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Letter to the Editor

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Aducanumab:
A Novel Drug for Alzheimer's Disease; Future Challenges in Treatment

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Dear Editor,

Alzheimer's disease is a common and frustrating disease among older adults. It imposes a high economic and medical burden on society and families. In addition, it is a progressively disabling psychiatric-neurological disorder. However, there is no effective and appropriate drug that ceases or delays the disease process. From years ago, researchers have conducted a lot of research on some antibodies against amyloid plaques, which are the main etiology of this disease. By June 2021, Aducanumab (Aduhelm®) was approved by the Food and Drug Administration (FDA). It was demonstrated that this drug can be an effective intervention to remove and prevent the formation of amyloid plaques. But since widespread research has not yet been done on this drug, many physicians and patients have concerns about its effectiveness and adverse effects. However, many specialists in the Alzheimer's disease field are happy with this drug approval.

Amyloid-β has a key role in the pathogenesis of Alzheimer's disease. In various studies based on genetics and biomarkers, amyloid-β is involved in either familial (early-onset) or sporadic (late-onset) Alzheimer [1].

Acute and chronic exposure to amyloid-β can cause neurotoxicity leading to neurodegeneration. In this way, soluble amyloid oligomers are formed, and amyloid-β misfolding monomers are aggregated [1-3].

Aducanumab is a monoclonal antibody that binds to the amyloid-β complex with high affinity and causes the receptor-mediated phagocytosis Fc (fragment crystallizable) region to be removed. This is while it has less affinity to monomers [4, 5].

Based on the physician's prescription, health centers administer Aducanumab intravenously every four weeks to an Alzheimer's patient. But the question is whether rigid and accurate indications for patients should be considered or not? This is an important issue. Not every Alzheimer's patient can be injected. This drug has been approved in collaboration with an American company (Biogen) and a Japanese company (Eisai).

It can be effective if Aducanumab is administered in the early stages of the disease. But, it is not recommended in moderate to severe Alzheimer's disease as there are concerns about adverse effects such as bleeding and brain edema. Mild adverse effects such as headache, dizziness, and nausea have also been reported. Patients have to get an injection intravenously every four weeks in their lifetime. But it seems that the treatment cost is high. It should be noted that the current ineffective drugs administered for Alzheimer's disease are very costly.

Evaluating treatment challenges with Aducanumab:

1) Is this drug accessible and affordable to everyone?
2) Regarding the fact that aducanumab is a new antibody-based drug, could it have serious adverse effects?
3) Do patients benefit enough from this drug? Are the people who are using it in the early stages of Alzheimer and have not reached the final stages?
4) What are the indications for prescribing it exactly?
5) Could a better drug be designed and marketed?
6) Can patients with other forms of dementia than Alzheimer (vascular dementia, traumatic dementia, parkinsonism) benefit from this drug?
7) Should conventional Alzheimer's drugs (cholinesterase inhibitors) be continued? Should the dose be changed? Interaction?

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Authors' contribution

RB conceived the study, participated in design, and collected the data. YR drafted the manuscript. FS revised the final manuscript for important intellectual content. All authors read and approved the final manuscript.

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Conflict of Interest

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