Normal Brain Aging; Clinical and Polysomnographic Study

Thesis

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By

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To my loving husband for his unique love, understanding and support

To Rania and Omnia for being my heart sole

To Jana for being my life rosette

And above all, my parents to whom I owe my entire existence and all my success

To all of them, I dedicate this work

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List of Abbreviation

ACTH:	adrenocorticotropine hormone.
AD:	Alzheimer Disease.
AF:	Atrial fibrillation.
AHI:	Apnea/hypopnea index.
ALSWH:	Australian Longitudinal Study on Women's Health.
Apo E:	apolipoprotein E.
APP:	amyliod precursor protein.
bAS:	behavioral active sleep.
BMI:	Body mass index.
bQS:	behavioral quiet sleep.
CAD:	Coronary artery disease.
CAP:	cyclic alternating pattern.
CHF:	Congestive heart failure.
C-IMT:	Coronary intima-media thickness.
CPAP:	Continuous positive airway pressure.
CPT:	core body temperature.
CRH:	cortocotropine releasing hormone.
CRP:	C-reactive protein.
CSA:	Central sleep apnea.
CSR:	Cheyne-stokes respiration.
CT:	Computed Topography.
CVD:	Cardiovascular.
DLBD:	Diffuse Lewy body disease.

DNA:	dinucleic Acid.
ECG:	Electrocardiography.
EDS:	Excessive daytime sleepiness.
SAHS:	Sleep apnea/hypopnea syndrome.
EEG:	electrencephalography.
EMG:	Electromyography.
EOG:	electrooculography.
ESS:	Epworth Sleepiness Scale.
GABA:	gamma aminobutyric acid.
GHRH:	Growth hormone releasing hormone.
GRs:	Glucocorticoid receptors.
H2O2:	hydrogen peroxide.
HPA:	hypthalamo-pitutary-adrenal.
HRT:	hormone replacement therapy.
HW:	Habitwal wake.
ICSD:	International Classification of Sleep Disorders.
IL-6:	Interleukin-6.
ISH:	Isolated systolic hypertension.
LAUP:	Laser-assisted uvuloplasty.
LC:	Locus ceruleus.
MAOI:	Mono-amine oxidase inhibitor.
MEL:	Melatonin.
MMSE:	Mini-Mental State Examination.
MMST:	Mini-Mental State Test.
MRI:	Magnetic Resonance Imaging.
MRs:	Mineralocorticoid receptors.

MSA:	Multiple sleep atrophy.
MSLT:	Multiple sleep latency test.
NA:	Nocturnal awakenings.
NMDA:	N-metheyl D-aspartate.
NO:	nitric oxide.
NOS:	nitric oxide synthase.
NREM:	non rapid eye movement sleep.
O2:	Oxygen.
OH:	hydroxyl radical.
OSA:	Obstructive sleep apnea.
PD:	Parkinson's disease.
PDQLS:	Parkinson's Disease Quality of Life Scale.
PDSS:	Parkinson's Disease Sleep Scale.
PET:	Positron Emission Tomography.
PGO:	pontine-geniculte occipital.
PLMD:	Periodic limb movement disorder.
PLMS:	Periodic limb movement of sleep.
PS:	paradoxical sleep.
PSG:	Polysomnography.
PSQI:	Pittsburg sleep quality index.
PVN:	paraventricular nucleus.
RBD:	REM sleep behavior disorder.
REM:	rapid eye movement sleep.
RF:	Radiofrequency.
RLS:	Restless leg syndrome.
RNA:	ribonucleic Acid.

ROS: reactive oxygen species.

RWA: REM sleep without atonia.

SCN: supra-chiasmatic nucleus.

SDB: Sleep-disordered breathing.

SEA: spontaneous fetal activity.

SOREMP: sleep-onset REM period.

SSRI: Selective serotonine reuptake inhibitors.

SWA: slow wave activity.

SWS: slow wave sleep.

TIAs: Transient ischaemic attacks.

TNF α: tumor necrosis factor alpha.

TST: total sleep time.

UPDRS: Unified Parkinson's Disease Rating Scale.

UPF: Uvulopalatal flap.

UPPP: Uvulo-plasty-pharyngoplasty.

USA: United States of America.

VaD: Vascular dementia.

WML: white matter lesions.

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Abstract

It is well documented that brain aging is associated with many physiological and pathological changes that affect cognition, physical performance and sleep patterns.

It is also necessary to understand that sleep disturbances are considered an important health concern that may affect quality of life, especially in the elderly, who continue to feel the sensation of ill-being. This work was carried on a group of 20 healthy Egyptian elderly (above 60 yr), men and women, with a comparison group of adults (20-32 yr), men and women. The history of sleep characteristics and patterns was evaluated. Radiological and laboratory tests were ran as a routine part of the examination, and finally, an overnight PSG was performed to all subjects to analyze their sleep, to score all the sleep stages, and to detect any sleep disturbance. The study revealed that sleep of the elderly undergoes many changes; it becomes more fragmented with increased number of awakenings and decreased sleep efficiency, as compared to the adults. The most striking change in sleep of the elderly was that their sleep becomes lighter with decreased percentage of slow wave sleep or deep sleep from the total sleep time. Sleep apnea/hypopnea syndrome (SAHS) was the most prevalent sleep disorder among the subjects (90%), the interesting point is that the disorder was present even when the subject had no sleep complaint. Periodic limb movement disorder (PLMD) was also common among the subjects (25%) and all of the examined subjects were unaware of the disorder. REM sleep behavior disorder (RBD) could not be detected in the study sample.

Keywords:

Normal brain
Polysomnographic
Sleep behavior disorder

Introduction and Aim of Work