Screening for Malnutrition among the Elderly with MNA Scale: A Clinic based Study in a Rural Area of West Bengal

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ABSTRACT

Introduction: Aging is an inevitable phenomenon and increase in life expectancy over the year has led to rapid increase elderly population both in developed and developing countries. Among different elderly health issues like chronic non communicable disease, mental health, disability, ocular morbidity, malnutrition also quite prevalent and its usually coexists with other morbidities. The magnitude of malnutrition among the elderly in India is underreported. The present study was carried out to assess the nutritional status of the elderly aged 60 years and above by using MNA-SF (Mini Nutritional Assessment questionnaire- Short Form) tool and the various factors influencing their nutritional status in rural area of West Bengal

Material and methods: An Institution based cross-sectional study was conducted in Diara and Nanda Sub-centers, under Rural Health Unit and Training Centre (RHUandTC), Singur, from July to August 2016 and 144 elderly were interviewed at Outpatient department during data collection period. Nutritional status was assessed with the help of the MNA SF questionnaire. Calculated Cronbach's alpha of this 6 items MNA-SF scale (in Bengali language) was 0.87 indicating internal consistency was maintained between the items.

Results: Mean (standard deviation) age of the study population (n = 144) was 70.82 (6.9) years and 52.1% were male. In this population, 27 (31.2%) was malnourished and 72 (50%) were at risk for malnutrition. Multivariable logistic regression analysis showed that after adjustment female gender AOR(CI) 4.1(1.2-14.8), poor economic condition AOR (CI) 3.6 (1-12.9) and also chronic comorbidities AOR(CI) 3.8(1.0-14.6) were significantly associated with elderly malnutrition.

Conclusion: The proportion of malnutrition observed in the aged people of rural area is undoubtedly high. The findings of the present study indicate that malnutrition is multifactorial and thus it should be managed through multidisciplinary health education approach with special emphasis on correct diet both in quantity and quality.

Keywords: Elderly, Malnutrition, Mini Nutritional Assessment

INTRODUCTION

Ageing is a natural and unavoidable process in human life. With the advancement of medical science, health care delivery system and various other factors - life expectancy of the people is increasing gradually. According to United Nations estimates, the world population of the elderly 60 years and above will achieve 1.2 billion by 2050, increasing from 901 million in 2015.[1] The number of elderly is on the increase, both in developed and developing countries.[2] In India, geriatric age group (aged 60 years and above) constitute 8.6% of the total population as per 2011 census.[3] This rapid rise in elderly population will definitely give rise to several challenges for health care system.

The health of the elderly is an important issue defining the health status of a population.[4] Among different health issues like chronic non communicable disease, mental health, disability, ocular morbidity, malnutrition also quite prevalent and it always exists along with different other problem. The magnitude of malnutrition among the elderly in India is underreported. Studies have shown that more than 50% of the older population is underweight.[5]

Most nutritional intervention programs are directed toward infants, young children, adolescents, and pregnant and lactating mothers. In India, the nutrition and health of the elderly is often neglected more so in rural India. Elderly malnutrition is an ice berg phenomenon and mostly underdiagnosed. The health of the elderly is compounded by poor nutrition together with different comorbidities which create a vicious cycle which causes unnecessary increased financial burden on their family and health sector.

Malnutrition is mostly modifiable and therefore it is important to develop and implement adequate interventions strategies for it's prevented and control. Early identification of malnutrition should be the first step, but the problem is that there is no specific tool for assessment of elderly malnutrition. Certain elderly conditions like postural changes, vertebral compression, edema or ascites, inability to stand and many others may lead to inaccurate BMI and inaccurate assessment of nutritional status.

The Mini nutritional assessment (MNA) tool is an internationally well accepted, validated tool for assessing malnutrition in the elderly and it fulfills many criteria for both screening and diagnostic measures. With this background the present study was carried out to assess the nutritional status of the elderly by using MNA-SF (Mini Nutritional Assessment questionnaire- Short Form) tool[6] and the various factors influencing their nutritional status in rural are of West Bengal. This will initiate further studies in this concerned

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1978

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issue and it may also help to bring this important health issue of elderly under consideration of health policy.

MATERIAL AND METHODS

This is an Institution based cross-sectional study conducted in Diara and Nanda Sub-centers, under Rural Health Unit and Training Centre, Singur, which is the rural field practice area of All India Institute of Hygiene and Public Health, Kolkata.

Elderly people aged 60 years and above who visited OPD during data collection period were included in the study. Those who were too sick were excluded from this study. Approval for the study was obtained from the Institutional Ethics Committee. Informed consent was obtained from each patient included in the study. To cover a patient for interview, measurement and reviewing medical records, it took 15 to 20 minutes. During OPD hours it was possible to interview only 8-10 patients. The researcher attended the OPD for 2 days a week for a period of 2 months (July –August 2016). Thus the data was collected from 144 elderly patients

Study tool

A pre-tested structured interview schedule containing both open and close ended questions was prepared and face validity and content validity of the schedule was checked by experts of AIIH and PH, Kolkata. This tool was translated into local language (Bengali), semantic equivalence was maintained and pretested in 20 households and was finalized after due modification.

The schedule included 2 parts

1. Questions regarding socio-demographic profile and questions to ascertain the comorbidity (history of chronic medical illness), physical activity, history of regular medication

2. Mini Nutritional Assessment questionnaires- Short Form (MNA-SF)[6], a validated questionnaire for simple and rapid assessment of the nutritional status of elderly people. Mini Nutritional Assessment questionnaire- Short Form is a widely used international questionnaire to evaluate the elderly nutritional state with high sensitivity (98.9%) and specificity (94.3%), with an accuracy of 98% when it was compared with a comprehensive nutritional assessment, including biochemical tests, anthropometric measurements and dietary assessment.[7] The tool comprises of 6 questions clustered in sections: Anthropometric assessment (BMI or calf circumference); general assessment (like –food intake, any weight loss, mobility, any acute disease, and dementia as neuropsychological problem). Estimated Cronbach's alpha of this 6 items MNA-SF scale =0.87(in Bengali language) indicates that good internal consistency was maintained between the items.

Operational definition

The age determination used to define 'elderly' varies among researchers. However, present study used '60 years and over' as the age cut-off to refer to the elderly people.

Dependent variable

The nutritional status of elderly people was the Outcome/ dependent variable of this study measured by MNA-SF, a validated questionnaire

Normal nutritional status=12-14 points;

At risk of malnutrition=8-11points;

Malnourished =0-7 points

In order to find out the association of important variables with nutritional status, by the group of MNA scoring those who fell into the categories of normal nutritional status and those who fell into the "At risk" category were clubbed as not-malnourished and others were categorized as malnourished.

Independent variables

- Socio demographic and socio economic variables (age, sex, marital status, educational status, occupation, Family income, Economic dependency of the study subject.
- Comorbidity was assessed by the number of underlying chronic diseases of elderly people. The following chronic diseases were considered: Hypertension, diabetes, and cardiovascular disease, muscular skeletal, digestive problem and chronic obstructive lung disease (COPD).
- Physical exercise or brisk walking around 30 min /day with minimum 5 days per week –considered as adequate.
- History of regular medication

STATISTICAL ANALYSIS

Data were entered and analyzed in Statistical Package for the Social Sciences (SPSS) version 16. Descriptive statistics along with bivariate and multivariable analysis was performed to assess the independent association of the covariates with the presence of malnutrition with a confidence interval of 95%. Hosmer and Lemeshow test was performed to test the goodness of fit of the model. In addition, Nagelkerke R2 and Cox and Snell R2 as well as classification table of the models were also computed to analyse the variances of the predictors of malnutrition of the elderly.

RESULTS

Mean (SD) age of the study subject (n = 144) was 70.82 (6.9) years and among them 52.1% was male population. Most of them were Hindus (58.3%) and the rest were Muslims. Out of total population 65.3% belonged to SC, ST and OBC category. All participants in this study were living with their families. Among males mostly were farmers by occupation and most of the women were homemakers (87.8%).95.1% of family belonged to socio –economic class-3 and 4 (according to modified BG Prasad scale 2016). Most of malnourished participants (62.1%) were illiterate and financially dependent on family members (86.7%).

In this population, 27 (31.2%) were malnourished (MNA <7.0) and 72 (50%) were at risk for malnutrition (MNA 8-11) [Table- 1].

Hypertension and diabetes were found as most prevalent morbidities in this study setting. All participants were able to manage their basic daily activity (like feeding, bathing, dressing, toileting) independently. [Table 2] Around 73% of elderly person had inadequate dietary habit. The common

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1979

Responses	Number	%
1. Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?		
a) Severe decrease in food intake=0	25	17.3
b) Moderate decrease in food intake=1	51	35.4
c) No decrease in food intake=2	68	47.2
2. Have you lost any weight without trying over the last 3 months?		
a) Weight loss greater than 3kg (6.6lbs)=0	0	0
b) Does not know=1	60	41.6
c) Weight loss between 1 and 3kg (2.2 and 6.6 lbs.)=2	38	26.3
d) No weight loss=3	46	31.9
3. How would you describe your current mobility?		
a) Bed or chair bound=0;	0	0
b) Able to get out of bed / chair but does not go out=1	14	9.7
c) Goes out=2	130	90.3
4. Has suffered psychological stress or acute disease in the past 3 months?		
a) yes=0	36	25
b) no=2	108	75
5. Neuropsychological problems		
a) Severe dementia or depression=0	24	16.6
b) Mild dementia=1	84	58.3
c) No psychological problems=2	36	25
6. Body Mass Index (BMI) = weight in kg / (height in m)2		
a) BMI less than 19=0	25	17.4
b) BMI 19 to less than 21=1	38	26.4
c) BMI 21 to less than 23=2	40	27.8
d) BMI 23 or greater=3	41	28.5
Nutritional Status(As per MNA-SF scale)		
Normal	27	18.8
At risk	72	50.0
Malnourished	45	31.3

Table-1: Response of study subjects to the different items of MNA-SF and nutritional status of study subjects according to MNA-SF (n=144)

Morbidities	Number	%
Hypertension	75	52.1
Diabetes	60	41.6
Cardio vascular diseases	6	4.16
Chronic obstructive pulmonary disease	16	11.1
Acid peptic disorder	36	25
Musculo skeletal problem	46	31.9
No morbidity	42	29.1
# [Multiple responses]		

Table-2: Distribution of Study Subjects According To Different Morbidities [n-144] #

reasons cited for inadequate dietary habit were difficulty in chewing and swallowing (25.18%), loss of appetite (16.42%), and indigestion (15.9%). Two other mentioned important reasons were poor affordability and not satisfied with provided food.

In the multivariable analysis after adjustment, significant independent association was found between malnutrition and female gender, poor economic condition and associated chronic comorbidities. Our final model was found fit well by Hosmer–Lemeshow statistic (P = 0.683). All the independent variables explained between 29.1% (Cox and Snell R2) to 40.8% (Nagelkerke R2) variation of nutritional status

[Table 3].

DISCUSSION

The present study among 144 geriatric people shows a high proportion of malnutrition (30%). Female gender, poor socioeconomic status, and living with comorbidities were independently associated with malnutrition.

As per MNA-SF[6] scoring system present study revealed that 31.3% of the elderly were malnourished and 50% were at risk which was consistent with result of other studies done in West Bengal[10] and Bangladesh, where MNA was used.[8,9] However different Studies conducted in different part of India found that malnourished elderly were 14 to 20% of examined elderly which was far less than present study but the proportion of ' at risk' elderly was quite similar (43 -51%) to present study.[2,7,10,11] In Coimbatore malnourished elderly (8%) and at risk (24%) both were less as compared to this study.[12] In Lebanon malnourished elderly and at risk both were less (8%, 29%respectively) as compared to this study.[13] In this study the association between poor MNA status and female gender was found to be statistically significant independently. Previous studies had also reported similar finding.[2,7,8,10,13]

Poor socioeconomic status or less family income was found

Variable		Elderly	Malnourished Subject No (%)	Sig. (P value)	eAOR (95% C.I.)
Age	Up to 70	75	12(16)		1
	More than 70	69	33(47.8)	0.08	2.5(0.8-7.6)
Sex	Male	75	12(16)		1
	Female	69	33(47.8)	0.03	*4.1(1.2-14.8)
Marital status	Currently married	106	24(22.6)		1
	Widow	38	21(55.3)	0.65	1.2(0.4-3.9)
Education	Primary and above	79	15(19)		1
	Less than primary	65	30(46.2)	0.79	1.2(.39-3.5)
Family income	More than 1887	73	13(17.8)		1
	1887 or less	71	32(45.1)	0.04	*3.6(1-12.9)
Economic dependency	Self- dependent	39	6(15.4)		1
	Dependent on others	105	39(37.1)	0.31	0.4(.12-2)
Physical exercise	Adequate	35	6(17.1)		1
	Inadequate/ not practiced	109	39(35.8)	0.69	1.3(0.3-5.1)
Morbidity	Any one	42	5(11.9)		1
	2 or more	102	40(39.2)	0.04	*3.8(1.0-14.6)
Regular medicine	Less than 3	45	21(24.7)		1
	3 or more	97	24(46.7)	0.08	2.7(0.8-3.8)
CI - Confidence Interval; e AOR-Adjusted odds ratio; *- Statistically significant (P<0.05).					
Table-3: Univariate and Multivariable Logistic Regression for Predictors of malnutrition [n=144]					

to independently associated with malnutrition. This was also found in other previous studies[8,12] and this could be attributed to the fact that poor economic conditions influence dietary choices and eating patterns which ultimately affect the nutritional status of the elderly.

The most common reasons cited for poor dietary habit were poor affordability (42%), difficulty in chewing and swallowing (35.75%), and loss of appetite (23.3%).This result was in agreement with the result of other studies where inadequate calorie intake[4,7] and decreased food intake, and fewer consumption of meals were significantly associated with lower MNA scores[8,11]

In present study comorbidities found to be significant after adjustment. Similarly association between health problem and nutritional status was found in Bangladesh.[9]

Many studies reported a strong association between age[7,10], educational level[9] with malnutrition. However, this study, could not observe any such significant association.

The study, could not observe any significant association between lifestyle factors (particularly smoking and alcoholism) and malnutrition and this finding also true in another study.[14]

The study could not revealed a significant independent association between financial dependency with nutritional status but some studies found that not having an income and not receiving regular financial support were associated with poor nutritional status.[4,7,9,12]

Studies showed single /widowed/divorced compared to married[12] and elderly who lived alone[7] were significantly more vulnerable to malnutrition. However none of the elderly in the present study lived alone and current marital status did not show any significant association with malnutrition.s

The strength of the study lies in the fact that the researchers had used a validated questionnaire to elicit the prevalence of malnutrition as well as explain the somatic(chronic morbidity,

regular medication), lifestyle characteristics like physical activity of study participants along with socio demographic factors in its conceptual framework. However, our study had some limitations. This is a cross-sectional study and hence could not establish cause–effect pathway. Secondly, data was collected based on the individual response or sometimes previous medical reports. This could have led to both over and under reporting of comorbidity. No assessment of biochemical parameters of nutritional status and hemoglobin were done because of constraints of resources.

CONCLUSION

The proportion of malnutrition observed in the aged people of rural area is undoubtedly high. The findings of the present study indicate that malnutrition is a multifactorial condition. Hence, this study suggests that malnutrition should be addressed through multidisciplinary approach with emphasis on correct, feasible and quality nutritional advice. Further research is needed to develop appropriate interventional programs and guidelines for control and prevention of malnutrition among the elderly.

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