ROLE OF AYURVEDA IN ALZHEIMER'S DISEASE

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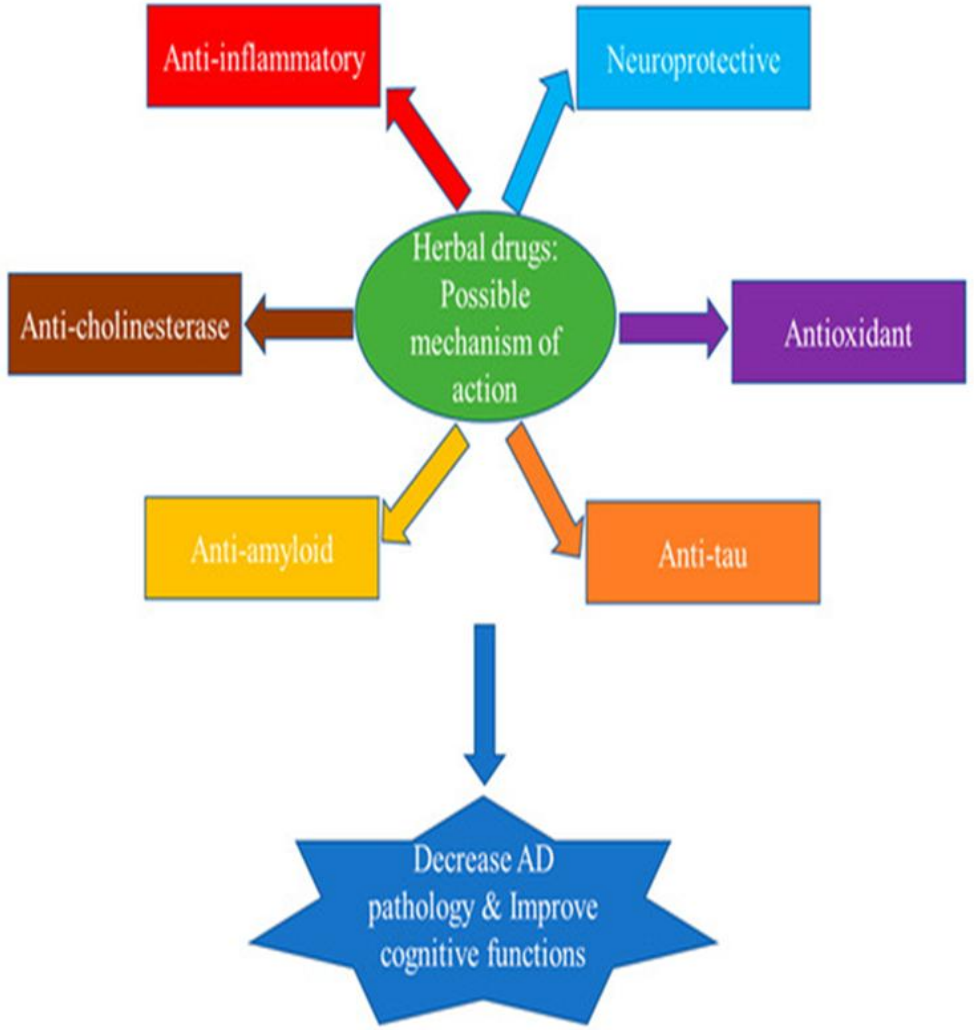
Introduction

- Alzheimer's Disease (AD) is a complex neurodegenerative disease, exact etiology is still elusive. Cholinergic drugs don't alter pathogenesis. Newer drugs(Aducanumab & Lecanumab) target only amyloid, are costly & with high toxicity & limited efficacy. Single targeted therapy is unlikely to work due to complex etiopathogenesis
- Ayurveda with long clinical &traditional knowledge proposes etiology due to imbalance between Prakriti, toxic product of defective digestion- "Ama" &altered gut microbiome. It proposes holistic Personalized Treatment- -Herbal medicines(HM), Panchakarma and nonpharmacological approach -lifestyle modification, improved food habits, reestablishing gut microbiome, yoga &meditation.

Aims: To examine use of Ayurvedic system of medicine in AD

Methods: All information were collected from PubMed, Google scholar, Scopus, Web of science -key words Ayurvedic Herbal Medicine, Gut Microbiome, Yoga, Clinical Trials & Alzheimer's Disease. Human Trials were few. Most of articles were review &from Google Scholar



Results-HM….

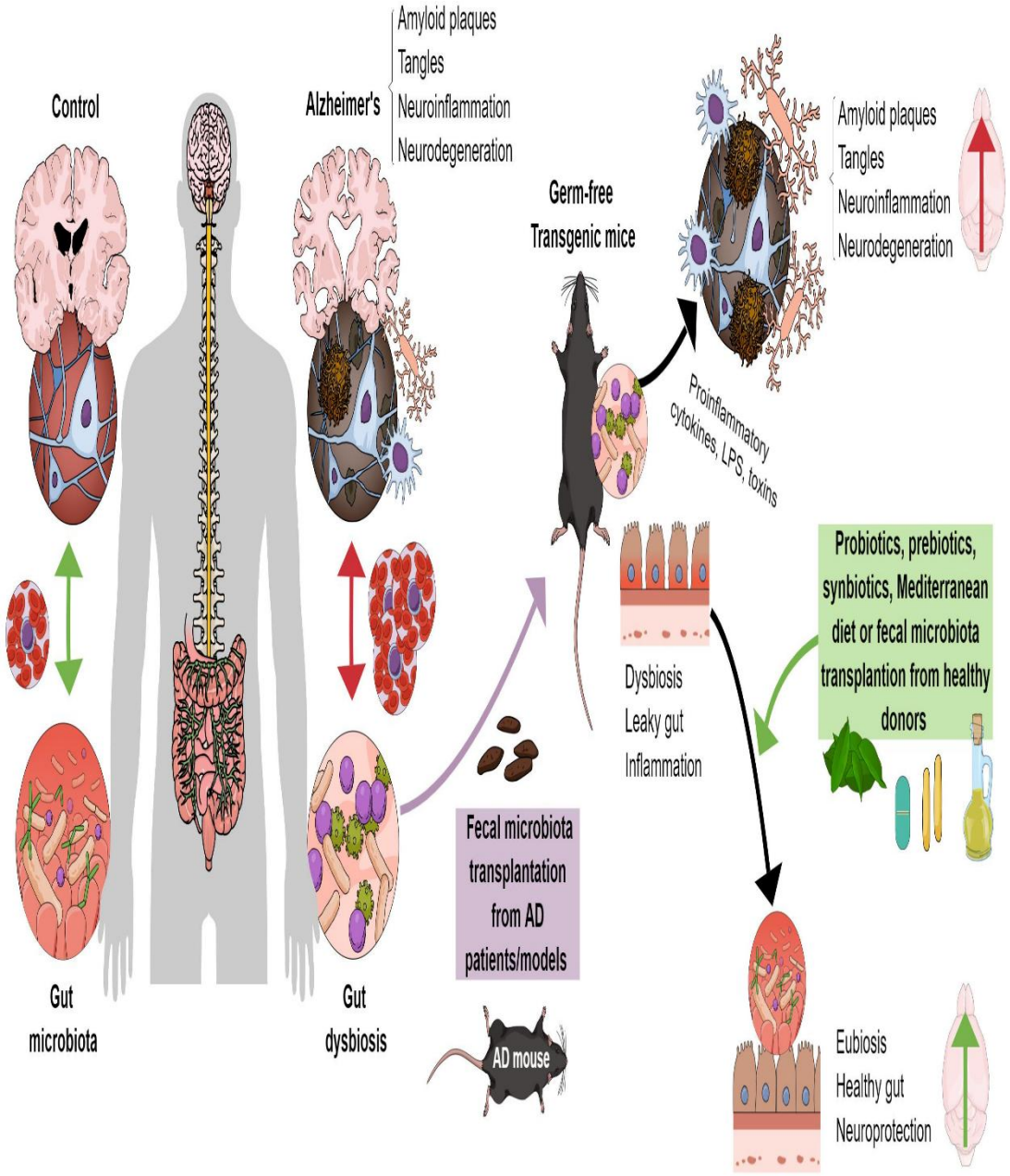
Studies-In vitro, in preclinical (rats),&Humans.,
Herbal Medicines: About Herbs-250 & 700 phytochemicals are there.
Asiatic acid, from *Centella asiatica is* patented for Dementia Others are Ashwagandha (*Withania somnifera),* Sankhupushpi (*Convolvulus pluricaulis),*Guggulu *(Commiphora whighitti)* Ginger *(Zingiber officinale),* Haridra *(Curcuma longa), Tinospora cordifolia, Asparagus racemosus* Willd….
Alterations in Gut Microbiome(GMB) is implicated.
Yoga is helpful in AD

Discussion:-HM

Effectiveness of HM is due to mixture of alkaloids, flavonoids, terpenes& others. They target cellular components-proteins, cell membranes, nucleic-acids, modulate structure & functions, β secretase inhibition… stimulate dendrites & arborisation, neurite elongation, axonal regeneration. Reduced Amyloid beta 1-40 &1-42 in hippocampus, anti-inflammatory (thru Cytokines-TNF alpha& IL6, NF-κB -), antioxidant , antiapoptotic effects Aβ aggregation, activates PI3K/Akt pathway

Pathogenesis-GMB &AD

Environmental factors, diet, sleep &lack of exercise lead to altered GMB & AD



Discussion-GMB&AD…

Derived metabolites from GMB cause altered immunity & cytokine release. Metabolites & vagus nerve trafficked gut-hormones alter BBB & CNS cells, microglia, astrocytes, neurons. Ultimately amyloidosis, tauopathy, neurodegeneration, neuroinflammation occurs causing AD. Herbal Medicines improve GMB

Yoga &AD: Compared to memory enhancing training, Kundalini Yoga practiced elders, >65yrs. showed better executive functioning, reduced neuro-inflammation &exotoxin-1 level

Metabolomics & Network Pharmacology in AD :Metabolomics identify & quantify metabolites in stages of disease &treatment. Network pharmacology makes "ingredients -drugs-targets-diseases" networks, and identifies different target & ways of action. Network pharmacology help to understand traditional HM medicinal potential. They interact with each other in vivo. Will be able to show active components leading to new drug discovery

Conclusion

Combined use of Herbal medicines, yoga &improvement of GMB will be helpful in AD treatment. Combining the triad with conventional symptomatic medications for Dementia like Anticholinergics need to be studied. Screening for amnestic-Minimal Cognitive Impairment and intervention through HM & Yoga may help retard or reverse progression to AD. Feasibility of setting up Comprehensive Alzheimer's Disease Care Center with Neurologist, Psychiatrist, Ayurvedic Physician, Yoga Trainer & Supporting staff to be considered

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