Nutritional Status according to Mini Nutritional Assessment (MNA) in an Elderly Population in the Northwest Rajasthan

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ABSTRACT

Introduction: *The early detection of malnutrition and the risk of malnutrition is an important challenge for improving the care of elderly people. There is definite evidence that malnutrition is more common in geriatric population but it is underestimated in diagnostic and therapeutic procedures. MNA is a tool to identify those at risk of malnutrition who can benefit from early intervention.*

Objective: *The present study was carried out to assess Nutritional Status According to Mini Nutritional Assessment in ≥ 65 years. The study the impact of socioeconomic status, living arrangement, smoking and alcohol on nutritional status.*

Material and Methods: *It was a cross sectional study of 500 elderly subjects of age≥ 65 years (63% subjects from urban area and 37% subjects from rural area). Nutritional status assessment was done by using 18 items (30 points) Mini nutritional assessment (MNA) scale.*

Results: *Present study showed that 11.6% elderly were malnourished while 46% were at risk of malnutrition*

and only 42.4% were well nourished. Malnutrition and risk of malnutrition was more common in rural 104 (52.21%), 47 (25.41%) than urban 126 (40%), 11 (3.49%) respectively. Prevalence of malnutrition was more in lower class (BPL) 28 (36.84%) than upper class (lower middle) 5 (10.20%). Prevalence of malnutrition in smokers, ex-smokers, tobacco-chewers and non-addicts was 20.25%, 13.38%, 0% and 8.30% respectively. Prevalence of malnutrition in alcoholic consuming, occasional and not consuming was 15.90%, 12.50% and 11.13% respectively. Prevalence of malnutrition in With spouse & Children, with children, with souse and alone was 11.68%, 13.63%, 10.20%, and 0% respectively.

Conclusion: *Nutritional status declines further as the age advances. Nutritional status of our urban elderly was better than nutritional status of rural elderly. Mini Nutritional Assessment (MNA) is one of the very good nutrition screening/assessment tools. We can identify risk of malnutrition in early stage and do intervention on timely. Nutritional evaluation should be a part of clinical assessment of elderly.*

Key words: *malnutrition, elderly, Mini nutritional assessment, MNA.*

INTRODUCTION

"The ageing process is of course a biological reality which has its own dynamic, largely beyond human control"[1]. According to the World Health Organization (WHO) report, the population of elderly people have showed a fast grow in the world. Therefore, the health and fitness of this group will be one of the important issues in health care systems[2].

The early detection of malnutrition and the risk of under nutrition [3] is an important challenge for improving the care of elderly people. The development of malnutrition is a continuum, starting with inadequate food intakes followed by signs of changes in biochemical indices and body composition[4]. Malnutrition in elderly people is associated with impaired general physical condition and activity[5] and increased mortality rate[6].

There are an estimated 605 million older persons, i.e. age 60 and over, in the world today, nearly 400 million of whom live in low-income countries. Greece and Italy have the highest proportion of older persons (both 24% in 2000). By 2025, the number of older persons worldwide is expected to reach more than 1.2 billion, with about 840 million of these in low-income countries. Within the next 25 years, Europe is projected to retain its title as the world's oldest region. Older persons currently represent around 20% of the total population and the proportion is expected to increase to 29% by 2025.By 2025 Japan and Switzerland will have the highest proportion of older persons (35%), followed (in decreasing order) by Italy, Germany, Greece and Spain (all > 30%). By 2025, the proportion of the population aged 60 and over is expected to reach 25% in North America, 21% in eastern Asia, 14% in Latin America and the Caribbean, and 11% in south and central Asia. During the next 25 years, many low-income countries will displace high-income countries in terms of the number of people

aged 60 and over. By 2025, five low-income countries will be among the ten countries with the largest population of older persons in the world: China (287 million), India (168 million), Indonesia (35 million), Brazil (33 million), and Pakistan (18 million).[14]

India has nearly seven percent of its total population shuffling across the line that defines the elderly with seventy six million aged above sixty (Census Report, 2001)[7]. By 2016, it is expected to rise to 114 million constituting 8 to 9 percent of the total population. The Indian aged population is currently the second largest in the world to that of China leading with 100 million elderly. The life expectancy at birth which was 70 years in 1990 is projected to reach 82 years by 2020 (IIPS, 2009)[8].

The Mini Nutritional Assessment (MNA) is one of the most widely used and studied nutrition screening/assessment tools. It was developed and validated with clinical data of patients in Europe and USA in the 1990s for grading the nutritional risk of older adults in Western countries [9-11]. It has sensitivity of 96% [12] and the specificity is of 98% and the prognostic value for malnutrition is of 97% [9] Thus, the MNA is considered a very useful instrument for assessing long-term nutritional risk but not as useful for short term prognosis[13] .The present study was carried out to assess nutritional status in elderly by Mini Nutritional Assessment and the impact of demographic, socio-economic, living arrangement, smoking and alcohol factor on nutrition.

MATERIAL AND METHODS

It was a cross sectional study of 500 elderly subjects of age ≥65 years (63% subjects from urban area and 37 % subjects from rural area). This study was conducted in the Geriatric clinics during January 2010 to January 2011. Most of the elderly persons visited the clinics. Individuals to be interviewed and sampled will be selected by systematic random sampling method. Consent from patients was also taken before filling Performa on consent form. For this study, permission also taken from medical ethics board of the medical college.

Nutritional status assessment[20] was done by using 18 items (30 points) Mini nutritional assessment (MNA) scale which included questions regarding appetite, Weight, mobility, acute and chronic illness, medication history, dietary history, anthropometric measurements (BMI, MAC, MCC) and self perception of nutritional status and health. Interpretation of scores was done as follows:

Score <17: Malnourished

Score 17-23.5: At risk of malnutrition

Score - 23-5: Well nourished.

All the subjects were interviewed for demographic profile, present, past, occupational, family, personal and social history, thorough clinical examination was performed. Anthropometric measurements like weight, height, mid arm circumference (MAC) and maximum calf circumference (MCC) were recorded and BMI was calculated.

Sample size- sample size calculation was done by calculator of open epi statical website.500 sample was taken in this study.

Statistical Analysis

Data was statistically analyzed using SPSS for windows version 10. Z-test was performed to evaluate normality of distribution. Chi-squared test or χ^2 test was used for comparing groups of data. A p value of <0.05 was taken to indicate statistical significance.

RESULT

The present study shows that 500 subjects in which 58 (11.6%) elderly were malnourished 230 (46%) were at risk of malnutrition and only 212 (42.4%) were well nourished and male were 315 and female were 183. Prevalence of malnutrition and risk of malnutrition was more common in female 90 (48.64%), 28 (15.13%) than male 140 (44.44%), 30 (9.52%) respectively. (Table No.1)

Urban and rural patients were 315 and 185 respectively. Malnutrition and risk of malnutrition was more common in rural 104 (52.21%), 47 (25.41%) than urban 126 (40%), 11 (3.49%) respectively. (Table No.2).Prevalence malnutrition was more in lower class (BPL) 28 (36.84%) than upper class (lower middle) 5 (10.20%). which is further supported by the statistical analysis data (χ^2= 10.87, p = 0.03). (Table no 3)

 Prevalence of malnutrition was increasing with decreasing S.C. classes but not much significantly which is further supported by the statistical analysis data (χ^2 =2.24 P = 0.54). But prevalence of at risk of malnutrition was increasing with

decreasing S.C. classes but much significantly which is further supported by the statistical analysis data (χ^2= 40.80 P = 0.001). (Table no.4)

Prevalence of malnutrition in smokers, ex-smokers, tobacco-chewers and non-addicts was 20.25%, 13.38%, 0% and 8.30% respectively. Prevalence of at risk malnutrition in smokers, ex-smokers, tobacco-chewers and non addicts was 48.10%, 47.88%, 50.0% and 44.40% respectively. More were at risk of malnutrition among smokers than others which is further supported by the statistical analysis data (χ^2= 9.11   P = 0.01). (Table no.5)

Prevalence of malnutrition in alcoholic consuming, occasional and not consuming was 15.90%, 12.50% and 11.13% respectively. Prevalence of at risk malnutrition in alcoholic consuming, occasional and not consuming was 45.45%, 50.0% and 45.90% respectively. More were at risk of malnutrition among alcoholics than others but not significantly which is further supported by the statistical analysis data (χ^2=0.901 P=0.63). (Table no.6)

prevalence of malnutrition according to living arrangement in With spouse & Children, With children, With souse and alone was 11.68%, 13.63%, 10.20%, and 0% respectively but not significant difference (χ^2= 0.366   P=0.83). prevalence of at risk of malnutrition according to living arrangement in With spouse & Children, With children, With souse and alone was 45.86%, 56.81%, 43.87% and 16.66% respectively but not significant difference (χ^2=4.32 P=0.22).(Table no.7)

Table 1: Prevalence of nutritional status male and female

	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Male (316)	146(46.34)	140(44.44)	30(9.52)
Female (184)	66(35.67)	90(48.64)	28(15.13)
Total (500)	212(42.40)	230(46.0)	58(11.6)

Table 2: Prevalence of nutritional status urban and rural…

	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Urban (315)	178(56.5)	126(40.0)	11(3.49)
Rural (185)	34(18.37)	104(56.21)	47(25.40)
Total (500)	212(42.40)	230(46.0)	58(11.6)

Table 3- Prevalence of nutritional status among socio-economic class (Rural)...

	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Upper high	0	0	0
high	0	0	0
Upper middle	7 (53.84)	6 (46.15)	0
Lower middle	15 (30.61)	29 (59.18)	5 (10.20)
Poor	6 (11.32)	33 (62.26)	14 (26.41)
Very poor / BPL	6 (7.87)	36 (47.36)	28 (36.84)

$\chi^2 = 10.87$ P= 0.03

Table 4- Prevalence of nutritional status among socio-economic class (urban)...

	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Upper	5 (100)	0	0
Upper middle	57 (83.82)	10 (14.70)	1 (1.47)
Middle lower middle	79 (60.76)	47 (36.15)	4 (3.07)
Lower upper lower	34 (34.34)	60 (60.60)	5 (5.05)
lower	3 (23.07)	9 (69.23)	1 (7.69)

χ^2= 40.80   P = 0.001 χ^2 =2.24   P = 0.54

Table 5- Prevalence of nutritional status in smokers and non smokers.

Smokers	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
No addict	131 (47.29)	123 (44.40)	23 (8.30)
Ex-smoker	55 (38.73)	68 (47.88)	19 (13.38)
Smoker	25 (31.64)	38 (48.10)	16 (20.25)
Tobacco Chewer	1 (50.0)	1 (50.0)	

χ^2= 10.87   P= 0.03

Table 6- Prevalence of nutritional status among alcoholics...

Alcoholic	No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Consuming	17 (38.63)	20 (45.45)	7 (15.90)
Occasional	6 (37.50)	8 (50.0)	2 (12.50)
Not consuming	189 (42.95)	202 (45.90)	49 (11.13)

χ^2 = 0.901   P=0.63

Table 7- Prevalence of nutritional status in relation to living arrangement..

		No malnutrition (%)	At risk of malnutrition (%)	Malnourished (%)
Rural	With spouse & Children	23 (16.54)	81 (58.24)	35(25.1)
	With children	3 (15.0)	12 (60.0)	5 (25.0)
	With souse	6 (27.27)	10 (45.45)	6 (27.27)
	Alone	2 (66.66)	1 (33.33)	
Urban	With spouse & Children	126 (5.43)	80(37.73)	6 (2.83)
	With children	10 (41.66)	13 (54.16)	1 (4.16)
	With spouse	3 (52.70)	33 (43.42)	4 (5.26)
	Alone	3 (100)		
Total	With spouse & Children	14 (42.45)	161 (45.86)	41 (11.68)
	With children	13 (29.54)	25 (56.81)	6 (13.63)
	With souse	45 (45.91)	43 (43.87)	10(10.20)
	Alone	5 (83.33)	1 (16.66)	

χ^2 =4.32 P=0.22 χ^2= 0.366 P=0.83

DISCUSSION

The present study analyzed the nutritional status of elderly people in the Indian population. The MNA score showed that approximately that 11.6% elderly were malnourished while 46% were at risk of malnutrition and only 42.4% were well nourished. The major reason for these findings may be attributed to the various causes of malnutrition in elderly patients which are also more prevalent in elderly and increases with age.

Another study carried out in Chinese Inpatients by H Soini1 et al [15], using the 18 items of the MNA scale, found that 3 % of the elderly were malnourished (vs. 11.6% in the present study), with 48% at risk of malnutrition (vs. 46 % in the present study), and 49 % with a good nutritional status (vs. 42.4 % in the present study). Possible reasons for the discrepancy are that the socioeconomic conditions are quite different. Similar trends of malnutrition were present in study by M Aliabadi et al[16].

Present study revealed that prevalence of malnutrition and at risk of malnutrition was more common in female than male (15.13% vis 9.52%) and (48.64% vis 44.44%) respectively. More females were found with malnutrition than males. We strongly feel that the higher prevalence of malnutrition in women in the present study could partly be a result of the effect of the traditional habits of eating. In many families, men usually eat before women. Women first serve the men. Women are the last people to eat, and share the remaining food. As their portions are smaller, this might result in poor nutrition. Similar trends of malnutrition were present in study by M Aliabadi et al[16], Rodriguez N et al[17].

Present study revealed that Rural elderly were more malnourished (25.4%) and at risk of malnutrition (56.21 %) than urban elderly (3.49% and 40.0% respectively). Similar trends of malnutrition were present in study by M Aliabadi et al[16].

The prevalence of malnutrition and risk of malnutrition more in lower socio economic class than upper class, more in smoker and alcoholic than in normal population. In our study prevalence of malnutrition according to living arrangement in With spouse & Children, With children, With souse and alone was 11.68%, 13.63%, 10.20%, and 0% respectively. Prevalence of at risk of malnutrition according to living arrangement in With spouse & Children, with children, with souse and alone was 45.86%, 56.81%, 43.87% and 16.66% respectively. More were risk of malnutrition with children than others. Above data showed malnutrition is more in peoples those living with children without spouse in this study because in our country parents are avoided by children in old age and they are frequently suffered with malnutrition or risk of nutrition.

Results from the present study also indicate that, among elderly persons, health problems rather than increment in chronological age has a greater negative impact on nutritional status. Malnutrition in low-income countries is intrinsically related to food insecurity, resulting in sections of the population with low food intake [18, 19]. It is plausible in the current context that the high level of malnutrition found among the elderly is a

cumulative effect of adverse economic factors occurring gradually through the life course and the presence of illness. Moreover, the simultaneous occurrence of abundant malnutrition and illness in the populations of low income countries imposes a dual burden on these societies, hampering their economic growth and development.

MNA is a tool to identify those at risk of malnutrition who can benefit from early intervention. Using MNA to describe nutritional status of the elderly in India, our data suggest that more than half of elderly individuals are malnutrition in our rural community, persons who can potentially benefit from interventions. It can contribute in reducing susceptibility to health problems such as infectious diseases associated with low-income countries, and consequently increasing opportunities for healthy ageing.

CONCLUSION

The overall prevalence of malnutrition and at risk of malnutrition in our study was 11.6% and 46% respectively. Prevalence of malnutrition was more in women and rural area than man and urban area. Prevalence of malnutrition was more in smoker, alcoholics, living with children without spouse and lower class socio economic status.

MASSEGE-

Mini Nutritional Assessment (MNA) is one of the most widely used and studied nutrition screening/assessment tools. We can identify risk of malnutrition in early stage and can do intervention on timely. Prevalence is very high in developing country like India so govt should taken serious commitment regarding to malnutrition.

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