

Drugs for Alzheimer's disease and Side Effects

Mehrasa Nikandish¹, Lili Arabuli²

The University of Georgia, School of Health Sciences
¹BA student, Pharmacy Bachelor Programme in English;
²Supervisor, Doctor of Chemistry, Associate Professor

Abstract

The main available medications approved by FDA to treat Alzheimer's disease are – Donepezil, Galantamine, Rivastigmine, Memantine and Namzaric, a combination memantine and donepezil (Fig. 1-5), which belong to drugs called “cholinesterase inhibitors”. They prevent the breakdown of acetylcholine, a chemical messenger significant for learning, memory, thinking, language, judgment and other thought processes. Cholinesterase inhibitors increase levels of acetylcholine. Some brain cells produce acetylcholine, which helps deliver messages to other cells. When a message reaches the receptor cell, various other chemicals, including acetylcholinesterase enzyme, break down acetylcholine. Alzheimer's disease destroys or damages cells that produce and use acetylcholine. Thus, acetylcholinesterase inhibitors block the activity of acetylcholinesterase enzyme, but these inhibitors can't reverse Alzheimer's and do not stop the gradual destruction of nerve cells and their ability to improve symptoms eventually declines as brain cell damage progresses. F. e. galantamine stimulate the release of acetylcholine, rivastigmine block the activity of another enzyme involved in acetylcholine breaking down. These two drugs are approved to treat mild to moderate Alzheimer's, but donepezil is used for treating all stages of the Alzheimer's disease. Memantine improves memory, attention, reason, language and ability to do simple tasks. It is used to treat moderate to severe Alzheimer's, as it regulates the activity of glutamate, a chemical involved in information processing. There are many side effects include headache, constipation, confusion, dizziness, loss of appetite, increased frequency of bowel movements, nausea, vomiting etc.

Key words: acetylcholine, acetylcholinesterase, inhibitors, Alzheimer's disease

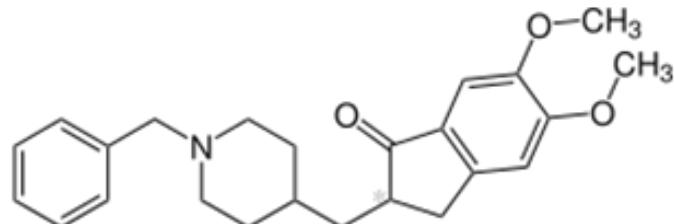


Fig. 1. Donepezil (Aricept)

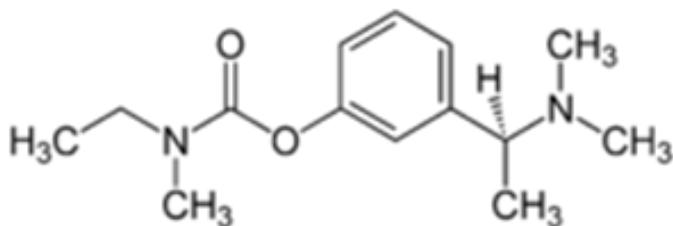


Fig. 2. Rivastigmine (Exelon)

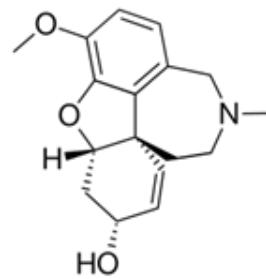


Fig. 3. Galantamine (Razadyne)

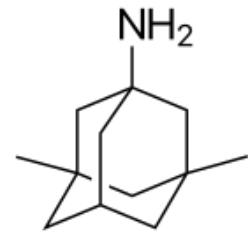


Fig. 5. Memantine



- Neurons
- Synapse
- () Neurotransmitters

Fig. 6. Nerve cells – neurons in the brain, which are destroyed by Alzheimer's disease