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Association of Geriatric Syndromes with Malnutrition Among Elderly

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ABSTRACT

Background: *Malnutrition is a serious and frequent condition among older adults. However, older adults are poorly assessed for malnutrition although it is not an uncommon problem in this population. Age related decline in food intake, is associated with various psychological, physiological, and social problems.* ***Aims:*** *The study was aimed to conduct more comprehensive nutritional assessment tests among malnourished and among normal elders to assess other geriatric syndromes and to investigate the association of geriatric syndromes with malnutrition.* ***Methods and Material:*** *An earlier community survey was conducted at the urban field practice area of PSG Institute of Medical Sciences and Research, Coimbatore on 154 households and 190 elders aged 60 years and above were interviewed. Malnutrition was assessed using mini nutritional assessment test (MNA) in which 37 were found to be malnourished, 47 were found to be at risk of malnutrition and 106 were found to be normal. The present cross sectional study included 30 malnourished elders and 30 normal elders randomly selected from this population. The geriatric syndromes were assessed and compared between malnourished and normal.* ***Results:*** *It was observed that, the presence of visual disturbances (86.71% vs. 53.3% x^2=7.937, P<0.01), dizziness, (60.0% vs. 16.7% x^2=7.937, P<0.01), hearing loss (40.0% vs. 10.0% x^2=7.200, P<0.01), dementia, (30.01% vs. 3.3% x^2=7.680, P<0.01) and depression (60.0% vs.13.8% x^2=13.464, P<0.01) were significantly higher in malnourished compared to normal elderly. The functional dependence mean + standard deviation (for GUGT (2.16+0.83 vs. 1.36+0.49 t=4.530 P<0.001 and Barthel index (83.50+12.18 vs. 90.66+6.91 t=2.801 P<0.01) were also significantly different between malnourished and normal elderly.* ***Conclusion:*** *The presence of various geriatric syndromes was significantly higher in malnourished elderly compared to normal. Thus, the interventional programs for malnutrition among elderly should also identify and address their geriatric syndromes.*

Keywords: Barthel index, elderly, geriatric syndrome, malnutrition

INTRODUCTION

Malnutrition is a serious and frequent condition among older adults [1]. The ageing process is a biological reality which has its own dynamic, largely beyond human control. However, it is also subject to the constructions by which each society make sense of old age. Aging is presumed to be process starting from infancy and continuing until death. On the other hand, being elderly is an unpreventable process that has biological, chronological, and social aspects and problems. Aging is a multidimensional change involving the physical, psychological as well as social aspects for an individual. It can be described as a progressive deterioration of the physical and mental functions resulting in a simultaneous decline in both the capacity of the body to maintain homeostatic balance as well as the adaptability of the individual to various stressors thereby consequently increasing the chances of illness and mortality. Many changes occur as people enter old age and these changes decrease quality of life.

Malnutrition is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems. It may involve calories, protein, carbohydrates, vitamins, or minerals. Malnutrition is often used specifically to refer to under nutrition where there is not enough calories, protein, or micronutrients. Poor nutritional status and malnutrition in the elderly population are important areas of concern.

Malnutrition and unintentional weight loss contribute to progressive decline in health, reduced physical and cognitive functional status, increased utilization of health care services, premature institutionalization, and increased mortality. Nonetheless, many health care practitioners inadequately address the multi factorial issues that contribute to nutritional risk and to malnutrition. A common assumption is that nutritional deficiencies are an inevitable consequence of aging and disease and that intervention for these deficiencies are only minimally effective [2]. Hence, despite the high prevalence of malnutrition among elderly, nutritional problems were not yet acknowledged by health professionals. The need for nutritional assessments and interventions are particularly crucial in this age group.

To determine the nutritional status, an earlier community survey was conducted at the Urban field practice area of PSG Institute of Medical Sciences and Research, Coimbatore on 154 households and 190 elders aged 60 years and above were interviewed. Malnutrition was assessed using mini nutritional assessment test (MNA) in which 37 were found to be malnourished, 47 were found to be at risk of malnutrition and 106 were found to be normal [1]. The predictive validity of mini nutritional assessment test has been validated in several studies by demonstrating its association with adverse health outcomes, social functioning, mortality, and higher rates of visit to general practitioner. Besides, this test has the advantage that without any laboratory test, nutritional status of elderly can be determined with questions and anthropometric measurements [1].

There were very few studies in which malnutrition is correlated to functional capacity in the elderly. Oliveira, et al. studied nutritional status and functional capacity in hospitalized elderly [3]. Li-Chin, et al. were able to show that MNA assessment could predict activity of daily living (ADL) and instrumental activity of daily living (IADL) status in community-dwelling elderly in Taiwanese population [4]. However, they did not do a comprehensive assessment of other parameters of functional capacity and nutrition. In order to suggest more appropriate measure to improve the health of the elders, further geriatric comprehensive assessment tests are needed to assess other geriatric syndromes. The present study was undertaken to compare the prevalence of other geriatric syndromes among malnourished and normal elders living in a community.

METHODS

Study design

This was a cross sectional study conducted to do an in depth comprehensive assessment among a sample of malnourished and normal elders.

Ethics

We have obtained the institutional ethical committee clearance prior to the study.

Sample size

We have used the sample size calculation for two sample means. With an expected standard deviation of Barthel index in the normal group as 4 and expecting 3 units decrease in the malnourished group, with α=0.05 and β=0.20, the sample size required for this study was 30 in each group.

Inclusion and exclusion criteria

The present study was conducted during June-August 2016 at the urban field practice area of PSG Institute of Medical sciences and Research, Coimbatore. India. The urban health centre of PSG Institute of Medical Sciences and Research has six areas on which three areas were randomly selected. An earlier community survey was conducted in these areas to estimate the prevalence of malnutrition [1]. The selected areas were HUDCO colony, AD colony, and Pattalmman Kovil street. The total number of households in these areas were 762. In 565 houses, there were no elderly people and non-response was obtained in 43 houses. Hence, we surveyed 154 households and 190 elders were examined in which 37 were found to be malnourished, 47 were found to be at risk of malnutrition and 106 were found to be normal [1]. From this study population, 30 malnourished and 30 normal adults were randomly selected.

Methodology

We have conducted a detailed comprehensive geriatric assessment after obtaining informed consent. Dementia was assessed using ‘mini-cog test” which include word recall score with a range of 0 to 3 and clock drawing score with range of 0 to 2. A total score of 0 to 2 indicates positive screen for dementia and 3 to 5 indicates negative screen for dementia [5]. Depression was assessed using validated “Geriatric depression scale” [6,7]. Barthel index test was done to measure the activity of daily living (ADL) [8]. This include a pre fixed score for feeding, bathing, grooming,

dressing, bowels, bladder, toilet use, bed to chair and back transfers and mobility on level surfaces and on stairs. In addition, we have conducted get up and go test (GUGT) [9]. Other established geriatric syndrome studied were visual disturbance, hearing loss, urinary incontinence, insomnia, dizziness, hearing loss and fall.

Statistics

The mean and Standard deviation (SD) of, ADL and GUGT were calculated and compared between malnourished and normal using independent t-test. Similarly, the prevalence of geriatric syndrome between normal and malnourished were compared using Chi square test. The data were analyzed using SPSS. $P<0.05$ was considered as statistically significant.

RESULTS

The mean (SD) of age in this subsample population for malnourished people was 71.33 (7.41) years and normal was 68.67 (5.91) years. The mean (SD) of MNA score for malnourished was 15.38 (1.23) and normal was 24.9 (2.48) (Table 1).

Table 1 Characteristics of the sample population by nutritional status

Variables		Normal (Mean (SD))	Malnourished (Mean (SD))	P value
Age		68.67 (5.91)	71.33 (7.41)	0.129
MNA		24.9 (2.48)	15.38 (1.23)	P<0.001
Sex (%)	Men	7 (23.3%)	12 (40.0%)	0.165
	Women	23 (76.7%)	18 (60%)	-

The presence of various geriatric syndromes was significantly higher in malnourished elderly compared to normal. We observed that the prevalence of visual disturbances (86.71% vs. 53.3% $x^2=7.937$, $P<0.01$), dizziness, (60.0% vs. 16.7% $x^2=7.937$, $P<0.01$), hearing loss (40.0% vs. 10.0% $x^2=7.200$, $P<0.01$), dementia, (30.01% vs.3.3% $x^2=7.680$, $P<0.01$) and depression (60.0% vs. 13.8% $x^2=13.464$, $P<0.01$) were significantly higher in malnourished compared to normal elderly. The functional dependence mean + standard deviation (for GUGT (2.16+0.83 vs. 1.36+0.49 t=4.530 $P<0.001$ and Barthel index (83.50+12.18 vs. 90.66+6.91 t=2.801 $P<0.01$) were also significantly different between malnourished and normal elderly (Table 2).

Table 2 Association of geriatric syndromes with malnutrition

Geriatric syndromes	Normal (N=30)	Malnourished (N=30)	P value
Visual disturbance	16 (53.3%)	26 (86.71%)	P<0.01
Urinary incontinence	1 (3.3%)	2 (6.7%)	0.554
Insomnia	11 (36.7%)	16 (53.3%)	0.194
Dizziness	5 (16.7%)	18 (60.0%)	P<0.01
Deafness	3 (10.0%)	12 (40.0%)	P<0.01
Fall	9 (30.01%)	11 (36.7%)	0.584
Dementia	1 (3.3%)	9 (30.01%)	P<0.01
Depression	4 (13.8%)	18 (60.0%)	P<0.001
Get Up and Go Test (GUGT Score) (Mean + SD)	1.36+0.49	2.16+0.83	P<0.001
Barthel index score (Mean + SD)	90.66+6.91	83.50+12.18	P<0.001

DISCUSSION

The world health organization has stated that aging population will present new challenges for health care [10]. The health of the elderly will be an important issue defining the health status of the population [11]. The mini nutritional assessment scale (MNA) is a widely used international questionnaire to evaluate the nutritional state of elders with high sensitivity (98.9%), specificity (94.3), and diagnostic accuracy (97.2%) [1]. However in India, only very few community studies were conducted to estimate malnutrition among elderly [1]. Both its reliability and validity were assessed by Mathew, et al. and found reliable and valid in Indian context [11,12].

The elderly is the fastest growing segment of the population including in India. Malnutrition has emerged as an important problem among elderly. In our earlier study, we have reported an estimated prevalence of 19.47% in the general population. There are different mechanisms involved in the development of malnutrition in elderly include gastrointestinal and endocrine system disorders, loss of taste and smell, decreased appetite and inadequate dietary

intake that is related to both disease state and psychosocial factors [12]. Many studies reported sarcopenia, immobility, social isolation, and dementia were also associated with decreased oral food intake [13]. The term 'geriatric syndrome' is used to cover functional impairment, cognitive impairment, malnutrition, incontinence, falls, depression, psychosis, insomnia, vertigo, and other related disorders [13].

In our study, nutritional status of malnourished patients was found correlated with the number of established geriatric syndromes. Dementia was one among them which had significantly higher proportion in malnourished group compared to normal group. Many studies reported that cognitive deterioration in the elderly affects daily functional status and instrumental activities which result with disability, dependence and decreased oral intake [14]. Many studies found greater impairment in both simple and instrumental daily living activities and a more severe ideomotor praxis deficit in patients at risk of malnutrition [15]. Activity of daily living measured through GUGT test and Barthel index test was associated with nutritional status in this study. We have also observed a significant association between visual disturbance and malnutrition. Visual activities can lead to fall which can affect the activity of daily living [3]. In an earlier study, it was observed that ADL was shown a relation between dietary quality and geriatric outpatients. Lower self-efficacy, a lower score of attitudes toward health and difficulty with meal preparation were found to be the common problems in many reported studies [2].

Depression has been proven to be a very common cause of weight loss in the older patients [16]. It was observed in some studies that weight loss in depression occurs in 90% in older patients, compared with only 60% in the youngsters [17]. It was also observed that causes of malnutrition in depressed patients mainly involve lack of appetite, loss of interest in self-care, apathy, and physical weakness [17]. In general, inadequate nutritional intake is associated with various conditions of older people, in particular, with subjective conditions such as mood and functional status and with objective situation such as living alone, income and education [18].

However, causal relationships between the factors and the nutritional status were unclear. Another limitation of the study is the collection of data from a small sample population. Large scale studies are needed for confirmation of findings. Another limitation of the study is dementia was assessed using mini cog test which was not followed up by confirmatory MMSE [18] as it is difficult to use in rural illiterate population. Despite these limitations, our study has several strengths. We have used validated tests to assess the geriatric syndrome. Many of these earlier studies were hospital based and not much studies were done at community. In addition, cases and controls were selected through a well-defined sampling procedure.

CONCLUSION

The presence of various geriatric syndromes was significantly higher in malnourished elderly compared to normal. This association between malnutrition and the presence of geriatric syndromes needs further study as either could be causative or a sequel of each other. An understanding of these causes is essential to formulate appropriate treatment strategies. Although an adequate nutrition supply is the key to the treatment of malnutrition, it alone may not necessarily be successful. Other causative factors must also be addressed and treated. In conclusion, the interventional programs for malnutrition among elderly should also identify and address their geriatric syndromes.

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