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A Study to Assess Nutritional Status of Hospitalized Geriatric Age Group Patients of A Tertiary Care Hospital of Central India Using Mini Nutritional Assessment Score

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ABSTRACT

Introduction: Malnutrition in hospitalized patient in geriatric age group is a neglected problem in setting of India, with little attention towards nutritional assessment. Objective: The current study aims for nutritional assessment in geriatric population utilizing Mini Nutritional Assessment (MNA). Methodology: A cross sectional study in a tertiary care hospital of central India conducted on patients ≥ 60 years admitted during the period of Sep to Dec 2013 using MNA tool, excluding patients with severe disability and those in Intensive care unit (ICU). Result: A significant association was found between malnutrition & older age (P=0.0001), malnutrition & female gender (0.0096) and negative correlation between MNA score and age(r= -0.488, P=0.000), using chi square test & pearsons' correlation coefficient. Conclusion: This study is first of its kind in the setting of central India and lays a foundation of further research in context of geriatric age group in hospitalized.

KEYWORDS : Geriatric, Malnutrition, MNA, Hospitalized.

Introduction

Malnutrition for purpose of understanding conceptually is the nutritional imbalance resulting from over-nutrition, under-nutrition, reduced intake, increase need and reduced utilization due to physiological or pathological changes in the homeostatic milieu of human being.**(Dorland 2011, White et al 2012)** More objectively, for measuring it, various international organization have attempted to define it in specific context in which it is functional with valid and reliable comparisons **(WHO, 1999; Kelly, et al, 2013)**

Malnutrition as a Problem in Hospitalized Geriatric Patients

Malnutrition is a common but frequently ignored problem in hospitals evident from prevalence rate of disease-related malnutrition in hospital inpatients which varies from 25-40% (**Corish, Kennedy, 2000; Edington, et al, 2000**). Malnutrition is also a major geriatric problem associated with poor health status and high mortality, and the impact of a patient's nutritional condition on the clinical outcome has been widely recognized; malnutrition worsens the morbidity of disease and adds on to the risk of mortality as per many epidemiological and cross sectional hospital based studies conducted all over the world **(WHO, 2002; Salminen, et al, 2006; Phillips, et al, 2010).**

In terms of absolute number, most malnutrition among geriatric population exists in the community but the incidence is greater in hospital and nursing homes ranging 30-50% approximately. This may influence the prognosis associated with several pathological processes, loss of independence, decrease of quality of life, and increase of morbidity-mortality and hospital admissions (**Brown, 1991; Middleton, et al, 2001; Gout, et al, 2009**).

The problem of malnutrition is likely to be present and may be even worse in developing country like India compared to the developed country; as there is lack of major body of literature concerning the estimation of the magnitude of the malnutrition in terms of prevalence and incidence in the geriatric age group in particular in general hospital setting.

There are very few studies in India focusing the nutritional status of hospitalized geriatric patients and none for the nutritional risk assessment of geriatric patient admitted in hospital outside Intensive care unit (ICU) **(Chakravarty, et al, 2013).**

This study is unique in its approach addressing the estimation of nutritional risk and status assessment in geriatric age group patients outside Intensive care unit in the hospital.

Mini Nutritional Assessment Score: An Appropriate tool?

Malnutrition is an entity with multi-factorial causation and with multiple parameters on which it is assessed; age of the patient, gender, BMI, complication etc. are various factors on which it can be assessed. Furthermore, these multiple factors may work parallel or in unison towards the malnutrition status of the patient necessitating a tool to assess over all malnutrition on a single valid measure in form of score apart from the subjective clinical assessment.

Mini Nutritional Assessment Score is one such validated tool for the risk and status assessment approach in evaluating geriatric age group patients for malnutrition**(Kelly,et al 2013)**.It is used to identify patients who would normally be unrecognized and untreated resulting in reduced hospital stay and early measures for recovery process. Application of nutritional support based on nutritional assessment for risk and status may significantly reduce the incidence of complications and the length of hospital stay (**Chima, et al, 1997; Kelly,et al 2013**).

Aims & Objectives

This study was conducted with the primary objective assessing the nutritional status of hospitalized patients of a tertiary care hospital of central India, using MNA score, along with the demographic pattern associated with malnutrition in hospitalized patients. The Ultimate aim is to get insight into this less privileged issue of nutritional imbalance among the geriatric age group hospitalized patients and to lay foundation for further research and more attention towards the nutritional status of this specific group of population.

Methodology

The current study is a cross sectional hospital based study in a tertiary care hospital of central India conducted on all the adult patients above the age of 60 years admitted during the period of September 2013 to December 2013, taken from both medical and surgical wards. The patients who were having disability to the extent of not been able to be interviewed at the time of study and those who were in Intensive care unit (ICU) were excluded from the study.

Prior to the conduction of the interviews of the participant official permission from the concerned authority of the concerned department was obtained. Informed consent was obtained from each participant before interview. An overall 315 patients contacted for interview out if which 300 patients consented, with a response rate of 95.2%.

All consenting participants were assessed using the Mini Nutritional Assessment Form, and information was recorded in the proforma with items consisting of two basic section, First section consisting of data on hospital identification record including demographic data, presenting complaints, primary diagnosis, height, weight, dietary pattern, Food allergies, food preferences, physical activity level, personal habits, hydration status, specific nutritional deficiency and blood albumin level. The second section of proforma consisting of assessment by score composed of four types of assessments with maximum score of 30 points including:

1) Anthropometric assessment: BMI, mid arm circumference and weight lost during last three month.
2) Global evaluation questions on patient's independence, prescribed drugs consumption, psychological and physiological stress history, mobility and neuropsychological problems if any and presence of pressure sores or skin ulcers were ascertained.
3) Dietary assessment with detailed questions on frequency, source and type of meal consumption , appetite loss, digestive, chewing and swallowing difficulties, frequency of fruit and vegetable consumption and mode of feeding.
4) Subjective assessment with questions on nutritional problems, general health status in comparison with peers.

The following grading system is used after calculating the total score on MNA score:-

1. Well Nourished- A score of 24 or above
2. At risk of malnutrition- 17-23.5
3. Undernourished-17 or below

Result

In the present study, a total of 300 participants (age, 71.41 ± 2 x 0.44 years) were interviewed and assessed for nutritional status and risk using MNA score. Out of which, there were 190 male (age, 69.73 ± 2x0.49 years) and 110 were female (age, 71.6 ±2x0.81years). The Participants were classified and described by age class, gender and their nutritional status.

Out of the total 300 participants, 108(36%) patients were found to be malnourished as per MNA score. While 116(38.6%) patients found to be at risk of malnourished and only 76 (25.4%) were had a well nourished status. Malnourished status was found more common in female with 53 (48.2%) patient as compare to male with (29.3%) patients.

Table-1 **displays the distribution of the study population by their nutritional status by MNA score and demographic characteristic.**

Table- 1 Nutritional Status by MNA score and Demographic characteristics of Study Population

Study Population Characteristics		MNA Score			
	Malnourished	At risk	Well nourished	Total	
Sex	Age Groups	Mean	SE*	Mean	SE	Mean	SE	Mean	SE
Male	60-69	15.09	0.211	19.48	0.186	25.57	0.123	21.46	0.34
	70-79	14.84	0.147	19.5	0.342	25.7	0.196	17.73	0.5
	≥80	15.11	0.200	18	0.25	0#	0#	15.63	0.28
Total		14.98	0.102	19.41	0.160	25.58	0.13	19.78	0.3
Female	60-69	15.13	0.279	19.33	0.302	25.7	0.187	20.89	0.5
	70-79	14.86	0.189	18.9	0.404	24.75	0.475	18.06	0.74
	≥80	14.53	0.281	18.8	0.455	25	0#	16.86	0.6
Total		14.79	0.120	19.1	0.259	25.52	0.18	19.3	0.41
Grand Total		14.91	0.085	19.31	0.129	25.57	0.096	19.62	0.24

***-SE- Standard Error of Mean , #- only 0 or 1 participant**

Table-2: Association of Gender & Age group with Category of Nutritional Status

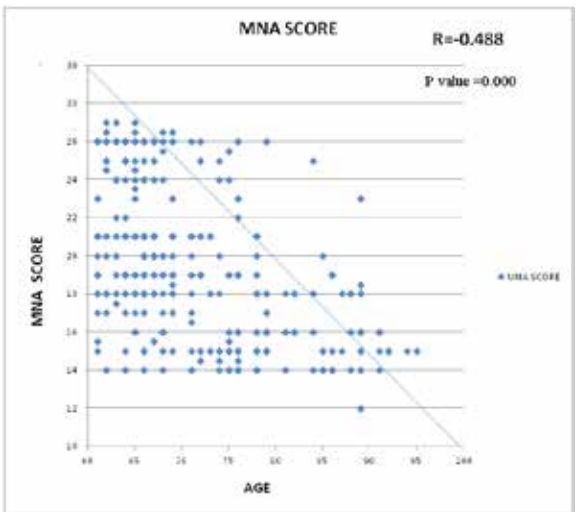
Demographic Variables		Category of Nutritional Status							
	Malnutrition		At Risk		Well Nourished		Grand Total		
	Freq	%	Freq	%	Freq	%	Freq	%	
Gender	Male	55	28.9	84	54.2	51	26.8	190	100
	Female	53	48.2	32	29.1	25	22.7	110	100
	Total	108	36	116	38.6	76	25.4	300	100
	P value	0.0096		0.0345		0.4756			
Age Groups	60-69 years	40	22.5	71	40.1	66	37.4	177	100
	70-79 years	37	48.7	30	39.5	9	11.8	76	100
	80 and above	31	66	15	31.9	1	2.1	47	100
	Total	108	36	116	38.6	76	25.4	300	100
	P value	0.0001		0.7436		0.0001			

Statistical Analysis revealed statistically significant association between female gender and malnutrition (P =0.0096). The age group of 80 years and above was also found to have a statistically significant association with malnutrition (P=0.0001).

Table-2 shows the above mentioned statistical association and distribution of participants by gender and age with nutritional status.

There was a negative co-relation between age and MNA score as shown by pearsons' correlation coefficient value (R) which is equal to -0.488 as shown in the Figure-1.

Figure-1: Correlation between MNA Score and age: Negative Co-relation coefficient (R= -0.488, P=0.000) signifying a lower MNA scores with increased age of the participant



Discussion

This study further strengthens the existing body of knowledge about the problems of malnutrition in hospitalized patients particularly in geriatric age group **(Waitzberga & Isabel, 2003)**. Malnutrition has been shown to cause impairment at cellular, physiological, physical and psychosocial level of the hospitalized patients (**Allison, 2000; Kubrack & Jennsen, 2007).**

The key findings of this study revealed age ≥80 years and Female gender to be the major victims of the malnutrition in hospitalized patients. 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. An overall reduction in appetite, alteration in taste, smell and subsequent decrease in the intake of nutrients are parts of aging, In addition to its other factors malnutrition include oral health, physical impairments, early satiety, and chronic diseases; poor dentition and physical immobility can cause difficulty with food acquisition chewing food and swallowing, leading to a decrease in nutrient intake, early satiety and physiological appetite loss (**Hall & Brown, 2005; Visvanathan & Chapman, 2009).**

The possible reasons for finding statistically significant association of Female gender and Malnutrition (P=0.0096) as per MNA score may be attributed to various social, economic, cultural and literacy related factors. In a study of Elderly Diabetic Patients in Libiya using MNA score for screening the nutritional risk, Malnutrition rates was more in female elderly patients compare to male patients.(**Badr, Elmabsout & Denna, 2014)** In another study, on 81 elderly persons to measure risk of malnutrition by the mini-nutritional assessment score, it was found that women had statistically significantly lower MNA scores than men (**Griep, Collys, et al, 2000).**

The significant negative correlation (R= -0.488, P=0.000) between the MNA score and age found in this study may be attributed to the components of composite MNA score which served as surrogate of nutrition status in its various dimensions of measurements. In a cross-sectional study to evaluate the nutritional status of elderly institutionalized patients, of nursing home Brazilian city of Uberlândia, using Mini-Nutritional Assessment scores found a negative correlation with age which they attributed to a worsening of the nutritional state with age; further they conclude that low MNA values predict situations that still did not manifest pathologically in those variables which are components of the MNA score **(Alves de Rezende, et al, 2005)**. In another cross sectional study among 413 geriatric patients of Turkey, with aim to assess the nutritional status and its association with geriatric syndrome using MNA score found lower MNA score in older age group as compare to younger ones, attributing it to the various geriatric syndrome covering functional impairment, cognitive impairment, psychosocial factors which increase with the increasing age (**Saka, kaya, et al, 2010).**

Conclusion

Malnutrition is common in hospitalized patients as seen in this study showing statically significant association of older age and malnutrition as well as significant association of female gender with malnutrition. In addition to it a statistically significant (P value <0.000, r = -0.488) negative correlation between age and MNA score value was also the key finding of this study. This study was among the pioneer research conducted in central India on this topic, further research is warranted to establish the association of demographic characteristics and enable a quick and more effective screening process and further development of tools that will capture nutrition status of hospitalized patients out of intensive care unit. Nutrition screening is an important step in establishing the patients need for nutritional care. The results of this study will lead to increased awareness of the importance of nutritional care among hospitalized patients.

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