Original Article

Effect of nutritional status on the cognitive function in elderly people residing in vicinity of Islamabad

Sadaf Jafar, Sadaf Hasan, Abrar Hussain Azad, Qurat-Ul-Ain Zia

Departments of Biochemistry, Physiology and Community Medicine, Islamabad Medical and Dental College (IMDC), Baharia University, Islamabad, Pakistan

Objective: To assess the effect of nutritional status on the cognitive function of individuals 60 years or above living in Islamabad and its vicinity.

Methodology: This cross sectional study was carried out at Islamabad Medical and Dental College, Islamabad, from February 1, to May 1, 2014 and included 100 individuals having age 60 years or above using convenience sampling. Nutritional status was assessed by using Mini Nutritional Assessment (MNA) Questionnaire and cognitive function was assessed by using Mini Mental State Examination (MMSE). Data were analyzed using SPSS version 16.00.

Results: Out of 100 participants, 50 were males and 50 females. It was found that the nutritional status of an individual did not affect the cognition, irrespective of age. The effect of nutritional status on cognitive function was insignificant ($p>0.05$).

Conclusion: We found that nutritional status of an individual did not affect the cognition, irrespective of age. The diet and awareness should be given importance regarding health, physical as well as mental. (Rawal Med J 2014; 39:399-402).

Key words: Nutritional status, Mini Nutritional Assessment (MNA), Mini Mental State Examination (MMSE).

INTRODUCTION

Mood fluctuations may be evident, during the period of fasting and starvation which is mostly irascible.[1] Vitamins and minerals deficiency can affect the nerves, causing disruption in thought process and sleep patterns, which influence the efficiency of brain. There are different socio-economic factors, which have an impact on mental health, like self-care and financial status.[2]

People from low socio-economic status often show poor cognition irrespective of better diet given during years of adolescense.[3] Certain diseases are due to nutritional deficiencies. Patients with attention deficient hyperactivity disorder commonly show decreased fatty acids and iron levels.[4] The eating habits can coordinate with the help of circuits of neurons between the gut and brain and release of hormones.[5]

Brain is the most vital organ and its requirement for oxygen and nutrients is round the clock. Neurotoxic and carcinogenic components of vaccines are even damaging to the brain leading to myalgia, allergies, asthma, diabetes, seizures, Guillain-Barre syndrome, attention deficit hyperactivity disorder, autism and Alzheimer disease.[6] By eating healthy food containing good protein, polyunsaturated fatty acids, fresh vegetables and fruit, many of the diseases which are related to neurotransmitter imbalance can be prevented.[7] Omega-3 is helpful in psychosis but it may take several weeks to have pronounced effect and has been used in prevention of cardiovascular diseases.[8] Calcium, zinc and copper supplementation improves mood.[9]

Mediterranean diet is recommended for good and efficient brain function.[10] The aim of this study was to assess the effect of nutritional status on the cognitive function of individuals 60 years or above living in Islamabad area.

METHODOLOGY

This cross-sectional study was approved by Institutional Review Board (IRB) of Islamabad Medical and Dental College, Islamabad, Pakistan. It was conducted during February to May 2014. 100 subjects with age 60years or above were selected by using convenience sampling technique from vicinity of Islamabad. Verbal consent was obtained from each participant who completed the questionnaire regarding MNA and MMSE tools, supervised by doctor to assist the participants.

MNA consists of 6 questions and scores for each answer range from 0 to 3. The final score was calculated, with score 12-14 indicative of normal nutritional status, scores 8-11 at risk of malnutrition and scores between 0-7 indicate malnutrition. MMSE consists of 12 questions and scores for each answer range from 0-5. The final score was calculated with score 8-11 indicative of moderate cognitive impairment, 19-26 mild cognitive impairment and 27 or above indicative of normal cognition. Data were analyzed using SPSS v. 16. Frequency measures were performed and Pearson Chi- Square was applied. A <0.05 was considered statistically significant.

RESULTS

Out of 100 participants, 50 were female and 50 were male with age ranging from 60-70 years. 50% belonged to urban area and 50% to rural area. Education status was that 10% were illiterate, 60% were matriculate and 30% were graduate. 15% showed normal nutritional status. 49% revealed to be malnourished were 49% and 36% were at the risk of malnutrition (Table 1).

Table 1. Nutritional status on the basis of Mini Nutritional Assessment.

MNA	Number	Percent
Normal Nutritional status	15	15.0
At risk of malnutrition	36	36.0
Malnourished	49	49.0
Total	100	100.0

Table 2. Nutritional status on the basis of Mini Mental State Examination.

MMSE	Number	Percent
Sever Impairment	7	7.0
Moderate Impairment	17	17.0
Mild Impairment	46	46.0
Normal Cognition	30	30.0
Total	100	100.0

Table 3. Association of Mini Nutritional Assessment with Mini Mental State examination.

		Mini mental state examination				Total	P-value
		Severe Impairment	Moderate Impairment	Mild Impairment	Normal Cognition		
Mini Nutritional Assessment	Normal Nutritional status	0	4	8	3	15	0.160
	At risk of malnutrition	2	2	17	15	36	
	Malnourished	5	11	21	12	49	
Total		7	17	46	30	100	

P>0.05 is insignificant

46 of malnourished patient showed mild impairment. 17 subjects who were at the risk of malnutrition, also revealed mild impairment in cognition. Normal nutritional status was found in 30 subjects and they had normal cognition (Table 2). The effect of nutritional status on cognitive function was insignificant with p>0.05 (Table 3).

DISCUSSION

If proper management and therapeutic measures are taken as soon as possible, the deterioration of cognition can be prevented.[11] Dementia evaluation for patients above 60 with impaired cognitive function is beneficial for the patient as well as for care giver. In our study, the patients who were suffering from mild to severe dementia were screened and they were given proper advice.[12] Previously published quality indices state that all vulnerable elders around 65 years who are at risk for death or functional decline should be evaluated

annually for cognitive and functional status.[13] The screening techniques are not satisfactory for illiterate elders with low education. There was lot of effort to clarify the details for illiterate candidates because in Pakistan, illiteracy is the major dilemma associated with disease burden.[14]

As a result of aging, there is increase in monoamine oxidase, which is required for breakdown of catecholamine and decrease in nor epinephrine and dopamine. Person shows decrease response to any stimulus, thoughts and actions are less flexible, effortful memory tasks are slowly performed. These aging and deteriorating changes are delayed if proper nutrition is maintained.[15]

Certain dietary supplements are required to improve the symptoms. Most of the candidates were positive for malnutrition or they were the borderline cases. These individuals can improve the nutritional status by proper awareness and counseling. Vitamin supplements have been designed for the elderly patients keeping in view of their requirement, body demands, neurotransmitter levels and xenobiotic metabolism.[16]

Memory neurotransmitter acetylcholine is enhanced by certain food products such as apple juice and saffron. Estrogens protect the nerve cells and improve the neuronal signaling, synaptic activity and mitochondrial function of brain cells is preserved.[17] Candidates were advised quality food with nutritional value. It is very essential to mention the foods, which improve the cognition. These are apple juice, blue berries, spinach, strawberries, green tea, plum juice, grape juice, grape seed extract, almonds, walnut, Mediterranean diet, vitamin B complex, amino acids, fish oil and cinnamon.[18] The microglial brain cells heal up after oxidative stress, which is due to free radicals. The repair speeds up by adding brain tonics containing fruit, especially blue berry extracts. The inflammatory changes of brain can also subside by using food of nutritional value.[19,20]

In America, 5,947 male physicians having 65 years of age were given multivitamins for 12 years and it was found that there was no effect of multivitamins on cognition in well educated elderly people, with good nutritional status.[21] Similar to our study, when the educated group was assessed, as they had good cognition along with the good nutritional status. Education and awareness has a major role on quality of life. The western world is provided with better education system and more facilities enjoys better health and cognition as compared to developing countries like Pakistan.

In present study, cognition was well established in educated and people who belonged to higher social status as compared to poor, irrespective of nutritional status. However, indirect relationship is there because naturally people with good financial status consume better diet.[22]

Mediterranean diet is associated with better cognition but not in very elderly women.[23]

CONCLUSION

We conclude that the subjects with better nutritional status did not have better cognition, irrespective of age. In subjects above 70years, cognition was mildly impaired due to less emphasis on the nutritional status and the quality care. Thus, early detection of dementia, timely management, proper use of vitamins, minerals and medication if required can delay future cognitive deficit.

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Author contributions:
Conception and design: Sadaf Jafar
Collection and assembly of data: Sadaf Jafar, Sadaf Hasan
Analysis and interpretation of the data: chief research officer and statistician
Drafting of the article: Sadaf Jafar
Critical revision of the article for important intellectual content: Sajid Raza, Prof. and Head of Biochemistry Department, Islamabad Medical and Dental College.
Statistical expertise: Mohammad Afzal.
Final approval and guarantor of the article: Sajid Raza
Corresponding author email: Sadafjafar75@gmail.com
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