INTRODUCTION
Alzheimer's disease (AD) has become one of the common diseases in aged population. It is a neuro-degenerative disease and the most common cause of dementia. Dementia is a brain disorder and affects a person's ability to carry out daily activities (long-term memory loss, confusion, aggression, irritability and mood swings). AD is predicted to affect more than 22 million people worldwide in future. The neuropathology history of AD is not completely explained yet. Therefore, cholinergic hypothesis theory has been accepted and resulting from the cholinergic shortage emerging in the brains of AD patients [1]. Shortage of the neurotransmitters such as acetylcholine and butyrylcholine has been recognized, and therefore, inhibition of the enzymes; acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) that break down acetylcholine and butyrylcholine has considered a standard approach for treatment of AD [2]. Another hypothesis in the pathogenesis of AD is that formation of amyloid plaques containing beta-amyloid peptide in the brains of AD patients. Beta-amyloid peptide is produced after the sequential cleavage of amyloid precursor protein, especially beta and gamma-secretase in the amyloidogenic pathway. This secretases involved in the processing of amyloid precursor protein. The inhibition of secretase enzyme has become another approach in treatment of AD [3, 4]. In addition, medicinal plants also used to treat the AD in Indian traditional system. The medicinal plants have the attractive sources of phytochemical agents with favored biological activities [5]. The aim of this article is to review the ethno-botanical uses of medicinal plants to treat Alzheimer's disease.
safranal could be effective for treating Alzheimer's disease [8].

The cholinesterase inhibitory activity of Zingiber cassumunar (ZC) oil was investigated using microemulsion (ME) technique. By using water titration method, pseudoternary phase diagrams were designed for oil, water, and surfactant/co-surfactant mixture. The inhibition of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) activity were tested using Ellman's colorimetric assay. This study suggested that ZC oil possesses inhibitory activity against not only AChE but also BChE. ZC oil loaded ME might be an smart formulation to treat AD [9].

Zataria multiflora Boiss. (ZM) oil is used in Iranian traditional medicine for treatment of mental abilities. Therefore, the effect of ZM essential oil was investigated in an AD rat model. Amyloid β-protein (Aβ) fragment 25-35 was injected bilaterally in the CA1 region of rats hippocampus and the effect of different doses of ZM essential oil (50, or 100 μL/kg) on cognitive function was investigated in the Morris water maze. This study indicated that ZM essential oil (at a dose 100, μL/kg) might be effective in the treatment of AD [10].

Yokukansan (YKS), a traditional Japanese medicine, was subjected to an in vitro study and results indicated that YKS inhibited Aβ aggregation in a concentration-dependent manner using thioflavin T method. In vivo study indicated that YKS prevented the accumulation of cerebral Aβ and also enhanced the memory disturbance in amyloid precursor protein transgenic mice. The study suggested that YKS could be a effective therapeutic agent to treat AD [11].

The screening of Anticholinesterase activity of endemic plant extracts from Soqotra was demonstrated. Chloroform extracts (at a 50 and 200 μg/ml concentrations) of Croton socotranus, Boswellia socotrana, Dorstenia gigas, and Pulicaria stephanocarpa as well as methanol extracts of Eureiandra balfourii were subjected to anticholinesterase activity using in vitro Ellman method and exhibited inhibitory activities higher than 50 % at concentration of 200 μg/ml [12]. Marapuama (Psychotephala alacoides) is considered as a "brain tonic" in the Amazon region. The effect of ethanol extract of Psychotephala alacoides (POEE) was investigated against Aβ(1-42)-induced cognitive deficit in mice. The POEE (at a dose 800 mg/kg) were administrated Intra-cerebroventricula route (i.c.v) to CF1 mice and observed over14 consecutive days of treatment. The study indicated that POEE could be effective AChE inhibitor and used in the treatment of AD [13].

The effects of ethanolic extract of root and rhizomes of Valeriana amurensis on the expressions of beta-APP, A-beta(1-40) and Caspase-3 of cortical neurons and hippocampus neurons was investigated in Alzheimer's disease model rats' brain using immunohistochemistry method with the help of electron lens. This study indicated that roots and rhizomes of Valeriana amurensis could decrease the expressions of beta-APP, A-beta (1-40), and Caspase-3, and inhibiting the formation of senile plaques.
and neurofibrillary tangles in Alzheimer's disease model rats' brain [14]. The effect of piperine (alkaloid) from fruit of Piper nigrum was investigated for memory performance and neurodegeneration in the Alzheimer's disease rat model. Piperine (at a dose of 5, 10 and 20mg/kg BW) was given orally to Alzheimer's disease rat for the period of 2 weeks before and 1 week after the intracerebroventricular administration of ethylcholine aziridinium ion (AF64A) bilaterally. The study showed that piperine at all dosage range used in this study significantly improved memory impairment and neurodegeneration in hippocampus of Alzheimer's disease rat model [15].

Conclusion

In the traditional system of medicines, many medicinal plants have been used for treatment of Alzheimer's disease. Result from this review indicated that medicinal plants showed potential anticholinesterase and neuroprotective actions for pharmacological investigation both in vitro model using Ellman method as well as in vivo AD rat model. However, a systematic approach is needed to establish the toxicological profile and role of medicinal plants or phytochemical agents responsible for exact mechanism are essential in order to develop novel herbal formulation or phytochemical agents for the treatment of Alzheimer's disease.

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