Neuroimaging in Dementia With Lewy Bodies- Abhishikta Saha - Queen's Medical Center, Nottingham University Hospitals NHS Trust

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Abstract

Dementia with Lewy bodies (DLB) is one of the most common forms of dementia. It can present as neurocognitive decline, visual hallucinations, and concomitant symptoms of rapid eye movement (REM) sleep behavior disorder. Early diagnosis remains one of the cornerstones of managing this form of neurocognitive disorder but, often, making an early and accurate diagnosis can prove to be challenging. For this article, our goal was to review the utility of various neuroimaging modalities in making a swift and accurate diagnosis of DLB. We used to look for helpful, informative, and peer-reviewed articles. We discussed the role of a plethora of different imaging techniques, ranging from structural imaging like computed tomography (CT) and magnetic resonance imaging (MRI) to molecular imaging (single-photon emission computed tomography, positron emission to- tomography) as a diagnostic tool for DLB. We arrived at the conclusion that these novel neuroimaging modalities have already proven to be very helpful in ruling out differentials and making an early diagnosis of DLB. However, ongoing research is required to increase the diagnostic accuracy, leading to the early identification and treatment of DLB. Introduction And Background There are almost around 850,000 people with dementia in the United Kingdom. The number is thought to rise to 1.6 million by 2040; every one in six people over 80 will have dementia. Dementia with Lewy bodies (DLB) is one of the most common causes of dementia or neurodegenerative disorders, only second to Alzheimer's disease (AD). There are no curative treatments available for DLB yet. However, doctors and scientists across the globe agree that once such treatments are available, patients would most likely benefit from the initiation of treatment as early as possible, which makes early diagnosis of DLB a crucial factor. Diagnosis of DLB remains challenging, and statistics reveal that only 33% of cases are correctly diagnosed. Hence, the most crucial hurdle to overcome in the management of DLB lies in making an early diagnosis and accurately ruling out other possible differentials. Biomarkers are defined as substances in the body that can be objectively measured and able to signify an underlying disease process, preferably at an early stage of the disease. Neuroimaging plays an integral role in the identification of these biomarkers and in this article, we aim to provide a brief review of imaging modalities contributing towards early diagnosis of DLB. Method We has used as the search engine for this literature review. As this is not a systematic review, we have not followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). We have only considered studies performed within the past 10 years specifically on humans. Citations, year of study, subject population were taken into consideration when selecting studies to review from. Studies done on other species or older were not excluded. A total of 33 peer-reviewed articles were included in this study. Data collection has been done ethically and legally to the best of our knowledge.Discussion Lewy Body Dementia/Disease (LBD), otherwise known as dementia with Lewy bodies (DLB), is a neurodegenerative disorder due to pathologic deposits of alpha-synuclein in the brain. DLB presents with an insidious onset and slow progression of symptoms, classified into core and suggestive features. The core features of DLB include varying levels of cognition with remarkable fluctuations in attention and alertness, recurrent visual hallucinations, Parkinsonism-like features. The other suggestive features of DLB consist of similar symptoms indicative of rapid eye movement sleep behavior disorder and severe neuroleptic sensitivity. Clinically, DLB can be notoriously difficult to distinguish from Parkinson's disease dementia (PDD), where the motor symptoms usually precede the appearance of cognitive symptoms. DLB can also co exist with other etiologies of dementia, including AD, especially in the older age group. Structural imaging techniques, such as magnetic resonance imaging MRI) and computed tomography (CT), are very useful in performing volumetric studies in DLB. Structural studies are often also used in the clinical setting to rule out differential diagnoses of various etiologies of dementia, including cerebrovascular disease or intracerebral space-occupying lesions [8]. Using cortical thickness measurement in MRI, Barber et al. found that DLB patients had less volume loss in the regions of the temporal lobe, amygdala, and hippocampus than AD, and no such volumetric difference was observed when compared to vascular dementia (VaD). They also observed an excellent correlation between periventricular hyperintensities and ventricular dilation with increasing age. The grey matter loss in the temporal lobe is also found to be less pronounced in DLB than in AD.

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