Clinical Research

Evaluation of diet and life style in etiopathogenesis of senile dementia: A survey study

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Abstract

Mind and body are inseparable entities and influences each other until death. Many factors such as stress, anxiety, depression, negative thoughts, unhealthy life style, unwholesome diet etc., disturb mental and physical wellbeing. Senile dementia is the mental deterioration, i.e., loss of intellectual ability associated with old age. It causes progressive deterioration of mental faculties, e.g., memory, intellect, attention, thinking, comprehension and personality, with preservation of normal level of consciousness. Two major types of senile dementia have been identified, namely that due to generalized atrophy in the cortical area of the brain (Alzheimer’s type) and that due to vascular disorders mainly due to stroke. According to DSM-IV (diagnostic and statistical manual of mental disorders), the essential feature of dementia is the development of multiple cognitive deficits that include memory impairment and at least one of the following cognitive disturbances such as aphasia, apraxia, agnosia, or a disturbance in executive function. For the present study, a standardized questionnaire in the form of proforma incorporating types of foods (madhura, amla and lavana rasayukta ahara etc.) and life style (divaswapna, ratrijagarana and manasika bhavas etc) is prepared. To assess manasika bhava, Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale, Brief Psychiatry Rating Scale, and standardized gradations of anumana pariksha of manasika bhavas mentioned by Charaka at Vimana Sthana 4/8 were adopted. In this study, most of the patients had disturbed sleep, tendency to indulge in defective dietary habits and kapha vitiating diets and life style. On Hamilton Anxiety Rating Scale, patients had anxiety, tension, depression, difficulty in concentration, and memory. On Hamilton Depression Rating Scale, these patients had anxiety, depression, and hypochondriasis. On Brief Psychiatry Rating Scale, psychological factors affected include: anxiety, depression, somatic concern and tension, etc. The data reflects that unwholesome diet and disturbed mental health plays an important role in etiopathogenesis of senile dementia.

Key words: Alzheimer’s disease, psychological factors, senile dementia, vascular dementia

Introduction

Dementia is a progressive degenerative disease of the brain and affects mainly elderly persons. Memory impairment is the essential feature of this disease which is characterized by multiple cognitive deficits that includes impairment in memory and at least one of the following cognitive disturbances such as aphasia (language disturbance), apraxia (impaired ability to carry out motor activities despite intact motor function), agnosia (failure to recognize or identify objects despite intact sensory function), or a disturbance in executive functioning (i.e., planning, organizing, sequencing, abstracting) and which occurs exclusively without impairment in consciousness. The other cognitive functions that can be affected in dementia include general intelligence, learning, language, problem solving, orientation, perception, attention and concentration, judgment and social abilities. The personality is also affected. Agitation or withdrawal, hallucinations, delusions and insomnia are also common. The diagnosis of dementia, according to DSM-IV, requires the symptoms that result in a significant impairment in social or occupational functioning and that they present a significant decline from a previous level of functioning. In normal ageing, minor memory problem can occur but it does
not become severe and do not interfere significantly with a person’s social or occupational behavior, which is commonly found in dementia. Dementia if not properly managed, such patients may become helpless, incapable of remembering the names of close relatives, and may wander into dangerous situations being oblivious of their surroundings.

With an increase in life span and decrease in death rate, the prevalence of dementia is rising all over the world. Of all patients with dementia, 50 to 60% have the most common type of dementia, i.e., dementia of Alzheimer’s type. Worldwide, there is a new case of dementia every seven seconds and more than 35 million people are currently estimated to have dementia with more than 4.6 million new cases diagnosed each year.[4] The number of people suffering from dementia is expected to be 107 million by the year 2050. More than 60% of people with dementia currently live in developing countries. Numbers are increasing, especially in rapidly developing and heavily populated regions such as China, India, and Latin America. It is estimated that there are already approximately 1.5 million people affected by dementia in India and this number is likely to increase by 300% in the next four decades.[5]

This disorder may be progressive or static, permanent or reversible. An underlying cause is always assumed, although in rare cases it is impossible to determine a specific cause. The potential reversibility of dementia is related to the underlying pathological condition and to the availability and application of effective treatment. Approximately 15% dementia is reversible if treatment is initiated before irreversible damage takes place. More women have Alzheimer’s disease than men; this may reflect women’s longer life spans. Among the people above 65 years, men and women reported to have 0.6% and 0.8% prevalence rate, respectively. At age 90, these rates are 21% for men and 25% for women. The prevalence of moderate to severe dementia in the population over 65 years is approximately 5% and 20% to 40% in older than 85 years of age. The prevalence of dementia nearly doubles with every 5 years of age after the age of 60 years. The 1% of people aged 60 to 64 years are affected with dementia, 2% of aged 65 to 69 years, 4% of aged 70 to 74 years, 8% of aged 75 to 79 years; 16% of aged 80 to 84 years, and 30% to 45% of aged 85 years and above, respectively.[5]

According to the 1997 American Psychiatric Association Practice guideline for the treatment of patients with Alzheimer’s disease and the dementia of late life, the onset of disease generally occurs in late life, most commonly in the 60s, 70s and 80s and beyond, but in some instances the disorder appears in the 40s and 50s known as early onset dementia. The second most common type of dementia is vascular dementia, which is usually related to cerebrovascular diseases. Hypertension predisposes a person to the disease. Vascular dementia account for 15 to 30% of all dementia cases and is most common in people between the ages of 60 and 70 years with more common in men than women. Approximately 10 to 15% of patients have co-existing vascular dementia and dementia of the Alzheimer’s type. Dementia affects more than four million Americans and results in a total health care cost of more than $100 billion annually.[6]

Though senile dementia is not described as a separate disease entity in Ayurveda, however, some Ayurvedic terms can be correlated to dementia. Smritinasha is mentioned among the prodromal symptoms of jara (ageing).[5] Further, smritibhramsha is described as symptom where smriti (memory) is vitiated by rajas and tamas.[6] Thus, senile dementia can be interpreted as Jaranajanya smritibhramsha according to Ayurveda. Today, dementia has become the burning problem of old as well as younger persons. But, the cause of dementia of the Alzheimer’s type remains unknown. Some studies have indicated that as many as 40% of patients have a family history of dementia of the Alzheimer’s type. Thus, genetic factors are presumed to play a part in the development of the disorder, in some cases,[7] of course yet no definite drug is available. Early diagnosis and timely medication have become difficult due to unavailability of sophisticated equipments and high cost. Moreover, no direct therapy is available, which can reverse or retard the pathophysiological processes permanently. Though cholinesterase inhibitors such as tacrine, donepezil, rivastigmine are used since long times but they do not provide satisfactory results. Ayurveda has created an interest by the use of Medhya rasayanas in treating various psychiatric illnesses. As dementia is an Urdhva satrugata disease, Nasya especially pratimarsa nasya can be of great help to old individuals. Nasya as therapy is indicated in various neuropsychiatric disorders viz. Unmada and Apasmara.[8] Role of free radical is well established in etiopathogenesis of Alzheimer’s type of dementia. Vitamin C, E etc., having anti-ageing property are some of the known antioxidants, which can prevent oxidation and rancidity of fat or oil. The present study has been designed with the aims and objectives to evaluate the effect of dietetics and lifestyle in etiopathogenesis of senile dementia.

Materials and Methods

Total 91 patients between 60-90 years attending the OPD of Kayachikitsa I.P.C.T. and RA hospital, Jamnagar fulfilling the clinical criteria of senile dementia based on detailed history according to both Ayurvedic and modern parameters were registered in this study. They were screened for any neuropsychiatric disorders. The patients below 60 and above 90 years suffering from psychiatric and neuropsychiatric diseases such as Schizophrenia, Parkinsonism, Huntington’s disease, Pick’s disease etc, persistent endocrine disorders and other systemic disorders; and who were on psychotropic drugs including alcohol were excluded from the study; Serum cholinesterase enzyme was investigated as biomarker and Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale, and Brief Psychiatric Rating Scales and standardized gradations of anumana pariksha of manasika bhava were applied in registered patients. For the present study, a standardized questionnaire in the form of proforma incorporating types of foods (madhura, amla and lavana rasayukta ahara etc.) and lifestyle (dvitwapna, prati jagarana and manshika bhava etc) was prepared.

Observation and Results

The demographic data revealed that maximum patients (71.42%) belonged to the 60–70 year age group followed by 21.97% in the 70–80 year age group, which is of vata predominance. Rujas in association with vata vitiate tama and play an active role in manifestation of smritibhramsha. Maximum patients (73.62%)...
were male and 26.37% were female that showed dementia is of marked male predominance. Maximum patients (89.01%) were Hindu due to the dominance of Hindu population in this area. Majority of patients were educated (83.52%), retired (47.25%), married (98.90%) and from middle class (68.13%). They were engaged in their own business or household work and had some kind of derangement in their social and occupational functioning like forgetting names, mistake in accounts, paying bills, mislaying objects etc., which might have led them to attend for treatment. The 37.36% patients had good appetite followed by 24.17% moderate appetite which excludes dementia of metabolic disorders. Maximum patients (68.13%) preferred madhura rasas followed by 67.03%, 49.45%, 59.34% patients amla, lavana and katu rasas, respectively. Excessive indulgence in madhura rasas increases kapha dosha, a causative factor of Smritibhramsha. Dietary factors play a major role in the pathogenesis of dementia. Maximum patients (53.84%) had tendency to indulge in vishamashana (untimely diet) followed by 25.27% and 4.39% patients in samashana (taking wholesome and unwholesome diet together) and anashana (fasting), respectively. Maximum patients (58.24%) reported disturbed sleep, which suggests involvement of anxiety, stress, and other psychic symptoms probably due to decreased ability in performing daily routine. Age-related predominance in vata is involved in individual’s bowel habits, which essentially lead to have kruha koshtha (constipation). The 68.13% patients had kruha koshtha, 16.48% mridu koshtha, and 15.38% madhyama koshtha. Vata dosha dominance is suggestive of kruha koshtha and prime causative factor for all neuropsychological disturbances. Sleep disorders are major manifestation in old age and maximum patients (62.63%) indulge in day sleep and night awakening (60.43%) to increase kaptha and vatadoshas, respectively. Both these doshas are causative factors in smritibhramsha.

Body constitution of an individual is of prime importance in health and disease. All the patients had dvandra prakriti with highest number of patients (72.52%) having kapha pittaja prakriti indicating the type of constitution at more risk in developing this disease. 50.54% patients had tamas predominance in manas prakriti. Tamas is one among the causative factors in smritibhramsha. Saratva is the supreme part of dhatu providing strength to that particular dhatu and resistance to the disease. Absence of saratva (best quality of dhatu) especially of rasa, rakta, and majja seems to be a risk factor for smritibhramsha. The 81.31% patients had madhyama satva, whereas 15.38% had avara satva. Samhanana means compactness of body and pranana is measurement of bodily organs. The 81.31% patients had madhyama samhanana and 97.80% patients had madhyama pranana. Satva determines mental faculty. Most of the patients (94.50%) had madhyama satva. Charaka has mentioned that a person having madhyama and avara satva are more vulnerable to diseases, which is supported in this study. Satmya stands for factors wholesome to the individual when used continuously.

All the patients (100%) complained of forgetfulness, followed by 98.90% patients having complaints of numbers forgotten and objects misled each. 95.60% patients had impaired attention followed by 89.01% having irritability and 82.41% having forgotten names. 75.82% patients had decreased efficiency in household tasks followed by 70.32% patients having mistakes in accounts and 61.53% patients having not recognized familiar faces and 58.24% patients having disturbed sleep. 96.70% patients had depression and 97.80% had anxiety and used to lose valuables. Serum cholinesterase was investigated as biomarker in these patients. Its normal value ranges between 4620-11500 U/L in males and 3950-10800 U/L in females.[16] In dementia, this enzyme which establishes dementia is decreased[16] in 94.59% patients. On Hamilton Anxiety Rating Scale, it was observed that 97.80% patients had anxious mood, followed by 96.70% having depressed mood, 96.70% patients having difficulty in concentration and memory and tension. The 58.24% patients had insomnia and 75.82% patients had fear. The 53.84% patients had gastrointestinal symptoms and 86.81% patients had behavioral problem. On Hamilton Depression Rating Scale, it was found that 96.70% patients had depressed mood followed by 97.80% having anxiety psychic symptoms, 27.47% anxiety somatic symptoms, 85.71% difficulty in work and activities and 53.84% with somatic gastrointestinal (GIT) problems followed by 83.51% patients with hypochondriasis, 53.84% with hopelessness, and 40.65% patients with helplessness. On Brief Psychiatric Rating Scale, it was observed that maximum patients were suffering from anxiety (97.80%), depression (96.70%), somatic concern (98.90%), and tension (96.70%). The 71.42% patients had disorientation in activities, 56.02% had conceptual disorganization, and 73.62% patients had blunted affect followed by 59.34% patients and 60.43% patients with unusual thought contents and excitement, respectively. Manas pariksha bhava showed that all patients had involvement of manas bhava such as smriti (memory) (100%), vijana (knowledge) (79.12%), virya (energy) (69.23%), sanjna (recognition) (94.50%), moha (unconsciousness) (3.29%), kroda (anger) (93.40%), bhaya (fear) (78.02%), shoka (grief) (61.53%), medha (intelligence) (96.70%), shraddha (desire) (47.25%), priti (pleasure) (84.61%), harsha (joy) (86.81%), avasthan (stability of mind) (42.85%), manasa (32.96%), raja (attachment) (16.48%), upadh (deception) (93.40%), dhairy (courage) (91.20%), and dvisha (dislike) (9.89%).

Chaudhuri, et al.: Diet and life style in senile dementia
patients had madhyma rasa satmya. However, most of the time, it is difficult to get a proper history from the patient due to their unawaresness towards their diet. The capacity for intake of food can be examined in two ways, viz. the power of ingestion as well as the power of digestion. Charaka has stated that both the strength and lifespan are determined by the diet of the individual. The maximum (47.25%) patients had madhyma abhayarana shakti followed by 40.65% having avara abhayarana shakti. Similarly, maximum patients (46.15%) reported madhyma jarana shakti followed by 41.75% having avara jarana Shakti, i.e., their digestive power is disturbed by vata and kapha doshas. Madhyama aharashakti correlates with the findings of rasavaha and annavaha srotodusti lakshanas like aruchi, arasagata, etc. Vayama shakti of a patient is determined by the ability to perform work. Here, 72.52% patients had madhyma yavama shakti. The 84.61% patients belonged to sadharana desha. Though sadharana desha is good for healthy living, patients are more susceptible to indulge mithya ahar vihara that may produce smritibhramsha.

Discussion

All symptoms reported in the patients are suggestive of neuropsychological disturbance and impairment in intelligence may be due to the involvement of rajas and tamas, which are responsible for smritibhramsha. Moreover, all symptoms observed are suggestive of decreased level of acetylcholine[12] and acetyl cholinesterase[13] in the brain particularly in dementia of Alzheimer’s type, which can be interpreted in terms of disturbance in the function of Sadhakapitta. It also signifies deranged condition of dhi, dhriti, and smriti.

Hamilton Anxiety Rating Scale was applied for checking the morbidity of anxiety with senile dementia. On analyzing the scores obtained, it was found that patients had anxious mood, followed by depressed mood, difficulty in concentration and memory and tension. The patients had insomnia, fear, gastrointestinal symptoms and behavioral problem. All these findings support the mind–body relationship affecting each other. Similarly, Hamilton Depression Rating Scale implied that patients had depressed mood followed anxiety psychic symptoms, anxiety somatic symptoms, difficulty in work and activities and somatic GIT problems followed by hypochondriasis, hopelessness and helplessness. The findings of this scale clearly indicate that maximum patients suffering from dementia in old age are prone to depression and anxiety. It may be due to their inability to perform usual household duties and feeling difficulty in adaptation with the surrounding. Brief Psychiatric Rating Scale implied for gross evaluation of all psychiatric disorders. Here, it indicates that maximum patients were suffering from anxiety, depression, somatic concern, tension, disorientation in activities, conceptual disorganization, blunted affect followed by unusual thought contents and excitement. These symptoms are clearly suggestive of neuropsychological disturbances in old person suffering from dementia. Evaluation of the Manas paridsha bhava revealed that all patients had involvement of manas bhaiva such as smriti, viprana, virya, sanjna, moha, krodha, bhaya, shoka, medha, shraddha, priti, harsha, avasthan, manasa, raja, upadhi, dhaiyra, and dvvesha, which shows that these factors play an important role in the pathogenesis of smritibhramsha. In anxiety, stress, level of cortisol and 5-hydroxytryptamine in brain, are found elevated,[14] which alters the function of hypothalamic-pituitary-adrenal axis and may result in the decrease of cholineacetyltransferase, acetylcholine[15] and serum cholinesterase[16] in brain and cause dementia. In depression also, acetylcholine and other cholinesterase enzymes may be altered due to the decrease of dopamine and 5-hydroxytryptamine in brain, which ultimately disturbs the function of hypothalamic-pituitary-adrenal axis and may cause dementia. Kapha was increased in 50.54% patients followed by vata and pitta in 37.36% and 12.08% patients, respectively, suggesting that kapha is a prime causative factor in smritibhramsha, which supports the statement given by Charaka in Shariristhan[17] where Charak has quoted that when mind is afflicted by moha, it leads to Smritibhramsha. As per Charak,[18] excessive kapha causes moha. Kapha in normal condition controls dhi (intellect) and dhriti (controlling power, which prevents mind from indulging in harmful objects).[19] In vitiated condition, kapha dosha can obstruct srotas of dhatus by hardening of dhamani (dhamani pratichaya),[20] which ultimately hampers the normal supply of rasa, rakta to the brain tissue leading to vitiation of vata, which ultimately causes derangement of memory and other cognitive impairment establishing dementia. Vitiated kapha in this way can vitiate Udana vayu, Prana vayu, Vyana vayu, Tarpaka kapha, Avalambaka kapha and Sadhaka pitta, which are all responsible for proper functioning of buddhi, medha, smriti, etc.

Dhamani pratichaya denotes the atherosclerotic changes of vessels, which occurs due to accumulation of lipid particularly cholesterol and cholesterol esters in the walls of the vessels.[21] These lipid materials are similar in nature with kapha, which is increased due to excessive intake of kaphavridhikara abhara (various types of sweets, butter, cheese, curds, etc.) and vihara (divaswapna etc.) for long time. In this study, it was found that maximum patients were taking fatty and oily foods since five or more years. Moreover, obesity, hyperlipidemia, diabetes, etc. can cause dementia[22,23] Recent studies reveal that the foods containing more fats and oily substances having deficiency in omega-3 fatty acids cause Alzheimer’s disease.[24,25] In this survey study, patients were found to have taken excessive fatty and oily substances, which might have been deficient of omega-3 fatty acid that caused dementia. Due to vitiation of rasa, rakta, and other dhatus, especially asthi and majja do not get their proper nutrition causing signs and symptoms of asthi and majja dushti. In this study too it was found that asthi, majja, rasa, dhatus, and their respective srotas were vitiated in 91.20%, 90.10%, 76.92% patients, respectively. Annavaha srotas was vitiated in 46.15% patient and purishavaha srotas was vitiated in 69.23% patients. According to Dalhana[60] purishadhara kala is asthidhara kala and pittdhara kala is majjadhara kala. When purishadhara kala and majjadhara kala are vitiated, asthidhara kala and pittdhara kala will also be vitiated, respectively. The 43.95% of patients had chronicity of three months to one year followed by 19.78% of one-two years and 14.28% for more than six years. The 36.26% patients were in mild stage of dementia followed by 43.95% and 19.78% in moderate and severe stage of dementia, respectively. No inference could be drawn from this data as sample was not sufficient. The 62.63% patients had body weight between 50-70 kg followed by 29.67% and 7.69% between 30-50 kg and 70-90 kg respectively, indicating that maximum patients had moderate body weight. As weight loss is
a common occurrence in Alzheimer’s disease and maximum patients had moderate body weight, it can be inferred that body weight is not much affected by dementia in this series of patients. The 76.92% patients had a height of 60-70 inches followed by 21.97% patients having height of 50-60 inches indicating that maximum patients had medium height, i.e., it is not affected due to old age. The 68.13% of patients had Ponderal Index between 11-13 followed by 29.67% patients between 13-15. This data shows that maximum patients had medium height status. Body surface area wise, maximum patients (42.85%) had Body Surface Area (BSA) within range of 1.60-1.80 M² indicating that body surface area of maximum patients was within normal range as it depends on height and weight, which were normal in maximum number of patients.

Conclusion

The survey study concludes that unwholesome diet, kaphavridhikara ahara and vihara, stressful lifestyle with sedentary habits as well as depressed mood, negative thoughts, and-abstinence from sadruttta, swasthavrittta disturb one’s psychological health and play an important role in dementia in old age by vitiating rajas and tamas manasika doshas, Prana, Udana, Vyana vayu, Rasavahasrotas, Majjavaha Srotas, Manovaha srotas, and Ojas. However, to reach at a definite conclusion we need to compare the dietary data in inflicted population to that of standard non dementia population to see if there are real differences to note. Similarly, a dietary factor as reason to dementia may require a prolong period of consumption to give rise to its pathological effects. Any such study would therefore require retrospection about any change in dietary pattern among the patients in their recent past to note if it has affected the pathological process. All these factors can be explored in larger sample for longer duration by future researchers interested in this subject, though the diet with deficiency of omega-3 fatty acids has a direct impact on Alzheimer’s disease. Patients who reported manovighatakara bhara like bhaya, chinta, shoka, dvesha, krodha, and moha and taking vatakaphrapakpa ahara vihara are at a high risk for developing smritibhramsha. Dementia is a progressive degenerative disease of brain. There is no definitive treatment for this disease till now. The drug regimen (Aushadha) needs to be well integrated with healthy diet (Ahara) and healthy life style (Charya) to attain the objective of healthy aging in support of Government of India’s national campaign on geriatric health to make senior citizens healthy and happy.

References

Chaudhuri, et al.: Diet and life style in senile dementia


हिंदी सारांश

जरावस्थाजन्य स्मृतिभ्रंश पर आहार एवं जीवनशैली का मूल्यांकन

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शरीर एवं मनस जीवनपर्यन्त एक दूसरे को प्रभावित करनेवाले अवयव हैं। मनुष्य के आहार की अनियमितताएं एवं विषमताएं तथा जीवन के अन्थनक स्थान उसकी मनोदर्शक स्वास्थ्य पर प्रतिकूल प्रभाव डालती हैं। जरावस्थाजन्य स्मृतिभ्रंश एक ऐसी व्याधि है, जिसमें रूपी की चेतनता अप्रभावित रहते हुए उसकी बाह्यक्षणताओं यथा– धी, धृति, स्मृति आदि में निरंतर हास्य होता रहता है। यह व्याधि दो रूप में प्रकट होती है, प्रथम वह जिसमें मस्तिष्क के कॉर्टिकल क्षेत्र में शोष होता है (अलजाईमर रोग), दूसरी वह जो रक्त प्रवाह में अवरोध के कारण होती है (स्ट्रॉक्क.) डी.एस.एम. ५ के अनुसार स्मृतिभ्रंश का प्रमुख लक्षण बुद्धिविश्राम संज्ञानात्मक न्यूरनता का उत्पत्ति होता है। वर्तमान अध्ययन में यह पाया गया कि जिन रूपों के आहार, निद्रा एवं जीवनशैली में व्यतीत किए जा रहे सामान्य और अन्य रूपों में हैमॉल्टन ईजजाइटी यूटुइंग स्केप एवं हैमॉल्टन डिप्रेशन रेंटेङ्ग स्केप जैसे मनोवैज्ञानिक स्केप के आधार पर तनाव, चिंता, एकाग्रता का अभाव आदि लक्षण प्राप्त होते हैं। वे तथ्य जरावस्थाजन्य स्मृतिभ्रंश की समस्या में मिठ्या आहार–विहार एवं मानसिक भावों की प्रबल यूर्मिका को दर्शाते हैं।