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Research Article

PREVALENCE OF NUTRITIONAL DEFICIENCIES IN CRITICALLY ILL PATIENTS ADMITTED TO INTENSIVE CARE UNIT

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ABSTRACT

Objective: This study was conducted to assess the incidence of the existing malnutrition in critically ill patients who are admitted to ICU. So that this can help in improving the nutrition therapy in these critically ill patients, and also to identify the comorbidities which as associated with severe malnutrition.

Methods: All patients who are above 18 years admitted to ICU irrespective of sex, diagnosis, and severity of disease are assessed for nutritional status with a subjective global assessment score within 24 h of admission.

Results: In males, severe malnourishment was noted in the elderly age group with a mean age of 64.33±17.32 compared to patients with <60 years. In female patients, moderately nourished patients were older with a mean age of 61.37±12.69. There is no difference between males and females in the well-nourished and severely malnourished groups. However, in the moderately nourished group, females are more than males (32.09% vs. 24.92%). Diabetes mellitus seems to be the most common comorbidity noted. In diabetes mellitus, 81.39% of patients were severely malnourished.

Conclusion: It is shown that most of the patients admitted to the ICU present with pre-existing malnutrition. Hence, nutrition therapy plays an important role in the management of these patients.

Keywords: Malnutrition, Subjective global assessment, Critically ill.

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INTRODUCTION

Health-care accessibility in modern days has an increased chance of survival, but malnutrition is always linked with an increased risk of mortality and morbidity [1]. The prevalence of malnutrition in a tertiary care hospital is as high as 50% [2,3]. Malnutrition also increases the length of hospital stay, increases the cost of health care, and increases dependence and reduced quality of life [4]. The prevalence of malnutrition ranges between 38% and 78% in critically ill patients. About 30% of the patients are admitted with malnutrition, and about 60% of the patients develop malnutrition during admission [5]. According to a consensus statement by the Academy of Nutrition and Dietetics and the American Society for Parenteral and Enteral Nutrition, malnutrition is defined as the presence of any two or more of these entities: insufficient energy, intake, weight loss, loss of muscle mass, loss of subcutaneous fat, localized or generalized fluid accumulation, or decreased functional status [6]. Critical illness is defined as a life-threatening condition caused by infection, trauma, or any medical illness. There is a massive surge of proinflammatory mediators which leads to increase catabolism which is an adaptive response of the body. There is also a production of anti-inflammatory mediators to counteract it [7]. This proinflammatory surge and reduced intake may lead to muscle wasting in critically ill patients with a reduction in muscle fiber cross-sectional area of 3–4%/day [8]. Most of the mortality in ICU is due to acquired causes which also include malnutrition. Tumor necrosis factor-alpha is known as cachexin. Tumour Necrosis Factor-alpha known as cachexin, is released within few hours of critical illness which may cause reduced intake [9]. Critically ill patients admitted in ICU will require approximately 25 kcal/kg to 50 kcal/kg as a nutritional requirement which has to be addressed immediately to prevent malnutrition. Due to various reasons such as severe shock, route of administration, and availability of formulas, patients may not meet the required nutrition. Assessment of the nutritional status of the patient is important in the ICU. Various nutritional screening tools have been recommended, such as nutritional risk screening 2002 (NRS 2002), NUTRIC score, mini-nutritional assessment (MNS) tool, and subjective global assessment (SGA). SGA includes three classes as follows: class C – severe malnutrition, class B – moderate malnutrition, and class A – no malnutrition. SGA is a simple tool which can be easily implemented for screening critically ill patients. In a study, the use of SGA in critically ill patients was more favorable than other assessment tools [10]. This study assessed the prevalence of nutritional status of the patients admitted in a tertiary care medical college hospital ICU using SGA.

METHODS

Patients who were admitted to the intensive care unit of our teaching medical college hospital from January 2024 to June 2024 were assessed for nutritional status within 24 h of admission with an SGA form. Patients were assessed irrespective of age, sex, and comorbid diseases and diagnosis.

A clear dietary history such as vegetarian/non-vegetarian, any food allergies, 24-h recall of diet, adequacy of diet for the past 2 weeks, and any prolonged starvation for the past 2 weeks is also noted. Symptoms such as nausea, vomiting, diarrhea, and their severity are also noted. Weight gain or loss over the past 6-month period is also noted to assess the severity of malnutrition.

In physical examination, muscle mass, muscle wasting, and the presence of edema are also assessed.

All the dietary histories are asked from the conscious patients themselves, and for unconscious patients, dietary histories are collected from the next of kin.

All these assessments are noted in the standardized SGA form.

Based on these criteria, SGA is classified as follows:

A. Well nourished
B. Moderately malnourished
C. Severely malnourished

Simple statistical parameters such as mean and average between the groups of the SGA were used for computing results.

RESULTS AND DISCUSSION

In our study, a total of 519 patients were included for analysis. The mean age was 47.42±16.50 in males and 47.25±18.05 in females in well nourished (A), 58.61±17.51 in males and 61.37±12.69 in females moderately malnourished (B), and 64.33±17.32 in males and 54.75±23.89 in females in severely malnourished (C) groups (Table 1). In the well-nourished (A) and moderately malnourished (B) group, the mean age was comparable in males and females. Our study showed that elderly male patients were more malnourished compared to female patients. A study published by Morais *et al*. showed that patients severely malnourished were elderly patients with an age group of more than 60 years [11]. Our study has 68.78% of the male population compared to 31.21% female population. This showed that patients admitted with critical illness were predominantly male, in males well nourished (72.54%) were more compared to moderately nourished (24.92%) and severly malnourished (2.52%). In females well nourished (62.96%) were more than moderately nourished (32.09%) and severly malnourished (4.92%) (Table 2). When comparing the severely malnourished group, there is a slight increase in the percentage of female patients compared to males (4.92% vs. 2.52%). Bianca *et al*. did a cross-sectional study in Brazil which demonstrated severe malnourishment was observed in males than females [12]. This difference may be due to the social status which is prevalent in our country compared to other countries.

Out of 519 patients, 364 patients had comorbidities such as chronic kidney disease (CKD), diabetes mellitus (DM), systemic hypertension (HTN), and a few patients with COPD and CVA. We took DM, HTN, and CKD for analysis because of its common prevalence in our community. Our study showed severely malnourished accounted for 35.43% of patients with comorbidities when compared to 46.42% and 18.13% in well-nourished and moderately malnourished patients, respectively (Table 3 and Fig. 1). Out of 365 patients, 45.32% were with DM which was most encountered comorbidity. 63.63% of patients with DM were severely malnourished in comparison to 32.12% and 4.24% in well-nourished and moderately nourished patients, respectively. Our study also had comparable results of Junaid *et al*. study which showed malnutrition is more common in DM patients compared to control [13]. Our study had 11.26% of patients with CKD, of which 53.65% were well nourished compared to 4.87% and 41.46% in moderately nourished and severely malnourished patients, respectively. Malnourishment is more common with CKD and accounts for 30–60% [14]. Even though our study showed more well-nourished patients, the incidence of malnourishment was comparable to the study by Miao *et al*. 43.40% of patients accounted for HTN patients, 59.49% were well nourished when compared to 36.07% and 4.43% were moderately nourished and severely malnourished patients, respectively.

35.43% of the patients accounted for severely malnourished patients. 81.39% of the patients in the severely malnourished group were DM patients, which show clearly that because of the multiple pathophysiological mechanisms in DM lead to severe malnourishment. Hence, there is an increased incidence of nutritional deficiency in DM patients (Fig. 2).

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

	Males (Years±SD)	Females (Years±SD)
Well nourished (A)	47.42±16.50	47.25±18.05
Moderately malnourished (B)	58.61±17.51	61.37±12.69
Severely malnourished (C)	64.33±17.32	54.75±23.89

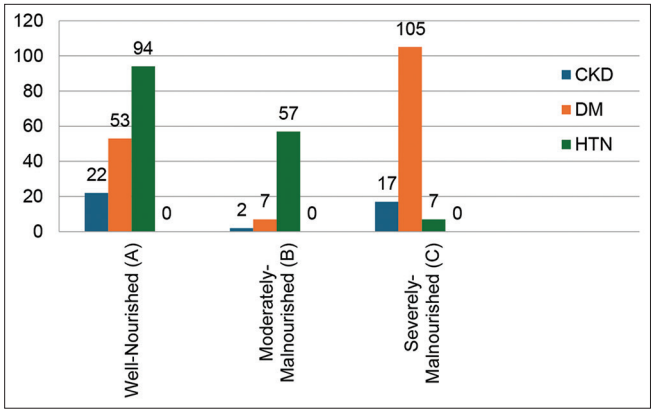

Fig. 1: Distribution of ICU patients according to overall nutrition status and comorbidity

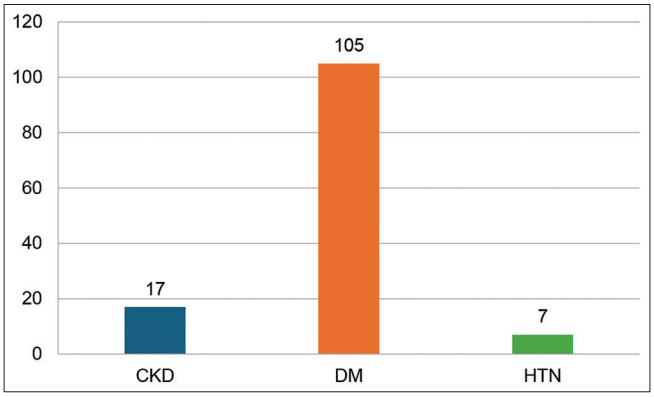

Fig. 2: Distribution of comorbidity among severely malnourished

Nutrition plays an important role in the improvement of patients who are critically ill. The prevalence of malnutrition in critically ill patients is more than in patients admitted to general wards [15].

When we talk about the assessment tool, SGA is a commonly used tool for nutritional assessment in critically ill patients. SGA is a well-validated tool in critically ill patients but has its own limitations such as measuring the anthropometric parameters in sedated and ventilated patients. Other scores such as Nutritional Risk Screening 2002 (NRS 2002), NUTRIC score, and MNS tool can be used but need a dedicated nutritionist for assessment.

Nutritional therapy is needed for all patients who are admitted to ICU. Moreover, nutrition must be initiated within 48 h of admission [16]. According to ESPEN guidelines, early oral nutrition must be initiated, if oral initiation is not possible, enteral nutrition should be started through an oro-gastric tube within 48 h of admission. It is preferable to go for post-pyloric feeds to prevent aspiration and intolerance. If there is a contraindication for enteral nutrition, start parenteral nutrition within 3–7 days than not starting nutritional therapy [17]. There is no mortality difference between continuous feeding and bolus feeding,

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

Gender	Well-nourished (A)	Moderately malnourished (B)	Severely malnourished (C)	Total
Male (%)	259 (72.54)	89 (24.92)	9 (2.52)	357 (68.78)
Female (%)	102 (62.96)	52 (32.09)	8 (4.92)	162 (31.21)
Total	361 (69.55)	141 (27.16)	17 (3.27)	519

Table 3: Distribution of ICU patients according to overall nutrition status and comorbidity

Comorbidity	Well nourished (A)	Moderately malnourished (B)	Severely malnourished (C)	Total (%)
CKD (%)	22 (53.65)	2 (4.87)	17 (41.46)	41 (11.26)
DM (%)	53 (32.12)	7 (4.24)	105 (63.63)	165 (45.32)
HTN (%)	94 (59.49)	57 (36.07)	7 (4.43)	158 (43.40)
Total	169	66	129	364

which is better than bolus feeds, but continuous feeds have been shown to reduce the regurgitation and incidence of diarrhea [18]. In case of intolerance to improve motility, prokinetics such as metoclopramide can be used. In critically ill patients, it is important to start with hypocaloric feeds (<70% of energy expenditure), and full feeds must be achieved by 3–4 days [19]. Both in enteral nutrition and parenteral nutrition, the requirement of carbohydrates should not exceed 5 mg/kg/min, lipids should not exceed 1.5 g/kg/day, and proteins can be started with 1 gm/kg and can be increased as per requirement. In critically ill patients with trauma and >20% burns, glutamine is added to enteral nutrition for the initial 5–7 days, not recommended for other critically ill patients [20]. In patients with shock, EN can be delayed or should be delayed. EN can be delayed if the gastric aspirate is > 500 ml/6 h. For those patients who are not eligible to start early nutrition, it is better to start trophic feeds at 20 ml/h to maintain gut mucosal integrity and prevent trans gut translocation of bacteria [21]. Carbohydrates should provide 70% of caloric requirements, protein requirement is 1.2–1.6 g/kg/day, and 30% of energy should be provided by lipids [22]. Malnutrition increases complications, increases the length of hospital stay, and increases the cost of treatment.

CONCLUSION

Based on the study, we conclude that most of the patients who are admitted to ICU have pre-existing malnutrition across both genders. Those patients who have DM as comorbidity have severe malnutrition. This shows the importance of early nutritional therapy in critically ill patients for early recovery and prevention of complications.

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