Sleep and Behavioral Disturbances,in Children with Epilepsy

Thesis

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Contents

Subjects	Page
i. List of Abbreviations	I
ii. List of figures	III
iii. List of tables	IV
iv. Introduction	1
v. Aim of the Work	4
vi. Review of literature:	
Chapter 1: Pediatric seizures and epilepsy	5
Chapter 2: Sleep disorders in children	33
Chapter 3: Interface of epilepsy and sleep problems	**45**
Chapter 4: Epilepsy and behavioral problems	**66**
vii. Subjects And Methods	75
viii. Results	80
ix. Discussion	101
x. Conclusion	108
xi. English summary	109
xii. Recommendation	112
xiii. References	114
xiv. Appendix	-
xv. Arabic Summary	-

List of Abbreviations

AB	Aggressive behavior
AD	Anxiety/depression
ADHD	Attention deficit hyperactivity disorder
ADNFLE	Autosomal dominant nocturnal frontal lobe epilepsy
AED	Antiepileptic drug
AP	Attention problems
BCECTS	Benign childhood epilepsy with centrotemporal spikes
BD	Bedtime difficulties
CAE	Childhood absence epilepsy
CAP	Cyclic alternating pattern
CBCL	Child behavior checklist
CF	Cognitive function
CSWS	Continuous spikes and waves during slow sleep
DB	Delinquent behavior
DD	Day time drowsiness
EEG	Electroencephalography
EMA	Epilepsy with myoclonic absence
EME	Early myoclonic encephalopathy
ESES	Electrical status epilepticus during sleep
EWb	Emotional wellbeing
FDG-PET	Fludeoxy glucose - positron emission tomography
GEFS	Generalizied epilepsy with febrile seizures
ICCA	Infantile convulsions and paroxysmal choreoasthetosis
IGE	Idiopathic generalizied epilepsy
JAE	Juvenile absence epilepsy
JME	Juvenile myoclonic epilepsy
LGS	Lennox-gastaut syndrome
LKS	Landau-kleffner syndrome
MAE	Myoclonic-astatic epilepsy
MSLT	Multiple sleep latency test
NDL	Neurodevelopmental lesions
NFLE	Nocturnal frontal lobe epilepsy
OSA	Obstructive sleep apnea
PA	Parasomnias
PCI	Parent child interaction
PDD	Pervasive developmental disorders
PF	Physical function
PRRT	Proline rich transmembrane protein
PSG	Polysomnography
QOLCE	Quality of life in childhood epilepsy
SBQ	Sleep behavior questionnaire
SC	Somatic complains

SF	Sleep fragmentation
SF	Social function
SGE	Symptomatic generalizied epilepsy
SL	Sleep latency
SP	Social problems
SSRI	Selective serotonergic reuptake inhibitor
SWC	Sleep wakefulness cycle
SWS	Slow wave sleep
TLE	Temporal lobe epilepsy
TP	Thought problems
WI	Withdrawn

List of Figures

Fig. No.	Subject	Page
Fig. (1)	Relative incidence of human absence epilepsy syndromes during first two decades of life	22
Fig. (2)	Typical sleep time in children by age group	35
Fig. (3)	Results of the exhaustive CHAID tree analysis for the diagnosis of nocturnal events	65
Fig. (4)	Sleep Behavior Questionnaire (SBQ) scores among studied groups	84
Fig. (5)	child behavior checklist among the studied groups	87
Fig. (6)	quality of life among the studied groups	89
Fig. (7)	Sleep Behavior Questionnaire (SBQ) among the types of epilepsy	91
Fig. (8)	child behavior checklist among the types of epilepsy	93
Fig. (9)	Quality of life among the types of epilepsy	94
Fig. (10)	Sleep Behavior Questionnaire (SBQ) among the severities of epilepsy	96
Fig. (11)	The child behavior checklist (CBCL) among the severities of epilepsy	98
Fig. (12)	Quality of Life (QoL) among the severities of epilepsy.	100

List of Table

Tab. No.	Subject	Page
Table(1)	demographic characteristics among studied groups	81
Table(2)	Clinical features among epilepsy group	82
Table(3)	Sleep Behavior Questionnaire (SBQ) scores among studied groups	83
Table(4)	The child behavior checklist (CBCL) scores among studied groups.	86
Table(5)	Quality of Life (QoL) scores among studied groups	88
Table(6)	Sleep Behavior Questionnaire (SBQ) among the types of epilepsy	90
Table(7)	Child behavior checklist (CBCL) among types of epilepsy	92
Table(8)	Quality of Life (QoL) among types of epilepsy	94
Table(9)	Sleep Behavior Questionnaire (SBQ) among the severities of epilepsy	95
Table(10)	The child behavior checklist (CBCL) among the severities of epilepsy	97
Table(11)	Quality of Life (QoL) among the severities of epilepsy	99

Abstract

Epilepsy is one of the most common neurological disorders affecting about 1% of children. Sleep is a physiological state during which vigilant consciousness is temporarily abolished and responses to environmental stimuli are decreased. It is cyclic and associated to various changes in multiple functions, such as behavior, endocrine and other functions, the sleep/wakefulness cycle (SWC) is regulated by several mechanisms and some of them also affect the expression of epilepsy. These common mechanisms can possibly lead to modifications of the sleep wakefulness cycle in epileptic patients**.** Although sleep disorders are frequent, children with epilepsy are at increased risk due to a number of biological and social factors, epileptiform discharges may be activated by sleep **;** Epilepsy and antiepileptic drugs may alter sleep architecture, leading to daytime somnolence. Children may also experience anxiety symptoms after a diagnosis of epilepsy, which could interrupt sleep**.** The most commonly acknowledged interface between epilepsy and sleep is the recognition that seizures may be more common during sleep and within the period immediately following waking, Sleep deprivation has been used as a powerful provocateur for diagnostic electroencephalography (EEG) in suspected cases of epilepsy in which the standard waking EEG study has failed to demonstrate abnormality**.**

Keywords:

Cyclic alternating pattern, Aggressive behavior, Day time drowsiness, Multiple sleep latency test**,** Sleep behavior questionnaire, Sleep fragmentation

INTRODUCTION

Epilepsy is one of the most common neurological disorders affecting about 1% of children ***(Mendeze et al., 2001).***

Sleep is a physiological state during which vigilant consciousness is temporarily abolished and responses to environmental stimuli are decreased ***(Nunes et al., 2010).***

It is cyclic and associated to various changes in multiple functions, such as behavior, endocrine and other functions, the sleep/wakefulness cycle (SWC) is regulated by several mechanisms and some of them also affect the expression of epilepsy. These common mechanisms can possibly lead to modifications of the sleep wakefulness cycle in epileptic patients ***(Kotagal et al., 2008).***

Although sleep disorders are frequent, children with epilepsy are at increased risk due to a number of biological and social factors,

Epileptiform discharges may be activated by sleep ***;*** Epilepsy and antiepileptic drugs may alter sleep architecture, leading to daytime somnolence. Children may also experience anxiety symptoms after a diagnosis of epilepsy, which could interrupt sleep ***(Legros et al., 2003).***

The most commonly acknowledged interface between epilepsy and sleep is the recognition that seizures maybe

more common during sleep and within the period immediately following waking, Sleep deprivation has been used as a powerful provocateur for diagnostic electroencephalography (EEG) in suspected cases of epilepsy in which the standard waking EEG study has failed to demonstrate abnormality ***(Venturi et al., 2010).***

Comorbidity between epilepsy and sleep disorders exists, resolving the underlying sleep disorder may in turn affect seizure control,

In other cases in which epilepsy impacts sleep, the adjustment of antiepileptic treatment may be effective in resolving the abnormal sleep condition ***(Becker et al., 2003).***

A careful history taking is essential to differentiate the causes of such sleep problems, a distinction needs to be made between sleep *problem* and sleep disorders ***(Venturi et al., 2010).***

There are three different kinds of sleep problems: difficulty falling or maintaining asleep, being sleepy during the day and doing unusual behaviors during his sleep. On the other hand, there are over 80 recognized sleep disorders that give rise to sleep problems.

It is the individual's sleep disorder that needs to be recognized and treated, instead of simply treating the outward symptoms, or the sleep problem ***(Wiggs et al., 2004).***

Also history taking to determine the seizure type and syndrome, current seizure frequency, age at seizure onset, current and previous AED treatment, previous epilepsy surgery, seizure timing (nocturnal if more than 75% of seizures occurred during sleep), etiology (idiopathic, cryptogenic, or symptomatic), cognitive status (normal, learning difficulty or mental retardation), and electroencephalogram findings (background, type, and location of epileptiform discharge, and activation of the discharge with sleep***(Cortesi et al., 1991).***

Etiology was defined as 'idiopathic' (met criteria for a known idiopathic syndrome such as benign rolandic epilepsy or an idiopathic generalized syndrome), 'remote symptomatic' (known underlying cause, or mental retardation in the absence of a known cause) or 'cryptogenic' (did not meet criteria for an idiopathic syndrome and there was no identified underlying significant neurological abnormality or condition ***(VanGolde et al., 2011).***

Surprisingly few studies have focused on sleep disorders in pediatric epilepsy ***(Becker et al., 2003),*** also they do not provide enough details to allow physicians to properly treat these disorders.

AIM OF THE WORK

The aim of the study is to compare sleep patterns, behavioral patterns in children with epilepsy with those of their non-epileptic siblings and to determine which epilepsy-specific factors predict greater sleep disturbance and behavioral disturbances in children with epilepsy for early diagnosis, better management and good quality of life.

Hypothesis:

Sleep disturbances are more common in epileptic children, affecting their quality of life in a negative manner and may be linked to a higher incidence of behavioral changes.

PEDIATRIC SEIZURES AND EPILEPSY

Seizures and epilepsy:

A seizure represents the clinical expression of abnormal, excessive, synchronous discharges of neurons residing primarily in the cerebral cortex. This abnormal paroxysmal activity is intermittent and usually self-limited, lasting seconds to a few minutes ***(Dunn et al., 2003)*** .

On electroencephalography, a seizure ictus is characterized by sustained, abnormal electrical activity that has a relatively discrete beginning and end, and goes through an evolution characterized by changing morphology and amplitude (voltage) of the abnormal discharges. A focal seizure has a restricted regional onset followed by spread to neighboring or remote brain regions. It may spread to deep subcortical regions and result in a generalized tonic-clonic seizure. This is called a secondarily generalized seizure, to differentiate it from seizures that are generalized from the onset, primarily generalized seizures***(Berg et al., 2010).***

When the seizure is prolonged or immediately recurrent without a return of consciousness, this is status epilepticus. An individual is considered to have epilepsy when seizures recur over a period of time without obvious precipitants. Epilepsy is not a specific disease, but rather a condition arising from a variety of pathological insults