities are closely parallel to the severity level of dementia **(Vecchierini, 2010)**.

The relationship between sleep and primary headaches has been known for over a century, particularly for headaches occurring during the night or early morning. Migraine, tension-type headache, and cluster headache may cause sleep fragmentation, insomnia, and hypersomnia, causing considerable social and economic costs and several familial problems. Furthermore, sleep disorders may themselves trigger headache attacks **(Aguggia *et al.*, 2011).**

Obstructive sleep apnea (OSA) is gaining recognition as a cardiovascular and cerebrovascular risk factor **(Bagai, 2010).**

Strokes can themselves generate sleep disordered breathing (SDB). There is a bi-directional relation between SDB and cerebrovascular accidents **(Iyer and Iyer, 2010).**

Neurologists, nowadays, consider sleep a trigger, a risk, and a modulator of neurological disorders. In consequence, they are using more and more the sleep laboratory as a standard testing unit for their patients **(Culebras *et al.*, 2007).**