STUDIES ON THERAPEUTIC POTENTIAL OF TWO HERBAL DRUGS IN TREATMENT OF ALZHEIMER’S DISEASE

1. INTRODUCTION:

Memory is ability of an individual to record event, information and retains them over short or long periods of time and recalls the same whenever. Alzheimer's disease (AD) first described by a Bavarian psychiatrist and neuropathologist named Alois Alzheimer in 1907. AD is a progressive neurodegenerative brain disorder that occurs gradually and results in memory loss, unusual behavior, personality changes and ultimately death. It is a chronic, progressive disabling organic brain disorder characterized by disturbance of multiple cortical functions, including memory, judgment, orientation, comprehension, learning capacity and language.

Alzheimer's disease (AD) can be diagnosed with a considerable degree of accuracy. In some centers, clinical diagnosis predicts the autopsy diagnosis with 90% certainty in series reported from academic centers. The characteristic histopathologic changes at autopsy include neurofibrillary tangles, neuritic plaques, neuronal loss, and amyloidangiopathy. Risk factors for Alzheimer's disease include advanced age, lower intelligence, small head size, and history of head trauma; female gender may confer additional risks.

The early symptoms include difficulty remembering names and recent events is often an early clinical symptom; apathy and depression. Later symptoms include impaired judgment, disorientation, confusion, behaviour changes, and trouble in speaking, swallowing and walking. Hallmark abnormalities are deposits of the protein fragment beta-amyloid (plaques) and twisted strands of the protein tau (tangles).

A major discovery of the past two decades in the field of neurosciences has been the elucidation of behavioral, neurobiological and cellular basis of learning processes. Poor memory, lower retention and slow recall are common problems in today’s stressful and competitive world. Age, stress, emotions are conditions that may lead to anxiety, high BP and dementia or to more ominous threats like schizophrenia and Alzheimer’s disease (AD).

Nootropics, popularly referred to as “smart drugs”, are substances, which boost human cognitive abilities (functions and capacities of the brain). Typically these are thought
to work by increasing the brain’s supply of neurochemicals (neurotransmitters, enzymes and hormones) improving brain’s oxygen supply or by stimulating nerve growth⁵.

Dementia is generally defined as the “loss of intellectual abilities (cognitive dysfunction) of sufficient capacity to interfere with social or functioning”. It is not a disease, but rather a group of symptoms caused by the impact of multiple diseased brain. It is usually chronic and progressive in nature with disturbances of multiple cortical functions like memory, thinking, orientation, comprehension, calculation, learning capacity, language and judgment. In dementia, memory capacity to solve problems of day-to-day living, performance of learned motor, social skills and control of emotions are primarily affected.

The most prominent feature of AD is dementia, the American Psychiatric Association defines dementia as a progressive deterioration in global intellectual ability of such severity that it interferes with social and occupational performance. There are two types of dementia: reversible, which is caused by medication, vitamin imbalances or infection; and irreversible, which is due to a progressive neurodegenerative disorder. The time from the onset of symptoms until death ranges from 3 to 20 years and the average duration is about 8 years. The greatest known risk for developing Alzheimer’s is increasing age as many as 10 percent of people 65 years of age and older have Alzheimer’s and nearly 50 percent of people 85 years of age and older have the disease. A family history of the disease is another known risk and having parents with the disease increases an individual’s chances of developing Alzheimer’s.

The cognitive changes that occur in AD are not a part of "normal" aging. Cognition means information processing. Cognitive deficits are recognized as a neurological disorder and are associated with neurodegenerative diseases like AD, senile dementia, Parkinsonism etc. Learning is defined as the acquisition of information and skills. Memory comprises of registration, consolidation and retrieval. Cholinergic neurons in forebrain and brainstem send diffused projections to hippocampus and cortex. Degeneration of the above, nucleus basalis of meynert and septohippocampal nucleus is involved in AD and in learning and short term memory. Neurotransmitters involved in learning and memory process are glutamate, N-methyl-D-aspartate (NMDA), acetylcholine, dopamine, serotonin, noradrenaline, GABA, neuropeptides and neurosteroids⁶.