Lecanemab: A hope in the management of Alzheimer's disease

Alzheimer's disease (AD) is a neurological disorder which is insidious in onset and results in progressive impairment of cognitive and behavioral functions including attention, language, comprehension, memory, reasoning, and judgment. It is the most common type of dementia, contributing to a major portion of dementia-related disorders in individuals aged above 65 years.[1] The major pathogenetic change in AD is the deposition of insoluble and soluble forms of amyloid-beta (Aβ) protein in aggregated form.[2] The therapeutic agents used currently for the treatment of AD result in temporary improvement of the symptoms but have no role in altering the course of the underlying disease.

Lecanemab is a drug under investigation in a trial for the management of early stages of AD and has been collaboratively developed by Eisai Co., Ltd., Tokyo, Japan, and Biogen Inc., Cambridge, Massachusetts, United States (drug companies) recently. It is a type of monoclonal antibody which is a humanized IgG1 which has a maximum affinity to the soluble Aβ protofibrils. It has proven to decrease amyloid markers in the earlier stages of AD and therefore has reasonably reduced the decline in the impairment of cognitive and functional ability compared with a placebo.[3] Lecanemab is usually well tolerated in individuals with AD. The few most common side effects resulting from the therapy include infusion-related reactions resulting from parenteral administration of the drug, headaches, and abnormalities of the amyloid-related imaging. Both amyloid plaques and neurofibrillary tangles development, which eventually cause AD, are significantly influenced by Aβ. Deposition of the Aβ causes synaptic degeneration interacts with several central nervous system receptors and disturbs the homeostasis of neurons. Hence, most of the treatment therapies against AD are targeted toward Aβ. Most of the recent studies reveal the potential of therapies targeting Aβ to compromise and intervene the long-term brain health by accelerating brain atrophy, which brings newer insight regarding the adverse effect of amyloid-related imaging abnormality.[4] This atrophy of the brain has been related to the elimination of Aβ, as the Aβ levels in the brain are too low to explain such shrinkage. The outcomes of the brain atrophy were not adequately established, in which only a few patients with AD ($1/6^{th}$ of those treated) developed cerebral edema who were treated with lecanemab. In addition, compared to the individuals who received the placebo, the lecanemab therapy resulted in an increased incidence of asymptomatic brain hemorrhages, but not requiring surgery. Nevertheless, only one in the thirty individuals had symptoms connected to the two anomalies.[5]

Fortunately, there are more benefits from the use of lecanemab as a therapeutic agent for the management of AD. People aged over 75 years and male gender had a significant decline (around 40%) in cognitive function. Individuals who lack the e4 version of the apolipoprotein E gene are considered at risk for AD, which may result in early onset of the disease and minor side effects.[6] Long-term research is required for determining the lecanemab's safety and efficacy in the early-stage management of AD. Global health experts have been expecting that despite the controversy, the success of lecanemab will lead to additional expedited drug approvals concerning AD.[7]

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