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Research Article

A Comparative Study on Nutritional Status, Functional Status and Quality of Life between Dementia Patients and Healthy Individuals in Kolkata, West Bengal

Soumam Dutta[1], Sanchari Roy[2], Sohini Roy[3], Ananta Manna[4]

[1]Department of Food and Nutrition, Vidyasagar College, Kolkata, West Bengal, India.
[2,4]Department of Psychiatry, Calcutta National Medical College & Hospital, Kolkata, West Bengal, India.
[3]Department of Food and Nutrition, Women's College, Calcutta, Kolkata, West Bengal, India.
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I N F O

Corresponding Author:
Sohini Roy, Department of Food and Nutrition, Women's College, Calcutta, Kolkata, West Bengal, India.
E-mail Id:
sohini.roy@womenscollegekolkata.ac.in
Orcid Id:
https://orcid.org/0000-0002-5262-6019
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A B S T R A C T

Introduction: Dementia patients may have an increased risk of developing malnutrition, due to inadequate food intake and inferior dietary quality. Furthermore, functional impairment may worsen the situation by limiting the ability to self-feed. It may ultimately lead to a decrease in quality of life and an increase in caregiver burden. Therefore, the current study aims to assess the nutritional status (NS), functional status (FS) and quality of life (QoL) of dementia patients and compare them with those of healthy individuals.

Methodology: Dementia patitents (n = 60) and healthy subjects (n = 60) of similar sociodemographic profiles were recruited. Validated tools were used for the screening and assessment of dementia, NS, FS and QoL.

Results: A significant ($p < 0.001$) impairment of NS, FS and QoL was observed among dementia patients. The patients were found to consume a lesser number of meals and had difficulties in self-feeding. Also, the patients perceived themselves to be unwell/ unhealthy.

Conclusion: Overall, dementia patients faced higher degrees of malnutrition and functional impairment and had lower quality of life than healthy individuals. Routine screening and targeted interventions will be beneficial for such patients.

Keywords: Dementia, Malnutrition, Self-Feeding, Quality of Life

Introduction

Dementia is a condition characterised by a gradual decline in cognitive functions, resulting in an impairment of functional abilities.[1] In 2013, approximately 44 million people worldwide lived with dementia, with numbers affected doubling every 20 years, to reach approximately 135 million by 2050.[2,3] The aetiology of dementia is multifactorial, which involves a complex interaction between numerous biological and environmental factors. Nutritional status (NS) is one such factor which is found to be associated with dementia and the condition worsens with the progression of disease.[4] In fact, malnutrition can be commonly observed in the geriatric population owing to several reasons like

loss of appetite, faulty eating behaviours and disruption of central regulation of eating and metabolism.[5] Although, it is difficult to comprehend whether malnutrition is a cause or consequence of dementia. Thus, the assessment of NS among the geriatric population and its correlates has gained popularity among researchers. Furthermore, individuals with dementia are found to have impaired functional status (FS) which interferes with independent living and increases caregiver burden.[6] This is particularly problematic in resource-poor settings, where a lack of awareness among caregivers may further complicate the situation. All these factors together may lead to a deterioration of the quality of life (QoL) of the individuals with dementia.

In India, most of the nutrition programmes target infants, children, adolescents, and pregnant and lactating mothers, even though malnutrition and frailty can be commonly seen in the elderly age group. Therefore, the availability of data on NS of elderly subjects is limited, especially among clinical populations. Particularly, information on the NS of dementia patients is scarce. Therefore, the present study was designed to assess the NS of dementia patients attending two tertiary hospitals in Kolkata, India and compare their status with apparently healthy individuals. Additionally, we intend to evaluate their FS and QoL for a better understanding of their overall health status.

Methodology

The study protocol has been published elsewhere.[7] Briefly, a cross-sectional study was conducted between May, 2018 to June, 2018; with dementia patients (n = 60) and apparently healthy subjects (n = 60) of comparable sociodemographic profiles. The subjects were randomly selected from the outpatient clinics of two tertiary hospitals (Calcutta National Medical College and Hospital and Baruipur Superspeciality Hospital) in Kolkata, West Bengal, India. Two experienced psychiatrists diagnosed the subjects with dementia, following the International Classification of Diseases (ICD)-10 criteria.[8] Severity of dementia was assessed using the Mini Mental Status Examination (MMSE) tool.[9] Subjects of age ≥ 60 years with confirmed dementia, were included in the study. The non-blood relatives or friends of the patients identified by the caregivers were chosen as control and were invited to participate in the study during the follow-up visit. The inclusion criteria for the control group were age ≥ 60 years, MMSE Score ≥ 27 and absence of any psychiatric morbidity. Subjects suffering from any acute illness, uncontrolled diabetes or metabolic syndrome were excluded from both groups. All the participants and/ or caregivers signed informed consent before the initiation of the study. A pre-designed, pre-tested, semi-structured questionnaire was used for collecting socio-demographic data. Socio-economic status was assessed using the Modified Kuppuswamy Scale.[10]

Nutritional Status Assessment

Mini Nutritional Assessment (MNA) tool was used to assess the NS.[11] MNA is a validated tool for screening and assessment of NS, suitable for identifying elderly subjects who are malnourished or at risk of malnutrition. It has 18 items and classifies one as normally nourished, at risk of malnutrition or malnourished. The guidelines for conducting MNA were followed accordingly.

Functional Status Assessment

Physical Self Maintenance Scale (Activities of Daily Living Scale or, ADLs) and the Instrumental Activities of Daily Living (IADL) Scale were used for assessing the FS.[12] ADL is a 6-item tool which represents basic activities essential for survival, whereas IADL is an 8-item tool representing complex activities that are required for independent living.

Quality of Life Assessment

36-Item Short Form Health Survey (SF-36) tool was used to assess QoL.[13] It is a validated tool and suitable for use in persons with dementia.[14] It consists of 36 questions and measures QoL in nine domains. The patient perspectives were recorded. If not available, patient-proxy perspectives were considered.

Statistical Analysis

Data analysis was performed using MS Excel (2010) and SPSS (Version 21.0). The normality of continuous variables was analysed using KS-test and SW-test. Data are expressed as mean ± SD or median (IQR) or frequencies. Student's t-test or Mann-Whitney U-Test was used to analyse the difference between cases and controls. Chi-square test was used to analyse categorical data. Two-sided $p < 0.05$ was considered to be statistically significant.

Ethical Approval

The study protocol and procedures were approved by the Institutional Ethical Committee of CNMC&H, Kolkata, India.

Results

A total of 60 dementia patients and 60 apparently healthy subjects participated in the study. The general characteristics of the participants have been published elsewhere,[7] and are summarised in Table 1. Both the groups had a similar profile ($p > 0.05$) and hence ensured comparability. Figure 1 represents the severity of cognitive impairment among dementia patients.

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Table 1.General Characteristics of the Participants

General Characteristics	Dementia (n = 60)	Healthy Subjects (n = 60)	p Value
Age in years (mean ± SD)	65.5 ± 5.9	64.0 ± 5.0	0.12
Sex (male) n (%)	28 (46.7)	31 (51.7)	0.58
Socioeconomic status n (%)			
Middle-income group	19 (31.7)	17 (28.3)	0.91
Lower-income group	41 (68.3)	43 (71.7)	
Educational status n (%)			
Full schooling	8 (13.3)	6 (10.0)	0.88
Secondary schooling	18 (30.0)	23 (38.3)	
Primary schooling	9 (15.0)	7 (11.7)	
No schooling	25 (41.7)	24 (40.0)	
Residence (rural) n (%)	45 (75.0)	47 (78.3)	0.66

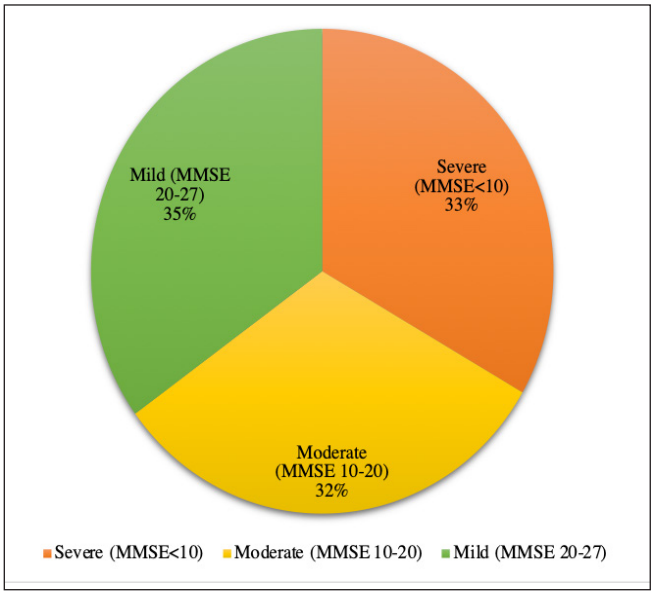

Figure 1.Frequency Distribution of Severity of Dementia

The prevalence of malnutrition, risk of malnutrition and normal NS among the participants, according to the MNA tool, is presented in Table 2. The prevalence of malnutrition was significantly higher ($p < 0.001$) in the dementia group. Analysis of MNA items revealed that 28.1% and 17.2% of the dementia patients encountered a weight loss of more than 3 kg and between 1 and 3 kg, respectively during the past three months, whereas only 6.3% of the controls encountered weight loss between 1 and 3 kg ($p < 0.001$). 38.3% and 33.3% of the dementia patients encountered a severe and a moderate decrease in food intake, respectively during the past three months of the study, whereas only 15.0% of the healthy subjects encountered a moderate decrease in food intake ($p < 0.001$). 13.0% of the dementia cases were unable to eat without assistance, and 33.0% were self-fed with some difficulty. On the other hand, all the controls were self-fed without any problem.

Table 2.Nutritional Status of Participants Assessed by MNA Tool

Nutritional Status	Dementia (n = 60)	Healthy Subjects (n = 60)	p Value
Malnourished n (%)	45 (75.0)	2 (3.3)	< 0.001*
At risk of malnutrition n (%)	15 (25.0)	8 (13.3)	
Normal nutritional status n (%)	0 (0)	50 (83.3)	

*Data significant at 0.1% level

Furthermore, we observed a significant ($p < 0.001$) impairment of ADL and instrumental activities (IADL) among dementia patients, indicative of a declined FS (Table 3).

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Table 3.Functional Status of Participants

Functional Status	Score Ranges	Dementia (n = 60)	Controls (n = 60)	p Value
Activities of Daily Living (ADL) n (%)	Mild/ no limitations (5–6)	17 (28.3)	56 (93.3)	< 0.001*
	Moderate limitations (3–4)	15 (25.0)	4 (6.7)	
	Severe limitations (0–2)	28 (46.7)	0 (0.0)	
Instrumental Activities of Daily Living (IADL) n (%)	No limitations (7–8)	4 (6.7)	52 (86.7)	< 0.001*
	Mild limitations (5–6)	8 (13.3)	6 (10.0)	
	Moderate limitations (3–4)	9 (15.0)	2 (3.3)	
	Severe limitations (0–2)	39 (65.0)	0 (0.0)	

*Data significant at 0.1% level

Table 4.Quality of Life Scores of Participants in Various Domains

SF-36 Domains	Dementia (n = 60)	Healthy Subjects (n = 60)	p Value
Physical functioning	15.0 (16.3)	77.5 (15.0)	< 0.001*
Role limitation due to physical health	50.0 (25.0)	75.0 (25.0)	< 0.001*
Role limitation due to emotional problems	33.3 (0.0)	100.0 (33.4)	< 0.001*
Energy/ fatigue	20.0 (25.0)	75.0 (25.0)	< 0.001*
Emotional well-being	20.0 (12.0)	76.0 (24.0)	< 0.001*
Social functioning	37.5 (25.0)	75.0 (25.0)	< 0.001*
Pain	45.0 (22.5)	77.5 (22.5)	< 0.001*
General health	25.0 (15.0)	77.5 (25.0)	< 0.001*
Health change	25.0 (25.0)	75.0 (25.0)	< 0.001*

Data expressed as Median (IQR), *Data significant at 0.1% level

We also observed a significant ($p < 0.001$) impairment of QoL among dementia patients, across all domains of SF-36 (Table 4). Overall, the dementia patients perceived themselves to be unwell/ unhealthy.

Discussion

In the present study, we observed a significant impairment of NS, FS and QoL in dementia patients as compared to healthy individuals. Earlier studies have found a significant association between dementia and malnutrition, and dementia is found to act as an independent predictor of NS in the elderly population.[4,15–17] The higher prevalence of malnutrition, as observed in dementia patients, could be due to multiple reasons. The dietary intake analysis of the same population revealed that the dementia patients had a significantly lower intake of calories, macronutrients and micronutrients as compared to the healthy subjects.[7] This may be supported by the fact that dementia patients had a lower food intake as compared to healthy subjects. Possibly, an impairment of central regulation of eating and metabolism has contributed to the lower food intake as observed in dementia.[18] Furthermore, a significantly lower dietary diversity score has been observed among individuals with dementia, indicative of poor dietary quality,[7] which may further impair NS. However, the NS of dementia patients can be improved with suitable dietary interventions. Therefore, lack of awareness among caregivers and/ or ignorance could be another possible reason behind the nutritional impairment of this population. Additionally, we found that a significant proportion of dementia patients had difficulty in self-feeding and/ or required assistance while eating. Probably, an impairment of FS might have been responsible for this. Therefore, we intended to check the degree of functional impairment among dementia patients. Indeed, dementia patients had a higher functional impairment (ADL and IADL) than healthy individuals. The impairment was more pronounced in IADL since it requires a higher level of cognitive performance (e.g., the ability to

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use the telephone, manage finances, be responsible for own medications, shopping, housekeeping etc). Finally, we observed that the QoL score of dementia patients was significantly lower than that of healthy individuals in all domains. The dementia patients had impaired physical, emotional and social well-being; experienced higher degrees of fatigue and pain; and perceived themselves as unhealthy. Earlier it has been observed that the determinants of QoL in dementia patients are very complex, and may depend on factors like cognitive impairment, functional impairment, behavioural and psychological disturbances (e.g., depression, anxiety, irritability etc).[19,20] In the present study, dementia patients, with impaired NS and FS, may have faced numerous physical, emotional, domestic and social challenges in daily life, which probably led to a decreased QoL.

However, we could not establish any causal relationship between NS, FS and QoL in dementia patients, which is a limitation of this study. Therefore, further studies with larger sample sizes are warranted and suitable interventions should be identified. NS of dementia patients can be improved by routine nutritional screening and anthropometric, biochemical, clinical and dietary assessments. Prescribing oral nutritional supplements and improving dietary diversity may further help to address numerous nutritional challenges faced by these patients. Certain functional foods like Brahmi, Ashwagandha, turmeric, garlic, and pumpkin seeds are found to have mental health-promoting properties and thus can be incorporated into the diet.[21] Cognitive stimulation interventions may be useful in improving the cognitive performance of dementia patients. Physical activity, exercise and occupational therapy interventions may be helpful in improving FS, whereas, behavioural therapy, psychosocial interventions and early-stage support groups may improve the QoL of dementia patients.[22] Moreover, awareness should be generated among caregivers so that they can provide the necessary facilities to individuals having dementia.

Conclusion

In the present study, we observed that nutritional status, functional status and quality of life of elderly dementia patients were significantly impaired as compared to healthy individuals. Routine screening for such impairments will be helpful in identifying the at-risk population. Moreover, targeted interventions will be beneficial to reverse the condition, and promote the nutritional and overall well-being of these patients.

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