

Role of Mortality, Hindrance and Immuno-Modulators in Dementia: A Review

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ABSTRACT

Dementia is a syndrome that is any decline in cognition which shows effect on all the daily activities and the loss the memory that is cognitive impairment. Dementia is caused when brain is damaged by diseases, such as Alzheimer's disease or a series of strokes. AD is the most common disease cause of dementia but not all dementia is due to the AD. Dementia is not specific disease it is a syndrome. Dementia is an umbrella for many other diseases like AD. Hindrance of the dementia is done by the several stages and several vaccines are used for the hindrance of the dementia. It is term that is used to describe a range of symptoms that include the loss of memory or the over thinking which in severe causes the declining the memory for the daily activities. Most of the cases are due to the Alzheimer's disease accounts 60%-80% Vascular dementia, which occurs after a stroke, is the second most common dementia type. But there are many other conditions that can cause symptoms of dementia, including some that are reversible, such as thyroid problems and vitamin deficiencies.

Keywords: vascular dementia, hindrance, immuno-modulators.

INTRODUCTION

Dementia is a clinical syndrome characterized by a group of symptoms and signs expressed by difficulties in memory, disturbances in language, psychological and psychological and psychiatric changes, and stultification in daily living activities. It is characterized by decrease in performance and cognitive impairment and effects a person self-determination in doing activities

of daily routine. ^[1] It reduces life span; it makes caregiver's strain at family level. It is expected that the burden of dementia will be increasing in developing countries due to increase in longevity and increasing prevalence of risk factors such as hypertension, stroke and changes in lifecycle. ^[2,3] The common forms of dementia are Alzheimer's disease, vascular dementia and Lewy body dementia. There are different clinical features for the different types of dementia, but all mainly reduce life expectancy, with a mean survival in older people with Alzheimer's of a little over 4 years. ^[4] People with mental disorder which is an intellectual disability are prone to developing dementia in later life. This is mainly important in the context of rising life expectancies in this population. the average life expectancy of adults within developed countries is 66 years and increasing. ^[5,6] In countries like India, for every 10 working age persons there is one elderly person, but this ratio will increase closer to one elderly for every 3 working age population by 2100. ^[7] With increase in the elderly population there would be rise in elderly suffering from dementia as the prevalence of dementia in the elderly is 5% – 7%. ^[8]

Mortality of Dementia

This is from the study conducted in the south India, investigated predictors of morality among the older people living in the community. ^[9] Older people with dementia shows mortality rate 2.3 times and more with cognitive impairment. Post stroke dementia has shown mortality rate by 2.65

times more than in stroke survivors without cognitive dysfunction. [10]

Behavioural and Psychological Symptoms of Dementia

Generally, the patients in dementia present in two ways either with cognitive deterioration or with behavioural and psychological symptoms of dementia. [11, 12]

BPSD are non-cognitive symptoms, including apathy, aggression, delusions, psychosis, hallucinations, anxiety, irritability, depression and sleep disorders. [13]

These patients can persist to either neurologist or psychiatrist. Presence of BPSD has important negative consequences on AD patients and their caregivers. BPSD result in premature consign, increased cost of care and diminished quality of life for both patients and caregivers. [13-18]

Generally, the cognitive symptoms are the main focus for diagnosis and management of dementia, recent years have seen growing importance of behavioural and psychological symptoms of dementia is focused more mainly from the point of management, caregiver's burden, quality of life, and outcome of dementia. Recently some studies have also been done in the developing countries including India by 10/66 group. [19] Generally, BPSD shows impact on decision making capacity in older adults, older adults with dementia presenting BPSD have decreased decisional capacity compared to patients without BPSD. Mograbi et al [20] showed a large community-based study that BPSD correlated with unawareness of memory deficits in dementia, clinical capacity may be negatively affected. Basically, the pattern of BPSD differs depending upon the types of dementia. A study from west India recorded that delusions, hallucinations, anxieties and phobias, and caregiver's distress is significantly more in the Ad patients. [21]

Hindrance of Dementia

Hindrance can be categorized into 3 levels

1. Primary Hindrance
2. Secondary Hindrance

3. Tertiary Hindrance

Primary Hindrance

The first stage for hindrance mainly focuses on reducing the dementia by inscribing risk factors. Generally, not all risk factors can be inscribed as they are unmodifiable factors such as aging, women gender, genetic risk and ethnicity. There are also the modifiable factors such as cardiovascular risk factors lifestyle factors, depression, and head injury these are mainly targeted for the primary hindrance of dementia. [22] Several other lifestyle parameters, including education, smoking, and alcohol consumption may increase the dementia. [27-29]

Secondary Hindrance

Secondary hindrance is step where the early detection before the emergence overt dementia and halts the progression. Early identification of symptoms of cognitive decline has many advantages such as halting the disease process, addressing the reversible causes and vascular risk factors can be controlled, and prevent the progress to severe dementia and cause less severe behavioural and psychological symptoms of dementia. The disease process of dementia starts before the development of clinical symptoms and after onset of first neuropathologic brain lesion before the onset of the first clinical symptom. Mild cognitive impairment is an intermediate prodromal stage of memory loss with normal cognitive function. The different tools are used questionnaires, neuroimaging, biomarkers. In general, the biomarkers are available as the pathophysiological markers such as amyloid beta accumulation and tau mediated neuronal injury and etc. there are few markers amyloid positivity correlate very strongly with the presence of apolipoprotein E4 proteins but they will not correlate with the others. [23] Neuroimaging techniques such as MRI, magnetic resonance spectroscopy, PET, FMRI, are used for early detection of neuropathological changes and other causes

of dementia. [24] Thus, in this secondary hindrance the detection of the symptoms takes place and several techniques were used in hindrance.

Tertiary Hindrance

It is the last step in the hindrance of the dementia which mainly focuses on time to time diagnosis and treatment of cognitive, behavioural and psychological symptoms in the dementia. Pharmacological agents do not have evidence that can conclude the controlling the symptoms of dementia. [25] There is a need for the development of strategy that can reduce the deposition of the amyloid beta protein but however this is difficult in implementing such strategies due to incomplete understanding of disease pathogenesis. [26]

Hindrance by Physical Exercise

Many evidences prove that there is association between the physical exercise and the cognition, physical exercise can improve the cognition in older adults. That effects towards the cognition is shown by the physical exercises such as aerobics and resistance exercises. [30-33] The study shown that the amount of activity is more important than the type of the activity done by the person and the study lacks a pure control group and the all people participated received some from physical and mental exercise. [34, 35] In other studies, it is shown that exercise shows the more effect on decreasing the process cognitive decline. [36] In other older adults who has normal cognitive functioning who engaged with exercise minimum of 30 min often every week showed the Decreasing in the risk of the cognitive decline over 8 years course. [37] In general people with the MCI doing the physical exercise can increase or improvement in the cognitive domains, including the verbal and spatial memory and it can slow down the progression to dementia. [38, 39]

Hindrance by Proper Diet

Nutrition plays a major role in the reducing the cognitive decline in the individuals. According to many evidences

they suggest that the diet interventions can slow down the cognitive decline they form the association to slow down. nutritional styles based on fruits, vegetables, and fish can delay the cognitive decline and as measured across executive function [40] Mediterranean diet shows beneficial effects on both cognitive functioning, memory, language, and domains of the executive function. [41] Many studies suggest that the hybrid diet is associated with the delayed age-related cognitive decline and lowered risk for AD. [42,43] Many beneficial effects were shown and reported by isolated studies for other nutrients, including green tea extracts, concord grape juice, chromium picolinate, vitamin D, beta carotene. [44- 49] According to the Finnish diabetes hindrance studies more intake of unsaturated fatty acids and less intake of saturated fatty acids can show better cognitive performance in a period of 13 years. [50, 51]

Hindrance of Dementia by Immuno-modulators

This is done by the using vaccines and passive immunization with chimeric antibodies. These immunizations include either use of tau peptide conjugates or the use of prefibrilized synthetic. In rodent models, active vaccination is characterised by the decreasing in the tau oligomer aggregation, hyperphosphorylation, and neurofibrillary burden. [52] In human the initial vaccines used is AN1972 had shown the most relevance effect on the cognitive functioning and clinical trials halted due to adverse effect of sub-acute meningoencephalitis. [53] New vaccines containing multiple small fragments of amyloid beta protein fragments linked to carrier made of the inactivated diphtheria toxin in the phase II trials. [54] But they were not so effective so they were not in use. [55] Individuals with dementia treated with bapineuzumab showed no substantial improvement in any cognitive outcome primarily and main effective drug is vasogenic cerebral edema. [56]

CONCLUSION

Several hindrance methods were shown but there are less evidences to show the associative between the strategy and development progress. Generally, the hindrance is mainly targeted on the amyloid cascade. Hindrance of dementia at different stages of the disease is studied by different strategies. Studies to date indicate that a multifactorial intervention approach characterized by regular exercise and healthy diet, along with the amelioration of vascular risk factors, psychosocial stress, and major depressive episodes, may be most promising for the hindrance of cognitive decline. Further studies may help to study and determine about the cognitive decline stages.

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