Cholinesterase inhibitors for Alzheimer's disease: Multitargeting strategy based on anti-Alzheimer's drugs repositioning

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In the brain, acetylcholine (ACh) is regarded as one of the major neurotransmitters. During the advancement of Alzheimer's disease (AD) cholinergic deficits occur and this can lead to extensive cognitive dysfunction and decline. Acetylcholinesterase (AChE) remains a highly feasible target for the symptomatic improvement of AD. Acetylcholinesterase (AChE) remains a highly viable target for the symptomatic improvement in AD because cholinergic deficit is a consistent and early finding in AD. The treatment approach of inhibiting peripheral AChE for myasthenia gravis had effectively proven that AChE inhibition was a reachable therapeutic target. Subsequently tacrine, donepezil, rivastigmine, and galantamine were developed and approved for the symptomatic treatment of AD. Since then, multiple cholinesterase inhibitors (ChEIs) have been continued to be developed. These include newer ChEIs, naturally derived ChEIs, hybrids, and synthetic analogues. In this paper, we summarize the different types of ChEIs which are under development and their respective mechanisms of actions.

Acetylcholine

Acetylcholinesterase inhibitors

Alzheimer's disease

Donepezil

Galantamine

Rivastigmine

Tacrine

cholinesterase inhibitor

donepezil

donepezil derivative

galantamine

galantamine derivative

memantine

placebo

rivastigmine

rivastigmine derivative

tacrine

tacrine derivative

theophylline

unclassified drug

cholinesterase inhibitor

donepezil

galantamine

rivastigmine

tacrine

abdominal cramp

abdominal pain

age

Alzheimer disease

anorexia

cholinergic system

diarrhea

dizziness

drug absorption

drug blood level

drug efficacy

drug elimination

drug half life

drug mechanism

drug structure

dyspepsia

faintness

fatigue

human

hypertransaminasemia

insomnia

liver toxicity

muscle cramp

nausea

neurofibrillary tangle

plasma clearance

priority journal

Review

time to maximum plasma concentration

vomiting

drug repositioning

Alzheimer Disease

Cholinesterase Inhibitors

Donepezil

Drug Repositioning

Galantamine

Humans

Rivastigmine

Tacrine