Review Article

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A CONCEPTUAL STUDY ON TRIDOSHA PERSPECTIVE OF MILD COGNITIVE IMPAIRMENT: A REVIEW

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ABSTRACT

Mild cognitive impairment is featured by its utility to identify individuals more susceptible to Dementia. In Ayurveda, this condition can be studied as a prodromal stage of diseases causing impairment in cognition; Tridoshas, by its unique nature of maintaining and vitiating both bodily and psychic factors including that of cognition, find an indispensable role in the pathology of mild cognitive impairment. Knowledge of other factors involved and associated in the cognitive process can enrich its scientific understanding in the clinical scenario.

Keywords: Mild cognitive impairment, tridosha, factors in cognition

INTRODUCTION

Advancing age is associated with changes in cognitive abilities. Dementia, which is considered as the pathological extremity of cognitive impairment is one of the major factors causing mortality and dependency among older adults. Pathological changes of chronic diseases, especially neurodegenerative diseases, must be viewed with utmost care. Many of these diseases pass through a very slow pathological process which comprises mild, moderate and severe stages. Among these, the mild stages may pass unnoticed more often than not. Failure to recognize this stage can lead to progressive disability from a treatable and reversible situation in many cases[1]. Mild cognitive impairment (MCI) is defined as a condition which causes a slight, but noticeable and measurable decline in cognitive abilities including memory and thinking skills. This condition is distinct from age-associated cognitive decline and dementia; if normal aging and dementia are seen as the two extreme ends of a continuum, an area of transition has been identified which may progress to dementia. The term most often used nowadays for this transitional phase is MCI[2]. The influence of tridosha from the initiation to the establishment of both physical and psychological diseases is well understood[3]. The different factors involved and associated in the process of cognition are identified in Ayurveda. Knowledge of the influence of vitiated doshas on each factor can help in the understanding of MCI and the establishment of timely preventive and treatment protocol for MCI.

Cognitive Impairment

Cognition is defined as the mental action or process of acquiring knowledge and understanding through thought, experience and senses. Cognitive impairment is the condition when a person has trouble in remembering, learning new things, concentrating, or making decisions that affect their everyday life. Cognitive impairment ranges from mild to severe. With mild impairment, people may begin to notice changes in cognitive functions, but still be able to do their everyday activities. Severe levels of impairment can lead to losing the ability to understand the meaning or importance of something and the ability to talk or write, resulting in the inability to live independently[2].

Mild Cognitive Impairment

Mild cognitive impairment (MCI) is sometimes considered to be a precursor of dementia or as the boundary between normal aging and dementia. MCI is a construct usually used to define groups of people who may be at the risk of developing Dementia, crucial for targeting preventive interventions[1].

Diagnostic Criteria of MCI

- The person is neither normal nor demented
- The person experiences cognitive decline more than expected for the age.
- There is evidence of cognitive deterioration shown by either objectively measured decline over time and/or a subjective report of decline by self-and/or informant in conjunction with objective cognitive deficits
- Activities of daily living are preserved, and complex instrumental functions are either intact or minimally impaired[1]

Tridosha Perspective on Cognition

Ayurveda, the traditional medical system of India, has delineated three categories of fundamental regulatory principles of the body, mind, and behavior. These three categories, called doshas, are named Vata, Pitta, and Kapha. Tridosha are the qualitative functional units of the body and are responsible for both health and disease in their balanced and unbalanced states, respectively. Along with tissues and metabolic wastes, they maintain the physical, physiological, psychological and behavioral functions[3].

Cognitive Functions of Vata

Vata dosha is regarded as the major factor responsible for cognitive functioning with due support from pitta and kapha. Vata is the factor responsible for each and every activity occurring at mental or physical level in the body. In general, vata sustains the body with utsaha (enthusiasm) and indriya patavam (sharpness of sense organs). Among the five functional types of vata dosha, Prana vata helps to maintain buddhi (discrimination), indriya (sense organs) and manas (mind)[4]. The functions of Udana vata which are predominant in cognition are also described in different texts. The major function of Udana vata according to all the Brihat Trayees is related to speech. It is also involved in providing strength, valor, complexion and courage. Memory, the awakening of the mind and nourishing the tissue pores are also attributed to it[5].

The functions attributed to Prana vata and Udana vata shows that cognition which is a psychological process is initiated by a healthy interaction between sense organs, mind and different neural networks responsible for discriminative power, energy, courage and memory. The other measurable factors associated with cognitive skills are Bala (strength), Varna (complexion), pravarthi (activities) and oorja (energy)[6]. Any error in this system network due to defective functioning of Prana and Udana vata can result in the cognitive impairment which may range from mild to severe.

Cognitive Functions of Pitta

Pitta in general sustains the body with Buddhi (discrimination), Medha (intelligence) and Shaurya (valor). From the functional classification of Pitta dosha, Sadhaka pitta which resides in Hridaya helps in functions such as Buddhi (discrimination), Medha (intelligence), Abhimana (pride) and utsaha (enthusiasm)[7]. Pitta dosha by virtue of its potent qualities like tikshna, ushna and laghu sharpens the cognitive process especially that of buddhi, Medha and utsaha[8].

Cognitive Functions of Kapha

Kapha in general sustains the body with Kshama (forbearance), Dhee (discrimination), and Dhriti (courage)[9]. Tarpaka kapha, a type of Kapha nourishes the sense organs in the head[10]. The maintenance and sustainability of the cognitive process are attributed to Kapha dosha. In nutshell the different functions of doshas determining cognitive process can be depicted as follows

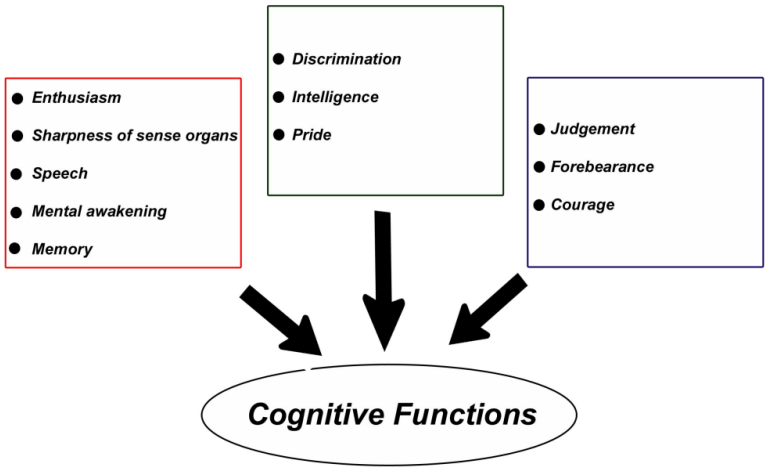

Figure 1: Cognitive Determinants

Tridosha in Cognitive Impairment

The effect of tridosha on the different factors involved in cognition can be studied based on the features of their vridhi and kshaya. The table explains the effect of vitiated tridosha on factors involved and associated with cognition.

Table 1: Effect of vitiated tridosha on cognitive factors

Factors involved and associated in cognition	Vata	Pitta	Kapha
Indriya	Non/low functioning	Weakness	Low perception
Manas	Fearful	Fatigue	Laziness
Dhee	Loss of discrimination	confused	confused
Dhriti	Coward	Daring	Ignorant
Smriti	Loss of memory	Disturbed memory	Disturbed memory
Bala	Loss of strength	weakness	Laxity of muscles
Varna	Blackish discoloration	Loss of luster, yellowish discoloration	Whitish discoloration
Vak pravriti	Incoherent speech	Intolerant speech	sluggish speech
Pravriti	Irrelevant or repeated activities	Hyperactivity	Sluggish activities

From the table, we can identify the effect doshas in the functioning of Indriya or sense organs, Manas or mind and Buddhi or different functional areas of intelligence. The effective communication of indriya, manas and buddhi in their healthy state helps in the normal perception, processing and understanding of information which can result in the normal

response from a person as expected to his age[11]. In short, cognitive functioning relies on the functional integrity of tridosha and manas and the structural and functional integrity of sense organs. Perfect interaction among these determines the cognitive functioning of an individual.

Since the doshas involved in cognition are also related to Bala and Varna, these factors should be assessed in cognitive impairment. Bala and Varna are indicators of dhatu sarata or excellence of tissues[12]. Bahu doshavastha described in Charaka Samhita, dhatu Shaithilya which is evident in Pandu and prameha, dhatu kshaya avastha in Rajayakshma are associated with deteriorative changes in Bala and Varna. So, it is very probable that changes in cognitive ability from mild to severe can be measured in terms of respective changes in Bala and Varna.

Common Factors Involved in the Disease Pathology

The disease is the effect of dosha dushya sammurchana, which is regarded as the asamavayi karana of any disease. Metabolic dysfunction, waste metabolites and deranged tissue channels also play an important role in disease causation. Vitiated doshas are the inseparable causes of disease and occupy prime importance as they are solely responsible for the vitiation of all other factors involved in the disease pathology[13]. So, estimation of these factors – dosha, dhatu, mala, srotas and Agni – based on clinical estimation are essential to understand the different stages of the disease.

Vata is the prime dosha involved in cognition[14]. The normal activities of Vata dosha could occur only on the homeostatic condition of other doshas and dhatus. The disturbance in the equilibrium of these factors could hinder the usual functions of vata. Vata dosha attains Prakupita state either by Avarana or Dhatukshaya[15]. Both these states are regarded as conditions that have a bad prognosis or not easy to treat. Before attaining these states, any disease might have gone through different stages influenced by the functional status of Agni, both structural and functional status of srotas and dhatus. Identification of these stages is crucial as early intervention could reverse the disease pathology or delay the appearance of the full-blown disease.

Pathological Concept of Mild Cognitive Impairment

In Mild cognitive impairment, the pathology usually occurs after the middle age. As MCI is distinct from age-associated cognitive decline, a different etiology and pathology has to be framed and a management protocol designed accordingly[2].

The cognitive domains described in Ayurveda are Manas, Buddhi, Samjna, Smriti, Bhakti, Seela, Chesta and Achara. Unmada (psychiatric illness) is defined as the disease affecting cognitive domains which results in the perversion of mind, discriminative power, recognition, memory, preference, behavior, action and conduct[16]. In MCI, some of these domains are affected to a lesser degree without causing any functional impairment to the affected individual; so more or less the etiological factors for Unmada can be considered causing disturbance to tridosha, thus leading to MCI pathology. The causative factors include contradictory foods, accumulative toxins, unhygienic foods, mental trauma and improper activities like day sleep, night awakening, less social interactions, and lack of exercise[17]. These causative factors vitiate tridosha and make Agni of manda quality. This in turn vitiates rasa dhatu which insidiously results in the vitiation of Rasavaha srotas, manovaha srotas and Hridaya. The mental predisposition of the affected individual determines the progression of pathology. The same pathology affecting cognitive domains is evident in chronic disease involving the vitiation of Tridoshas like Pandu, Prameha and Rajayakshma. Clinical features of MCI can manifest according to site of vitiation i.e.; on the abode of a dosha (Chaya stage) or when a vitiated dosha spread to the seat of another dosha (prakopa stage) or when vitiated dosha interact with the seat of cognitive domains i.e.; Hridaya (sthana Samshraya stage).

Management Strategy of Mild Cognitive Impairment

Mild cognitive impairment can be regarded as a clinical entity that has a higher probability to change into any type of Dementia. Advances in MCI will be paramount for the early detection and treatment of Alzheimer's disease. Experts agree that disease-modifying treatments for Alzheimer's disease will focus on cognitively intact individuals at increased risk[1]. According to different research studies, mild cognitive impairment which is heterogeneous in nature can revert to normal in some subjects or continue as MCI itself in some subjects or develop into different forms of dementia in others. Based on these observations, Mild cognitive impairment can be considered as a stage which is Reversible (Sadhya/curable) or Sustain a similar status for a long period (Yapya/manageable) or Develop into any form of Dementia (Asadhya/incurable).

Reversible (Sadhya)

The disease in its reversible condition mainly shows the active stage of tridosha in mild, moderate, or excess forms mainly on their abodes i.e. Koshta. This can be Koshta asrita stage. Accordingly, treatments like langhana, langhana-pachana, and shodhana or more precisely dosha pratyanika treatments are advised[18]. Normally these treatment options are suitable for the Sama dosha (acute form) and Bahu dosha (excess amount) stages of any disease. So, the first stage of MCI can be considered to have the features seen in Ama avastha and Bahu dosha avastha.

Sustaining stage (Yapya)

This can be considered as the Dhatugata stage. Here, the spreading, accumulation, and interaction of dosha with Hridaya (seat of cognitive domains) are taken into consideration. The vitiated doshas by means different etiologies like performing wrong activities etc and excess movement of Vata will migrate and accumulate in tissues from its abode[19]. The resultant dosha dushya interaction will make pathological changes in the rasa dhatu. This will make the disease condition chronic. In such chronic or sustaining disease conditions, Ayurveda advises not to use any immediate action protocol focused on modifying morbid dosha intended for the reversal of the condition which is of limited use. If the condition is sustaining and is not responding to dosha specific treatment protocols, then either usage of vyadhi Samana prayoga (disease palliative therapy) or rasayana prayoga (disease modification therapy) and the elimination of the morbid dosha accumulated in the tissue which is participating in the pathology at appropriate times are the better options[20]. The vyadhi Samana prayoga can be selected logically based on associated chronic medical conditions. The rasayana Prayogas which help to correct buddhi and smriti along with correction of associated factors like varna, bala, etc (e.g.; Triphala rasayana, Medhya rasayana)[21] could give better results.

DISCUSSION

Cognition is the mental action or process of acquiring knowledge through thought, experience and senses which involves the sound functioning of indriya, manas and buddhi. Defects at these levels

of integration may result in impaired cognition which ranges from mild to severe forms. The functional elements called Tridoshas regulate the functioning of these triads. While Prana vata helps in the perception and retention of information, Udana vata helps to memorize, speech and other activities in response to the processed information. Motor activities rely on Vyana vata. Sadhaka pitta assists manas and buddhi in the act of information processing while Bodhaka kapha helps in discrimination and judgment. The doshas can be vitiated either its own reasons or due to defect in indriya, manas and buddhi. Identification of this Somato-psychic and psycho-somatic perspective and also the system pathology help to frame a logical treatment plan. Adequate differentiation requires an understanding of mind/body connection which includes the knowledge of general medicine, psychiatry and the systems linking the body and brain. MCI is a co-morbid condition of a medical disease or emotional disorder that itself differentiates it from age-associated cognitive decline (AACD) which is non-pathological or not associated with medical conditions. Psychological co-morbid MCI shares the features of amnestic MCI and has a greater chance to convert into Alzheimer's dementia. Vascular MCI associated with medical conditions is non-amnestic and less chance to convert into AD[1]. Hence identification of MCI type is of paramount importance. The knowledge of factors directly involved and associated in cognition as per Ayurvedic treatises needs special attention. The assessment of Varna and Bala as a tool can help to recognize Bahu Dosha, Dhatu Shaithilya and Dhatu kshaya stages which indicate the different stages of cognitive impairment from mild to severe. This pattern of dosha dhatu involvement is evident in medical conditions like Pandu, Prameha and Rajayakshma needs future studies. Designing treatment protocol looking into vitiating factors, stages, and abodes of doshas with due consideration of indriya, manas and buddhi help in the reversal of curable MCI.

CONCLUSION

This article has tried to convey the importance of tridosha in the etiology, pathology, and clinical manifestation of MCI and to frame treatments protocols considering different factors involved and associated with the cognitive process. Assessment of Varna and Bala also has to be implemented in routine practice which helps the practitioner to predict the prognosis of MCI which has variable outcomes.

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