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Original Research Article

To analyse the nutrition/ Feeding initiated within 24 hours of admission in critical care unit

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ABSTRACT

Introduction: For critically ill patients admitted to the vital Care Unit (CCU), the first 24 hours after starting feeding are vital. By using a feeding protocol, the research attempts to evaluate the frequency of early feeding initiation and nutrition adequacy targets in order to address the widespread issue of inadequate nutrition. Even though there are constant discussions about the best feeding plans, following basic guidelines is essential. This study explores the effects of early nutrition beginning, acknowledging its importance in offering strong nutritional support for better outcomes in CCU patients. It is in line with guidelines that advocate early enteral feeding.

Materials and Methods: Over the course of a month, 200 patients admitted to the Critical Care Unit (CCU) participated in a prospective, randomized, parallel-controlled clinical experiment. Data from patient records in the Solace hospital databases were used to analyze feeding procedures, including parenteral and enteral nutrition. Relationships between feeding modalities, patient outcomes, and early feeding initiation were investigated using statistical analysis.

Results and Discussion: 42.5% of the 200 patients started getting nutrition within 24 hours, demonstrating how urgently nutritional care is needed. A range of medical problems, such as diabetes and hypertension, were noted in the individuals. Feeding techniques included everything from liquid diets to customized plans like FD Soft DD and FD-CKD. The findings supports early enteral nutrition guidelines, which emphasize the critical role that early feeding plays in promoting immune function, lowering complications, promoting wound healing, and enhancing overall patient outcomes. Further investigation into the long-term consequences of early nutrition introduction may be necessary to have a thorough grasp of patient recovery and overall well being. Our comprehension of the intricate connection between a patient's results while receiving critical care and the early commencement of feeding is improved by this study.

Conclusion: This study highlights how crucial it is to start nutrition as soon as possible in the critical care unit (CCU) because it has a significant impact on patient outcomes, such as fewer problems and faster wound healing. The customized feeding strategy emphasizes the long-term advantages of early nutritional interventions and is backed by a wide spectrum of medical specialties. Subsequent investigations ought to concentrate on examining the enduring consequences and compliance with protocols to guarantee all-encompassing and prompt nutritional approaches in critical care supervision.

1. Introduction

Critically sick patients hospitalized to the intensive care unit (ICU) frequently have inadequate nutrition, thus it's crucial to provide these patients with stronger nutritional support. When a patient is seriously unwell, enteral feeding is the initial option for nutritional assistance.[1]

Initiating nutrition within the first 24 hours in the critical care unit is vital for patient care. While the optimal feeding

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strategy is debated, there are fundamental principles to follow. Medical nutrition therapy (MNT) is crucial, and feeding protocols increase calorie delivery and reduce patients unable to be fed enterally.[2] Guidelines recommend early enteral nutrition (EN) within 24-48 hours of critical illness, with vigilant monitoring. A systematic approach involving all ICU professionals is essential for successful EN implementation, along with regular updates and audits for safety and efficiency.[3] The management of medical nutrition for critically ill patients remains a significant challenge. However, numerous trials have shed light on assessing the nutritional needs of patients during their time in the intensive care unit (ICU), thereby improving our understanding of their physiological requirements.[4] Tailoring MNT to diverse patient needs and considering specific requirements when selecting feeding products are crucial. Managing EN requires a systematic approach involving all ICU professionals, incorporating practical approaches proposed in guidelines and regular updates. Therefore, early nutrition initiation and adapting MNT to specific patient requirements are critical in the first 24 hours in the critical care unit.[3]

In critical care unit, initiating optimal nutrition within the first 24 hours is crucial. The critical care unit is where healthcare professionals balance life and severe illness, addressing immediate issues and nourishing the body for healing.[5]

Early feeding and nutrition initiation are crucial in critical care. This phase influences recovery, morbidity, mortality, and long-term well-being. Timely nutritional support maintains organ function, immune competence, and metabolic stability—key components in critical care management.[6] Micronutrient deficiencies are prevalent in critically ill patients, as evidenced by lower plasma levels of selenium, β-carotene, vitamin C, and vitamin E compared to healthy controls. The repeated measurements within the first week of ICU admission reveal consistently suboptimal levels of key micronutrients, such as selenium, β-carotene, vitamin C, E, B1, and B6. Notably, vitamin B1 deficiency is a common occurrence in the ICU, underscored by low thiamine plasma levels reported in ICU patients.[7] As critically ill patients face unique challenges in nutrient metabolism, addressing micronutrient status becomes integral to comprehensive critical care. Acknowledging the potential for micronutrient deficiencies in critical care unit is crucial for timely interventions and improved patient outcomes.[8]

ESPEN guidelines stress early nutrition initiation within 24-48 hours for critically ill patients. Customized plans based on diverse needs, clinical conditions, and tolerances are prioritized. Adequate protein, tailored energy intake, and regular monitoring are emphasized. Fluid management and transitioning to oral intake are guided, providing a comprehensive nutrition care approach.[9] As per the ESPEN guidelines on EN, inadequate nutrient provision can lead to undernutrition within 8-12 days after surgery and/or ICU admission.[10] ESPEN guidelines highlight that managing CIF requires the utilization of advanced technologies, a multidisciplinary and multiprofessional approach, and expertise in caring for gastrointestinal diseases and providing HPN support.[11]

Early feeding and nutrition interventions in the first 24 hours in the Critical Care Unit (CCU) are pivotal due to increased metabolic demands and stress responses. Timely nutritional support is crucial in counteracting the physiological cascade, supporting the immune system, preserving lean body mass, and maintaining the gastrointestinal tract. Early nutrition plays a pivotal role in supporting the immune system, preserving lean body mass, and maintaining the integrity of the gastrointestinal tract. By supplying essential nutrients, it helps reduce the risk of complications such as infections and contributes to achieving optimal energy balance, which is vital for patients requiring mechanical ventilation. Moreover, early nutrition has been linked to improved wound healing, enhanced neurological recovery, and an overall decrease in morbidity and mortality rates.[12]

Essentially, the first 24 hours in the CCU are a critical window for comprehensive interventions addressing the nutritional needs of critically ill patients, impacting long-term outcomes and recovery trajectory.[13]

2. Objectives

The key objective of the research study was to

1. To evaluate the impact of implementing a feeding protocol within CCU.
2. To assess the nutrition adequacy targets within the first 24 hours of admission.
3. To assess the prevalence of early feeding initiation.

3. Materials and Methods

This was a prospective, randomized, parallel-controlled, single-blind, interventional clinical trial. This research conducted a retrospective analysis of 200 patients admitted to the hospital over a one-month period, with a specific focus on those entering the Critical Care Unit (CCU). The study aimed to investigate the impact of early feeding initiation in the critical care setting.

3.1. Inclusion criteria

1. Patients admitted to the Critical Care Unit (CCU).
2. Patients with feeding initiated within the first 24 hours post-admission.
3. Documentation specifying the type of feeding administered.

3.2. Exclusion criteria

1. Age
2. Sex
3. Detailed medical history
4. Presence of any comorbidities
5. Admission to departments other than the CCU

3.3. Feeding protocols

The study assessed feeding protocols, categorizing them as enteral or parenteral nutrition. Detailed information on the nutritional strategies for each patient was recorded.

3.4. Data collection

The patient data was obtained from Solace, the hospital databases. This encompassed a wide array of information, including demographic details and records of admission to the Critical Care Unit (CCU). Patient details were thoroughly verified during the ward rounds, ensuring accuracy in terms of the timing of feeding initiation and the specific type of feeding utilized.

3.5. Statistical analysis

Statistical analyses explored relationships between early feeding initiation, feeding types and relevant patient outcomes. Descriptive statistics and appropriate inferential analyses were conducted using MS Excel.

3.6. Ethical considerations

This study adhered to ethical guidelines, receiving approval from the Shree Krishna Hospital. Informed consent was obtained from eligible participants or their legal representatives. Patient confidentiality and privacy were rigorously maintained.

3.7. Limitations

A small sample size and time limits are two examples of anticipated limitations that should be taken into account when interpreting the results.

The purpose of this study was to provide important new information about how early feeding initiation affects patient outcomes in critical care. A strong basis for comprehending the importance of nutrition in the early phases of critical illness has been developed by means of a thorough analysis of the techniques and resources employed.

4. Results

The study encompassed a cohort of 200 patients, comprising 116 (58%) males and 84 (42%) females.

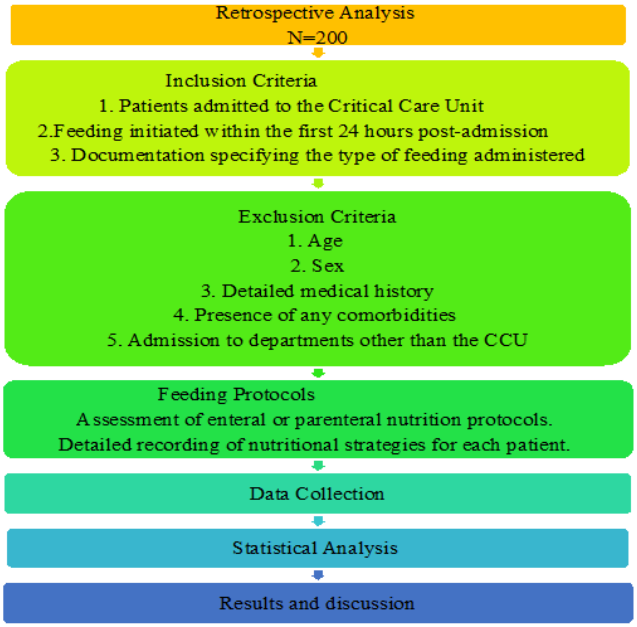

Figure 1: Flowchart of materials and methods

4.1. Medical history

The patients had varying medical backgrounds, with some having singular ailments such as Acute Febrile Encephalopathy, and progressed through various medical conditions including AKI, Alcoholic Hepatitis, Anemia, CKD, Acute Heart Failure (AHF), and Hypertension, diabetes with other complications, IHD, Chronic Pancreatitis, Skin Cancer, CLPD, COPD, AF, Depressive Disorder, and underwent interventions like CABG, PTCA, HIV, Hepatic Failure, GI Perforation, Epilepsy, Glaucoma, Hemorrhagic Stroke, Leukemia, respiratory (LRTI, COPD), cardiovascular (MI, MODS), renal (AKI on CKD), endocrine (Hypothyroidism), and musculoskeletal (RA, ILD). Hypertension was the most common condition, found in 17 cases. Some patients had singular conditions such as anemia, epilepsy, or glaucoma, while others had multiple conditions such as acute kidney injury with alcoholic hepatitis, chronic kidney disease, acute heart failure, and hypertension. Diabetes mellitus was also prevalent, with six patients experiencing various complications. The patients' medical histories provide valuable insights into the complex health challenges faced by this population, which can inform critical care and patient management.

4.2. Feeding initiation

Out of the 200 patients examined, 85 individuals (42.5%) began their feeding, while the remaining patients continued to be on Nothing by Mouth (NBM).

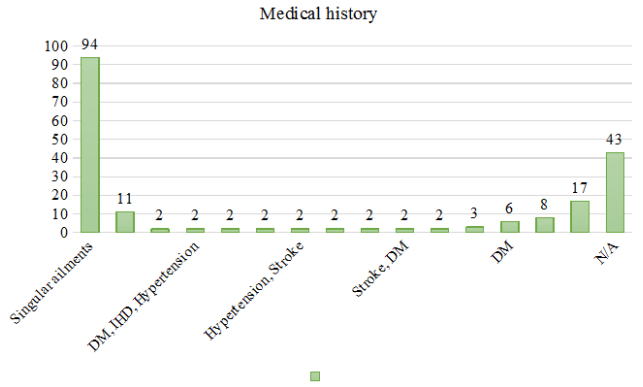

Figure 2: Medical history of patients

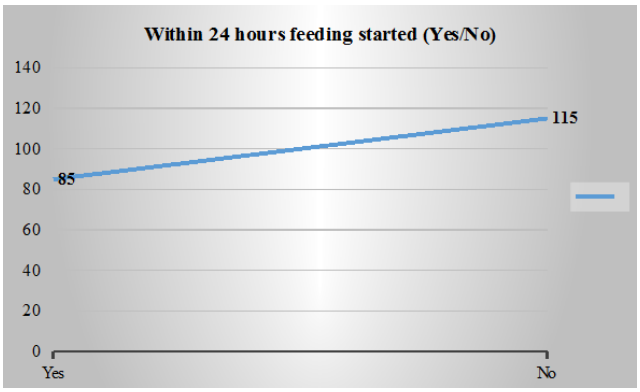

Figure 3: Within 24 hours feeding started (Yes/No)

4.3. Types of feeding

The study revealed a range of feeding methods, primarily centered on liquid diets. The study involved 115 patients who were placed on nothing by Mouth (NBM) as part of their prescribed feeding regimen. 4 patients received a liquid diet with full fluids, while 29 patients were given a liquid diet with clear fluids. Ready-to-Feed (RTF) was administered to 12 patients at a rate of 50 ml every 2 hours, and specific FD (feeding) types were given to five patients. Additionally, six patients were prescribed RTF at a rate of 100 ml every 2 hours, and FD Soft was the prescribed diet for 12 patients. One patient received RTF at a rate of 200 ml every 2 hours. These diverse feeding strategies highlight the individualized approach to nutritional support in the critical care setting, taking into account the varied needs and conditions of the patients under study.

Furthermore, tailored feeding strategies such as FD-CKD, FD-SRD, FD Soft DD, and various combinations were implemented based on the individual conditions of the patients. These findings emphasize the personalized and nuanced approach to nutritional support in the critical care setting.

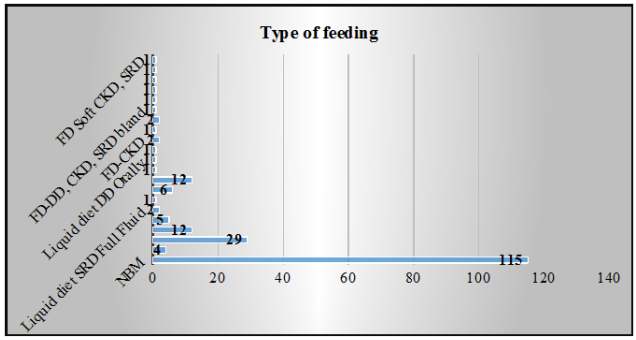

Figure 4: Types of feeding started within 24 hours

The results of this study provide valuable insights into the various medical backgrounds and feeding interventions used in the studied population, contributing to a deeper understanding of managing critically ill patients in the context of nutritional support. The research findings indicate that initiating nutrition or feeding early on resulted in significant benefits, as evidenced by the patient's significant improvement within the first 24 hours. This positive development prompted their transfer to the ward, resulting in a better quality of life compared to their peers. The early implementation of nutritional support had a significant impact on reducing complications, particularly infections, and improving wound healing. Early nutrition played a critical role in supporting neurological recovery, particularly in cases of traumatic brain injuries. Several studies cited in the research consistently demonstrated that early nutrition was associated with lower morbidity and mortality rates, resulting in better overall patient outcomes. This was particularly beneficial for mechanically ventilated patients as it supported optimal energy balance and facilitated robust recovery. The positive outcomes observed in patients' progress prompted their transfer to general wards, indicating improved conditions and a higher quality of life. In addition to immediate critical care, the research emphasized the fundamental role of early nutrition in promoting long-term well-being, highlighting its integral significance in comprehensive patient management.

5. Discussion

Patients in the intensive care unit (ICU) often confront an increased risk of malnutrition, compounded by the challenges of self-feeding. This research underscores the critical importance of early nutrition initiation within the initial 24 hours of admission to the Critical Care Unit (CCU). In the early phase of critical care, healthcare professionals grapple with the delicate balance of sustaining life while addressing severe illness. The study aligns with existing research advocating for early enteral feeding within the first 24-48 hours of ICU admission, linking it to improved outcomes in critically ill patients.[14]

The implementation of a feeding protocol in the CCU emerges as a focal point, with the study aimed at evaluating its impact on patient outcomes, assessing nutritional adequacy targets, and gauging the prevalence of early feeding initiation.[15] Early nutrition initiation proves crucial in maintaining organ function, supporting immune competence, and ensuring overall metabolic stability, thereby influencing morbidity, mortality, and long-term well-being. The observed associations with improved wound healing, neurological recovery, and reduced morbidity and mortality rates underscore the pivotal role of early nutrition in critical care.[16]

The diverse medical histories uncovered among the study's patients emphasize the intricate health challenges inherent in the critical care setting. Notable conditions such as hypertension, diabetes mellitus, and multi-organ complications underscore the necessity of tailoring nutritional support to address the specific health needs of critically ill patients.

Examining the initiation of early feeding reveals that 42.5% of patients commenced feeding within the crucial 24-hour timeframe, emphasizing the imperative nature of timely nutritional assistance. Understanding the spectrum of feeding methods employed, including NBM, liquid diets, and specific feeding regimens, provides insights into the nuanced and personalized approach adopted in the CCU. Diverse feeding protocols, such as FD-CKD, FD-SRD, and FD Soft DD, underscore the need for individualized strategies tailored to the unique conditions of each patient.

While the research aligns with established guidelines advocating for early enteral nutrition, it acknowledges limitations such as a small sample size and time constraints. These considerations are vital when interpreting the study's results. Optimized nutrition care of the ICU patients is important to maintain GI tract function, sustain immune defenses, prevent malnutrition and its worsening, and avoid severe loss of muscle mass and function.[17]

To summarize, this study enhances our understanding of the complex relationship between early initiation of feeding and the outcomes of patients in critical care. The differences observed in medical backgrounds and feeding interventions highlight the importance of an individualized and comprehensive approach to nutritional support. Subsequent research could explore the long-term effects of early nutrition initiation, thereby enhancing our knowledge of recovery paths and the overall well-being of patients.

6. Conclusion

In conclusion, this study illuminates the critical significance of early nutrition initiation within the initial 24 hours of admission to the Critical Care Unit (CCU). By evaluating nutrition adequacy targets, assessing the impact of a feeding protocol, and determining the prevalence of early feeding initiation, the research unveils the intricate medical histories of critically ill patients, with hypertension emerging as a predominant condition often accompanied by diverse comorbidities. The fact that 42.5% of patients received timely nutritional support within this crucial timeframe underscores its paramount importance.

To deepen our understanding of critical care nutrition, future studies could explore the prolonged impacts of early nutrition initiation on recovery paths and overall patient well-being. Emphasizing adherence to guidelines promoting early enteral nutrition and customized interventions ensures optimal care within the initial 24 hours, contributing to improved outcomes and patient-centered care.

The study reinforces the pivotal role of early nutrition initiation in the CCU, showcasing its profound impact on patient outcomes, reducing complications, and promoting wound healing. The personalized approach to feeding strategies, supported by diverse medical backgrounds, highlights the enduring benefits of early nutritional interventions, advocating for the imperative of timely nutritional strategies in comprehensive critical care management.

7. Source of Funding

None.

8. Conflict of Interest

None.

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