

Nutrition Management Practises in Critical Care in Tertiary Hospitals - A Survey from India

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Abstract:

Introduction: To observe nutrition practises followed by intensive care units (ICUs) of tertiary care hospitals of various sizes.

Method: A paper-based survey was performed in 20 tertiary care ICUs across Mumbai, India. ICUs with as few as 9 beds and as many as 100 beds participated in the survey. ICUs were classified as small, medium and large based on the number of beds.

Results: No ICU had occupancy of less than 63% at the time of the survey. Most ICUs, regardless of size, reported clear fluid as the preferred first feed and bolus as the preferred EN. Most large hospital ICUs prescribed up to 100% formula feeds as opposed to most small and medium ICUs. Only two large ICUs reported that they administer dietician prescribed formula feeds, whereas most ICUs administered physician prescribed formula feeds.

Conclusion: The choice of bolus as EN indicates a preference for kitchen feeds. This may be attributed to cost of formula feeds. Most ICUs reported that ICU physicians recommended formula feeds.

Keywords: Nutrition, feed, ICU, survey, EN, PN.

Introduction

Ensuring appropriate nutrition is one of the most important aspects of the care offered to patients during their stay at a hospital. Adequate nutrition is critical to recovery and general well-being. It is difficult to imagine that even in hospitals, which administer overall care and employ numerous staff and equipment for this purpose, cases of malnutrition are not uncommon. Butterworth reported in as early as 1974 (Butterworth Jr., 2005) that malnutrition exists even in a hospital setting. Tappenden *et al.* (2013) observed that many studies have since documented not only the existence, but also the impact of malnutrition on patient outcome. It is now a well-reported fact that about 30% of incoming patients are malnourished on arrival. Recent studies such as Coats *et al.* (1993), Kondrup *et al.* (2002), Correia & Waitzberg (2003), Barker, Grout & Crowe (2011), Lim *et al.* (2012) and Agarwal *et al.* (2013) have linked malnutrition to increased length of stay, frequent readmissions, and increased risk of mortality along with higher cost to the hospital.

In critical care patients, malnutrition poses an even greater risk. In as early as 1977, Hill *et al.* identified that almost 50% of surgical patients in hospitals suffered from malnutrition. In the 90s, Christman & McCain (1993) and Giner *et al.* (1996) found that even with two decades of

nutritional awareness, malnutrition continued to remain a major issue in the care of critically ill patients during their hospital stay. Intensive care units (ICUs) have adopted administration of parenteral and enteral feeds to ensure appropriate nutrition in the critically ill. However, recent studies by Kinn & Scott (2001) and Quirk (2013) have found that even on adoption of these feeding practises, patients in ICUs still suffer from malnutrition. Significant occurrence of malnutrition in ICU patients is attributed to delayed screening and dietician consult.

On being identified, malnutrition is generally treated by administering feeds recommended by physicians or dieticians. It has been reported by experts in various guidelines (Marik & Zaloga, 2001; Heyland *et al.*, 2003; Kreymann *et al.*, 2006; Singer *et al.*, 2009; Martindale *et al.*, 2009) that enteral feed (EN) is the preferred nutrition for ICU patients and its early administration promotes faster recovery. It may be administered in the form of bolus or as continuous feed. In many developing countries, hospitals still administer kitchen feeds instead of formulae-based feeds due to numerous reasons that also include financial conditions.

It is observed that due to the presence of multiple caregivers in the ICU, such as physicians, dieticians, nutritionists, nurses, the formulation and fixing of diet plans is often

delayed. Also, the responsibility of nutrition management is often shared among caregivers, which may cause ignorance in recommending or starting feeds even after malnutrition is identified. In tertiary hospitals in India, physicians and dietitians generally prescribe a diet plan with the type and amount of feed. The use of kitchen feed is prevalent.

In order to observe the nutrition management practises followed in ICUs across most tertiary care hospitals, we undertook a survey of nineteen hospitals across Mumbai, India. The objective of this survey was to identify and present how ICUs of all sizes-small, medium, and large-prescribed, administered, and monitored feeds to patients.

Method

A paper-based survey was conducted in twenty tertiary care hospitals with ICUs of various sizes across Mumbai, India in August 2016. The survey contained questions regarding various nutrition management steps and practises and the responses were personally provided by physicians at the respective hospitals. Figure 1 is the survey questionnaire used to collect the data.

For easy presentation of the collected data, the ICUs have been classified based on the number of beds as small, medium, and large (see Table 1).

The number of ICUs that fall in each category has been presented in figure 2. In the results section, the data collected for each parameter has been presented for each type of ICU.

Table 1 ICU Classification Criterion

Classification of ICU	Number of Beds
Small	<20
Medium	20 to 50
Large	≥50

Survey Questionnaire

Name of Hospital	
Designation of person providing response	
Number of beds in the ICU	
What is the occupancy?	
On an average how many days a patient stays in the ICU?	
How many tube feeds happening per day? (NG, NJ and PEG)	
Information regarding ICU practises	
What is the first preferred source of calorie, protein and fluid for a patient (PN, normal saline, etc.)?	
Which are the common PN modalities used in the ICU?	
On an average how many days a patient will be on PN?	
Who takes the decision to start feeding for a stable patient?	
What is the first feed given to the patient (in general)?	
How many feeds do you provide in a day? (number/volume ml)	
What is the type of feeding used (bolus/intermittent/continuous/cyclic)?	
Is elevation of bed mandatory during tube feed?	
What are the clear fluids you recommend and why?	
What are the soft diets you recommend and why?	
On an average how many days a patient will take to eat kitchen foods?	
Do you use formula feeds? What percentage?	
Do you combine formula feeds with kitchen feed? If yes, why?	
Do you monitor achievement of calorie per day against set target?	
Which doctor recommends formula feeds regularly?	
What is the role of the dietician in the ICU (nutrition assessment, monitoring, etc.)?	
Information about the challenges/concerns	
What are your concerns while feeding?	
(What you want to avoid?)	
What are the common challenges /problems you face?	
What could be the reasons?	
How are you managing the same?	
About oral feeding patients	
What are the challenges in achieving targeted calorie and protein delivery? (plate wastage/vomiting/lack of appetite/taste compliance)	
How many nurses manage the ICU by 24*7 and who are they?	

Figure 1: Survey Questionnaire

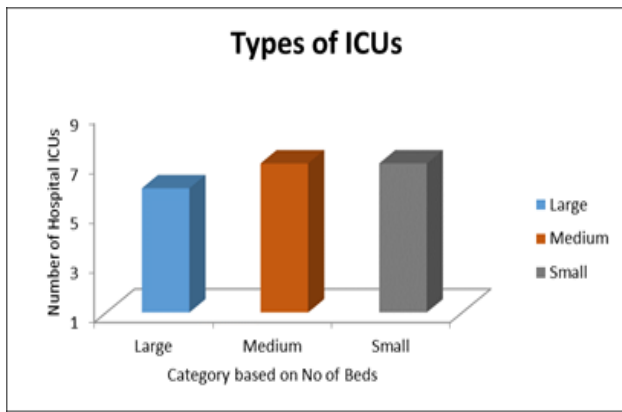


Figure 2: Types of ICUs Based on Number of Beds

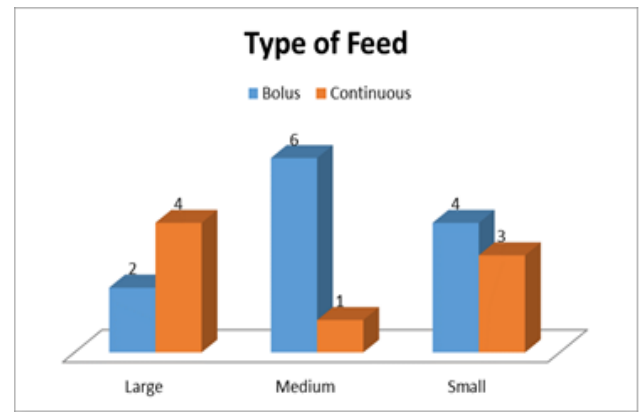


Figure 6: Type of Enteral Feed Administered

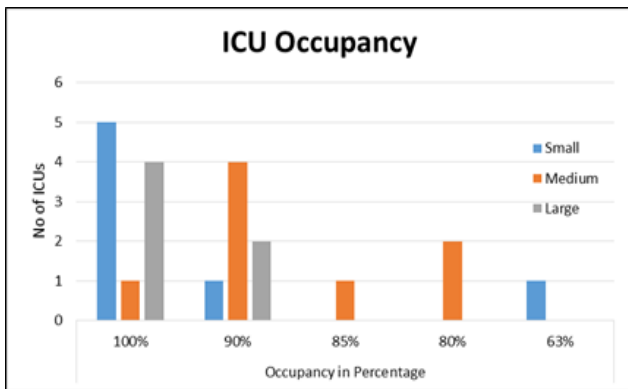


Figure 3: Occupancy in Different Types of ICUs

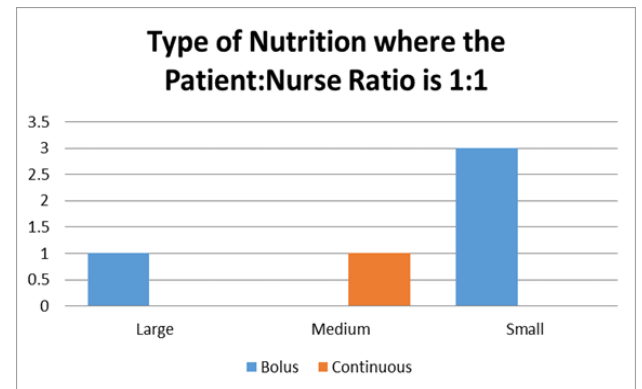


Figure 7: Type of Feed Administered in ICUs with Patient-Nurse Ratio of 1:1

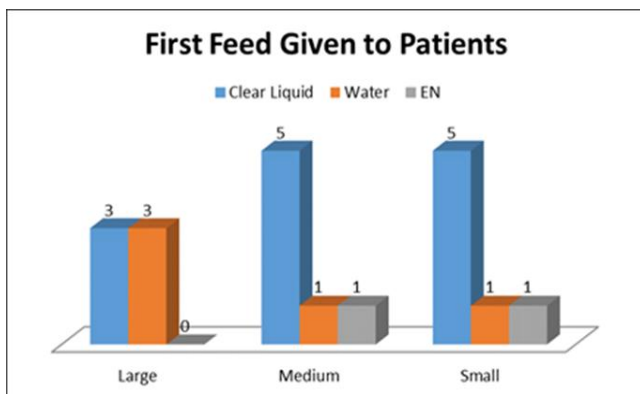


Figure 4: Type of First Feed Used across Hospitals

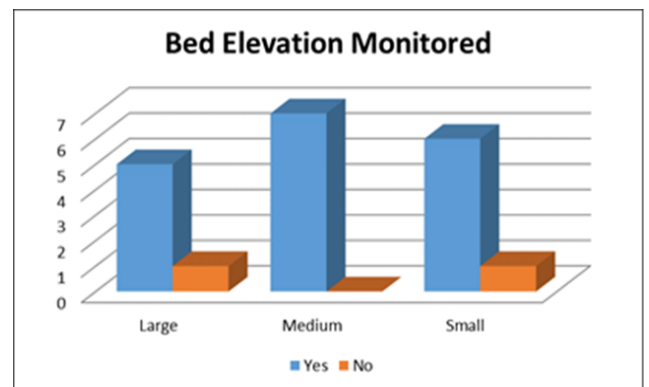


Figure 8: Whether Head Elevation is Mandatory during Tube Feed

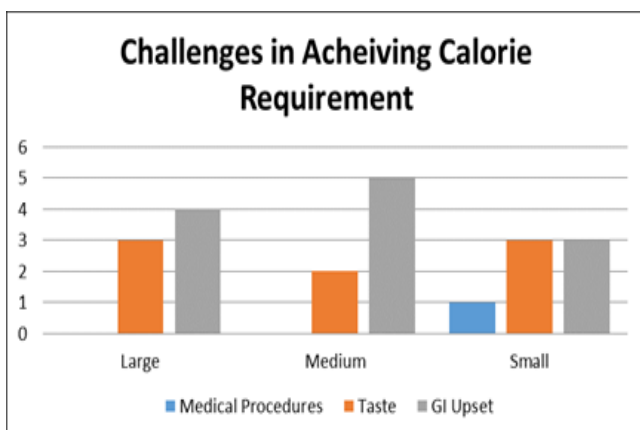


Figure 5: Challenges Faced by Caregivers in Achieving Nutrition Requirement of Patients on Oral Feed

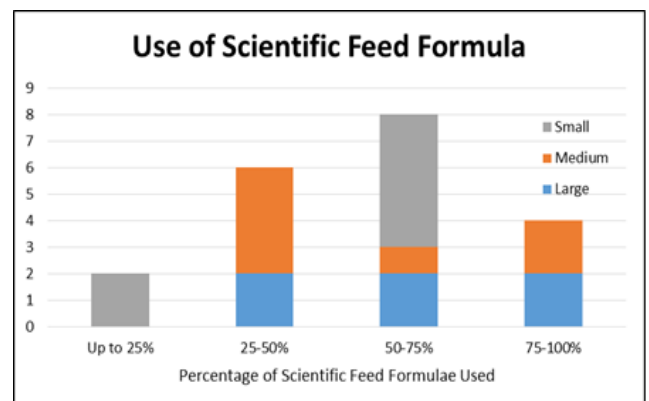


Figure 9: Use of Scientific Formulae-Based Feeds for EN

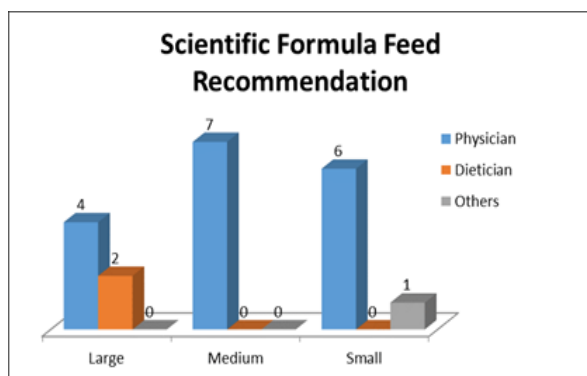


Figure 10 Who Recommends Scientific Formula Feeds

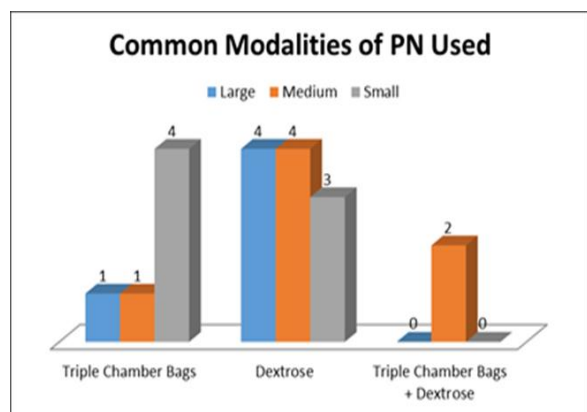


Figure 11 Common Parenteral Used in Different Types of ICUs

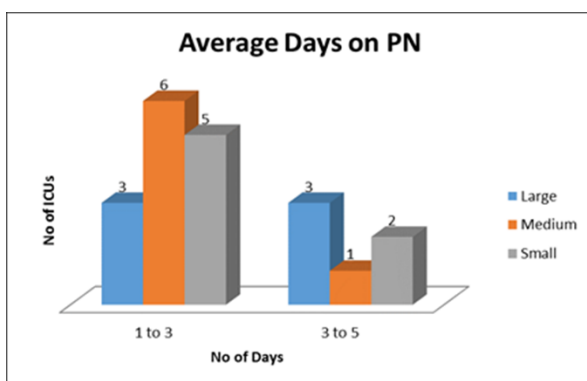


Figure 12 No. of Days for which Parenteral Feed is administered

Results & Discussion

Seven small, seven medium, and six large hospitals participated in the survey. Almost all large and small ICUs had 100% occupancy, whereas a variance was seen in medium-sized ICUs (see figure 3). Those ICUs that did not report full occupancy had no less than 63% occupancy at the time of this survey.

The first feed administered to patients in large, medium, and small ICUs was clear liquid. The next preferred first feed across all types of ICUs was water, followed by enteral feed (EN), which was only administered as first feed in 14%

small and medium ICUs. Figure 4 presents the data we collected in our survey.

Oral feed was rarely administered to critical care patients. The most common concern of caregivers in administering oral feed was gastrointestinal intolerance (see figure 5). This affected the achievement of calorie and protein requirement even after regular and monitored feed. The taste of the feed being administered was also a significant challenge in achieving nutrition requirements.

The method of enteral feed administered in most large ICUs was continuous feeding, whereas in most small and all but one medium ICU it was bolus feeding (see figure 6). Moreover, of all the twenty ICUs that participated in this survey, four had a patient-nurse ratio of 1:1. In these ICUs, the preferred feed type is illustrated in figure 7. Among these, the medium ICU preferred continuous feed whereas all small and large ICUs preferred bolus.

Our survey reveals that with over 80% of the beds being occupied, most ICUs managed to provide bolus feed to patients and that kitchen feed is preferred over scientific formula nutrition (formula feeds). For high-risk patients who demonstrate intolerance to bolus gastric EN, however, the American Society for Parenteral and Enteral Nutrition (ASPEN) recommends that the delivery of EN should be switched to continuous infusion.

Almost all ICUs across all categories that participated in the survey had mandatory head elevation during tube feed (figure 8).

When the use of formula feeds as EN was observed, it was found that all large ICUs administer more than 25% formula feeds. Most medium ICUs administer 25-50% formula feeds as EN and most small ICUs use 50-75% formula feeds. It is also worth noting that most large ICUs used 100% scientific formula feeds and the largest number of ICUs that participated in the survey, regardless of type, only used 50-75% scientific formula feeds (see figure 9).

In most ICUs, scientific formula feeds were administered based on the recommendation of physicians. Although dieticians were consulted as well, the ICU physicians took the final call regarding formula feeds. In only two large ICUs, dieticians took the final call regarding formula feeds (see figure 10). It is noteworthy that it was only in large ICUs that dietician prescribed feeds were used for nutrition management of critically ill patients. Small and medium ICUs, however, administered physician prescribed formula feeds.

Many hospitals use dextrose as parenteral feed and about 40% use triple chamber bags. Most ICUs preferred dextrose and two medium ICUs in our survey administered a

combination of triple chamber bags and dextrose. The results of our survey are presented in Figure 11.

Most medium and small ICUs reported that patients were administered parenteral feeds for 1 to 3 days as shown in figure 12. Fifty percent of large ICUs that participated in this survey reported that they administered PN for 1-3 days and the other 50% for 3-5 days. However, it should be noted that ICUs reported that the number of days for which the feed is administered depends on the patient's condition.

Conclusion

In the present survey, we attempted to observe nutrition management practises followed by different ICUs of various sizes across the city. Most ICUs, regardless of type, had similar feed preferences for first feed and similar concerns for calorie achievement. Also, the preferred type of feed was bolus in case of most ICUs.

With regards to scientific formula-based feeds, we observed maximum variance in the preferences of different types of ICUs, which most likely indicates financial reasons as a significant cause of this disparity. Most ICUs that participated in this survey preferred dextrose as PN. All the ICUs that participated in our survey consulted dieticians for formula feeds. However, surprisingly, only two large ICUs reported administering dietician prescribed feed for their patients and all others, save for one small ICU, reported that ICU physician prescribed formula feed was administered.

Ethics approval

No ethics approval was required for this study since no patient data was accessed or used and no live tests were performed.

Conflicts of Interest: None

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