Prevalence of malnutrition in a tertiary care hospital in India

Chandrashish Chakravarty, Babita Hazarika[1], Lawni Goswami, Suresh Ramasubban

Abstract

Introduction: Malnutrition adversely affects clinical outcome of hospitalized patients. This observational prospective study was done to assess the prevalence of malnutrition and its grade among patients admitted in a mixed intensive care unit (ICU) of a tertiary care hospital in order to help devise a comprehensive nutrition program for the malnourished. **Materials and Methods:** A total of 500 sequential patients admitted to the ICU were screened on admission over a year period for malnutrition using the Subjective Global Nutritional Assessment (SGNA) score. Distribution of the degree of malnutrition according to co-morbidities was also documented. **Results:** Of the total, 198 (39.6%) patients were malnourished, including one patient qualifying as severely malnourished; 68% patients were male, however, there was no statistically significant difference between nutrition status between sexes. Hypertension, diabetes, and cancer were the three most commonly encountered co-morbidities among the malnourished. A total of 86% of all cancer patients admitted were malnourished against only 12% of trauma patients. **Conclusion:** This study showed that almost two-fifth of the patients admitted were malnourished in this tertiary care hospital and that there is an urgent need to develop a comprehensive nutritional care program in many such Indian ICUs.

Keywords: Indian intensive care unit, malnutrition, subjective global nutritional assessment

Introduction

Advancement in the field of medicine has increased the chances of survival of patients with a variety of diseases that were considered incurable earlier. This possibility also has greatly increased the number of patients seeking admission to the intensive care units (ICUs) of the hospitals. The prevalence of malnutrition is high in ICU patients. Patients being treated in ICU are considered as malnourished when their endogenous and exogenous supply of calories is not sufficient to meet their metabolic requirement. The prevalence of malnutrition has been estimated to be as high as 50% among acutely hospitalized adults, depending on the definition employed and the population assessed.[1-3]

Malnutrition is consistently associated with adverse clinical outcomes, including increased morbidity, mortality, and length of hospital stay as well as reduced quality of life.[4,5]

Various diseases commonly found in ICU patients cause stress on the body and bring about changes in substrate metabolism, thus leading to the deficiency of various nutrients. The incidence of malnutrition is significant in critical particularly in high-risk patients.[6] It is essential to identify malnourished patients and also patients at increased risk of malnutrition in order to devise a comprehensive nutrition care program. Nutrition societies across the world recommend nutrition screening tools to assess malnutrition in hospitalized patients, such as the Mini Nutritional Assessment (MNS) tool.[7]

The present study assessed the prevalence of malnutrition in patients hospitalized in ICU as the first step in devising a comprehensive nutritional care program.

From:
Departments of Critical Care and [1]Dietetics, Apollo Gleneagles Hospitals, Kolkata, West Bengal, India

Correspondence:
Dr. Chandrashish Chakravarty, Apollo Gleneagles Hospitals, CK-221, Salt Lake, Kolkata - 700 091, West Bengal, India. E-mail: chandrashish.c@gmail.com

Materials and Methods

Throughout the year, a sequential sample of 500 patients regardless of gender, ethnicity, or reason for hospitalization, who were admitted to a mixed ICU of a tertiary care hospital were included in the study. As part of routine screening, patients were screened for nutrition status by Subjective Global Nutritional Assessment (SGNA) score. On the basis of the features of history and physical examination, investigator identified an SGA rank, which indicated the patient's nutritional status. These categories included rating from 1 to 7 (well nourished = 6 or 7, mean continuous improvement; moderately malnourished = 3, 4, or 5, means no clear sign of normal status; and severely malnourished = 1 or 2, means significant physical sign of malnutrition).[8]

The SGNA score was calculated based on the medical history and physical examination of individual patient. The history was focused on 5 variables, namely, weight change/loss in previous 6 months and 2 weeks, change in dietary intake, presence of gastrointestinal symptoms, and change in functional capacity and co-morbidity, while physical examination was focused on decreased fat store/loss of subcutaneous fat and signs of muscle wasting.

Anthropometric measurements

The following parameters data were captured: Height, weight, and body mass index.

Clinical evaluation

Patients were evaluated for obvious signs and symptoms of malnutrition.

Statistical methods

Simple statistical principles of average and mean were employed in this study. A sample of 500 was considered sufficient to estimate the prevalence of malnutrition status and devise a comprehensive nutrition program at the hospital.

Results

The distribution of 500 ICU admitted patients according to nutritional status and age is presented in Table 1. The mean age of the population between male and female population were similar. There was only one severely malnourished male patient of age 45 years in the study. In the study, mean age of females was 60.03 (±12.18) years and that of males was 58.64 (±16.08) years.

The distribution of 500 ICU admitted patients according to nutritional status and gender is presented in Table 2.

Around two-thirds of the patient population (68%) was males. Overall, nourishment status was similar between males and females in the present study.

Table 3 summarizes the results of SGNA according to nutrition status and co-morbidity. The moderately nourished patients ranged from 15% (trauma) to 86% (cancer) and well-nourished patients ranged from 12% (cancer) to 85% (trauma) among various co-morbidities. Hypertension was the most widely seen co-morbidity among the study patients ($N = 140$). About equal number of hypertensive patients were distributed according to SGNA scoring (52% well-nourished and 48% moderately malnourished). Malnourishment was highest among cancer patients; 86% of these patients were moderately malnourished and 2% were severely malnourished). The SGNA scoring was similar for patients with co-morbidities such as hypothyroid, chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), and chronic liver disease (CLD).

Table 4 summarizes the results of SGNA according to sex, nutrition status, and co-morbidity. No gender specific

Table 1: Distribution of ICU patients according to nutrition status and age

	Males (Years±SD)	Females (Years±SD)
Well nourished	54.66±16.75	56.43±17.02
Moderately malnourished	64.98±12.70	61.63±15.64
Severely malnourished	45-	-

ICU: Intensive care unit; SD: Standard deviation

Table 2: Distribution of ICU patients according to nutrition status and sex

	Well-nourished	Moderately malnourished	Severely malnourished
Total	302	197	1
Female (%)	94 (31.13)	65 (32.99)	-
Male (%)	208 (68.87)	131 (66.49)	1 (100)

ICU: Intensive care unit

Table 3: Distribution of ICU patients according to overall nutrition status and co-morbidity

Condition	Well nourished N=302 (%)	Moderately malnourished N=197 (%)	Severely malnourished N=1 (%)
Hypertension	73 (52)	67 (48)	
Diabetes mellitus	79 (59)	55 (41)	
Cancer	6 (12)	43 (86)	1 (2)
Hypothyroid	5 (45)	6 (55)	
Chronic kidney disease	15 (48)	16 (52)	
Chronic obstructive pulmonary disease	8 (35)	15 (65)	
Chronic liver disease	3 (30)	7 (70)	
Trauma	52 (85)	9 (15)	
Others	226 (62)	137 (38)	

ICU: Intensive care unit

Table 4: Distribution of ICU patients according to gender, nutrition status and co-morbidity

Condition	Well nourished N=302 (%)		Moderately malnourished N=197 (%)		Severely malnourished N=1 (%)
	Females	Males	Females	Males	Male
Hypertension	27 (37)	46 (63)	26 (39)	41 (61)	
Diabetes mellitus	26 (33)	53 (67)	23 (42)	32 (58)	
Cancer*	3 (50)	3 (50)	9 (21)	33 (77)	1 (100)
Hypothyroid	4 (80)	1 (20)	4 (67)	2 (33)	
Chronic kidney disease	5 (33)	10 (67)	8 (50)	8 (50)	
Chronic obstructive pulmonary disease	2 (25)	6 (75)	8 (53)	7 (47)	
Chronic lung disease	2 (37)	1 (33)	0	7 (100)	
Trauma	8 (15)	44 (85)	5 (56)	4 (44)	
Others	70 (31)	156 (79)	49 (36)	88 (64)	

*The gender of one moderately malnourished cancer patient was not documented; ICU: Intensive care unit

pattern in the distribution of malnutrition among various co-morbidities was seen in the study, except that most trauma patients were males. All male patients (100%) with CLD were moderately malnourished (N = 7). Around 77% male cancer patients were moderately malnourished and 21% female cancer patients were moderately malnourished, while equal numbers of male and female patients (50%) were well nourished. The only patient who was severely malnourished was a male cancer patient.

Figures 1 and 2 show SGNA status of ICU admitted well-nourished and moderately nourished patients. Most (85%) of the trauma patients were well nourished. Most (86%) of the cancer patients were moderately malnourished.

Discussion

The present single-center screen of nutrition status among hospitalized patients in ICU estimated malnutrition risk. In our study, male patients outnumbered females in ICU admissions. Among the co-morbidities, malnutrition risk was highest among cancer patients, followed by CKD, CLD, and hypothyroidism. Various studies have estimated that about 30-50% of critically ill patients have clinical evidence of malnutrition.[9-12] These studies have also reported that the nourishment status of ICU patients generally deteriorates during the stay at the hospital, possibly due to inadequate nutritional supplementation.

Our results are consistent with previous reports. In the study by Morais *et al.*, patients were around 60 years old, with non-significant differences regarding gender and surgical/trauma category vs. medical cases.[13] In our study, older patients were more malnourished than younger patients and gender was not an influential factor among malnourished patients.
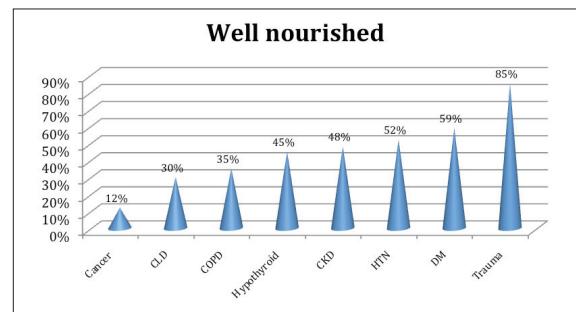

Figure 1: ICU admitted co-morbid patients according to SGNA status (well nourished)
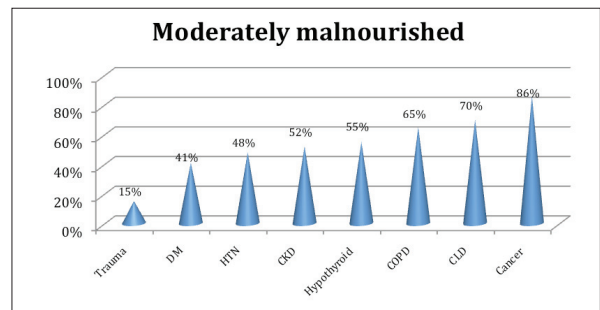

Figure 2: ICU admitted co-morbid patients according to SGNA status (moderately malnourished)

Malnutrition among hospitalized adults is a global problem.[14] In addition to its devastating effects on patients, malnutrition impacts significantly on the healthcare system. Malnourished patients have higher complication rates (including infections and organ failure), slower recovery, and higher rates of psychosocial difficulties. The present survey quantifies the problem of malnutrition in hospitalized ICU patients in this part of the world and represents the first step toward developing a comprehensive nutrition care plan.

Conclusion

It is extremely important to identify at-risk population and institute early nutritional intervention to prevent its devastating effects on the patients and the possible impact on healthcare system. Our study quantified

the problem of malnutrition in hospitalized patients in the ICU.

In our study, about 40% of ICU patients are malnourished. The comorbid conditions identified as at-risk included cancer, CLD, COPD, and CKD. Considering that the nourishment status of hospitalized patients generally deteriorates during the stay at the hospital, possibly due to inadequate nutritional supplementation, this prevalence is substantial. There is an urgent need to develop a comprehensive nutrition care plan.

References

1. Correia MI, Campos AC, ELAN Cooperative Study. Prevalence of hospital malnutrition in Latin America: The multicenter ELAN study. Nutrition 2003;19:823-5.
2. Edington J, Boorman J, Durrant ER, Perkins A, Giffin CV, James R, et al. Prevalence of malnutrition on admission to four hospitals in England. The Malnutrition Prevalence Group. Clin Nutr 2000;19:191-5.
3. Beghetto MG, Luft VC, Mello ED, Polanczyk CA. Accuracy of nutritional assessment tools for predicting adverse hospital outcomes. Nutr Hosp 2009;24:56-62.
4. Goiburu ME, Goiburu MM, Bianco H, Díaz JR, Alderete F, Palacios MC, et al. The impact of malnutrition on morbidity, mortality and length of hospital stay in trauma patients. Nutr Hosp 2006;21:604-10.
5. Rüfenacht U, Rühlin M, Wegmann M, Imoberdorf R, Ballmer PE. Nutritional counseling improves quality of life and nutrient intake in hospitalized undernourished patients. Nutrition 2010;26:53-60.
6. Mehanna H, Nankivell PC, Moledina J, Travis J. Refeeding syndrome–awareness, prevention and management. Head Neck Oncol 2009;1:4.
7. Kondrup J, Allison SP, Elia M, Vellas B, Plauth M, Educational and Clinical Practice Committee, European Society of Parenteral and Enteral Nutrition (ESPEN). ESPEN guidelines for nutrition screening 2002. Clin Nutr 2003;22:415-21.
8. Detsky AS, McLaughlin JR, Baker JP, Johnston N, Whittaker S, Mendelson RA, et al. What is subjective global assessment of nutritional status? JPEN J Parenter Enteral Nutr 1987;11:8-13.
9. Imoberdorf R, Meier R, Krebs P, Hangartner PJ, Hess B, Stäubli M, et al. Prevalence of undernutrition on admission to Swiss hospitals. Clin Nutr 2010;29:38-41.
10. Liang X, Jiang ZM, Nolan MT, Wu X, Zhang H, Zheng Y, et al. Nutritional risk, malnutrition (undernutrition), overweight, obesity and nutrition support among hospitalized patients in Beijing teaching hospitals. Asia Pac J Clin Nutr 2009;18:54-62.
11. Cereda E, Lucchin L, Pedrolli C, D'Amicis A, Gentile MG, Battistini NC, et al. Nutritional care routines in Italy: Results from the PIMAI (Project: Iatrogenic MAlnutrition in Italy) study. Eur J Clin Nutr 2010;64:894-8.
12. Driver AG, McAlevy MT, Smith JL. Nutritional assessment of patients with chronic obstructive pulmonary disease and acute respiratory failure. Chest 1982;82:568-71.
13. Morais AA, Faintuch J, Caser EB, Costa DS, Pazolini BA, Oliveira AC. Nutritional support for critically ill patients: Does duration correlate with mortality? J Crit Care 2011;26:475-81.
14. Giryes S, Leibovitz E, Matas Z, Fridman S, Gavish D, Shalev B, et al. Measuring nutrition risk in hospitalized patients: MENU, a hospital-based prevalence survey. Isr Med Assoc J 2012;14:405-9.

New features on the journal's website

Optimized content for mobile and hand-held devices
HTML pages have been optimized for mobile and other hand-held devices (such as iPad, Kindle, iPod) for faster browsing speed.
Click on **[Mobile Full text]** from Table of Contents page.
This is simple HTML version for faster download on mobiles (if viewed on desktop, it will be automatically redirected to full HTML version)

E-Pub for hand-held devices
EPUB is an open e-book standard recommended by The International Digital Publishing Forum which is designed for reflowable content i.e. the text display can be optimized for a particular display device.
Click on **[EPub]** from Table of Contents page.
There are various e-Pub readers such as for Windows: Digital Editions, OS X: Calibre/Bookworm, iPhone/iPod Touch/iPad: Stanza, and Linux: Calibre/Bookworm.

E-Book for desktop
One can also see the entire issue as printed here in a 'flip book' version on desktops.
Links are available from Current Issue as well as Archives pages.
Click on View as eBook