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From Dreams to Dementia: Shedding Light on the Sleep-Lewy Body Dementia Connection

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"Sleep is the golden chain that ties health and our bodies together."

-Thomas Dekker

Abstract:- Sleep constitutes a significant portion of human life, with individuals spending approximately one-third of their existence either sleeping or attempting to do so.[1] Sleep is critical not only for its comforting effects but also for the maintenance of normal cognitive functioning and human survival. The phenomenon of sleep is complex, with the body unresponsive to cognitive impulses from external stimuli whilst the brain continues to function within various learning and memory-related regions. The time spent sleeping is vital for retaining memory, as it helps to stabilize and improve associations between synapses and various areas of the brain. Sleep is divided into two distinct stages, namely rapid-eye movement (REM) sleep and non-rapid-eye movement (NREM) sleep. Slow-wave sleep, the fourth stage of NREM sleep, is the deepest stage of sleep and promotes muscle and mental health restoration, as well as memory consolidation. [2]

Acquisition, consolidation, and review are the three primary phases of learning and memory. Acquisition refers to the influx of new information into the brain, consolidation to the preservation of memory, and review to the ability to retrieve stored information. Consolidation of memories can only occur during sleep, according to numerous studies, and it does so through the neural networks that control memory. Additionally, different brainwave patterns are associated with the formation of different types of memories.

Keywords:- *Sleep-Lewy Body Dementia Connection, Disrupted Sleep, Lewy Body Dementia, Neurodegenerative Syndromes.*

I. THE LINK BETWEEN SLEEP AND LEWY BODY DEMENTIA: EXPLORING THE CONNECTION

The role of sleep in the formation and maintenance of new memories makes any disturbances in an individual's sleep patterns capable of having enduring impacts on their brain. Early disruptions in sleep patterns may heighten the likelihood of developing dementia later in life. Both inadequate sleep and excessive sleep have been linked to a heightened risk of dementia.[3]

There is mounting evidence supporting a strong correlation between disturbed sleep and the onset of Lewy body dementia, a type of neurodegenerative synucleinopathy. Studies have revealed that sleep disturbances in patients with Lewy body dementia (LBD) can be serious, including insomnia, sleep fragmentation, REM sleep behavior disorder (RBD), motor-related sleep disturbances, restless legs syndrome, periodic limb movements, obstructive sleep apnea, and excessive daytime sleepiness. It has been found that disrupted sleep can elevate the production of beta-amyloid, a protein that is closely associated with the development of Lewy body dementia and Alzheimer's disease. In addition, disturbed sleep can increase inflammation and oxidative stress in the brain, which can harm neurons and contribute to the onset of dementia.

II. DETECTING LEWY BODY DEMENTIA THROUGH SLEEP DISTURBANCES: A CLOSER LOOK

Neurodegenerative disorders such as Parkinson's disease and dementia with Lewy bodies exhibit a prodromal interval characterized by the presence of neurodegenerative symptoms or signs before the full clinical disease manifests. Autonomic abnormalities, olfactory loss, cognitive changes, depression, anxiety, etc., are among the prodromal neurodegenerative markers. However, idiopathic REM sleep behavior disorder (iRBD) is an exception to this pattern. iRBD is a parasomnia that causes individuals to act out their dreams due to the loss of typical paralysis during REM sleep. Observational studies indicate that most people with iRBD eventually develop a recognized neurodegenerative illness, typically diagnosed as synucleinopathy. The average latency between symptom onset and disease progression is over 10 years, suggesting that 1% of the elderly population has an early-stage neurodegenerative syndrome that is readily diagnosable but frequently undiagnosed.[4] Medical professionals are progressively aware of the potential for diagnosing patients with Lewy body dementia (LBD), which has led to modifications in the guidelines to simplify the diagnostic process for LBD patients.

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III. THE IMPACT OF SLEEP DISTURBANCES IN LEWY BODY DEMENTIA: AN OVERVIEW

Sleep disturbances are a prevalent issue for those with Lewy body dementia, resulting in disruptions to the sleep-wake cycle, vivid dreams, nightmares, and excessive daytime sleepiness. The neurodegeneration associated with dementia often causes damage to the internal body clock, leading to a disturbance in the circadian rhythm of sleep and consciousness. The prevalence of sleep disturbance symptoms in dementia patients living at home was 26%, with 19% of clinically significant cases. It is essential that caregivers closely monitor and manage sleep disturbances in individuals with Lewy body dementia. Estimates of the prevalence of sleep disturbances range from 5% to 86%, with 19% of clinically significant cases.[5]

IV. A BIDIRECTIONAL ACCOUNT OF SLEEP AND CAREGIVING

Sleep patterns have a significant impact on both patients and their health carers. Caregiving for individuals with dementia can disturb sleep, as carers experience heightened stress and a greater cognitive load. Poorer sleep quality in carers is linked to a decline in their ability to provide care, negative attitudes, depression, and anxiety. Moreover, insufficient and inadequate sleep is associated with impaired cognitive functioning in carers, as well as an elevated risk of developing Alzheimer's disease or other forms of dementia later in life.[6]

V. LOOKING INTO THE FUTURE

The precise relationship between sleep, sleepiness, and LBD behavioural and neuropsychiatric symptoms is not yet fully understood. If a bidirectional link exists between sleep and these symptoms, it could present a therapeutic opportunity. Current therapeutic guidelines for LBD sleep disturbances primarily involve the use of sleep hygiene and pharmaceutical medications. However, some of these drugs have been associated with adverse effects. Non-pharmacological behavioural treatments, such as sleep hygiene, exercise, or increased ambient light exposure, should also be explored, as they have demonstrated efficacy in other neurodegenerative disorders.[7]

In closing, there exists a close relationship between sleep disruptions and Lewy body dementia, and it is crucial to acknowledge this connection in order to develop effective therapies and interventions for this serious illness. Sleep disturbances can worsen Lewy body dementia symptoms, and addressing such disruptions may be an integral part of a comprehensive treatment plan. It is recommended that further research be conducted on the subject of sleep in LBD patients, as interventions related to sleep could potentially improve their overall quality of life.

Declaration of conflict of interest:

I declare that I have no conflicts of interest related to this essay on Lewy body dementia.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, I have used Grammarly and Quill Bot in order to enhance and paraphrase certain sentences in the article. After using this tool/service, I have reviewed and edited the content as needed and take full responsibility for the content of the publication.

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