OPEN ACCESS

**Saudi Journal of Medical and Pharmaceutical Sciences**
Abbreviated Key Title: Saudi J Med Pharm Sci
ISSN 2413-4929 (Print) | ISSN 2413-4910 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

**Original Research Article** **Medicine**

# Pneumonia Infection Incidence with Enteral Feeding in Intensive Care Patients

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**DOI:** 10.36348/sjmps.2023.v09i10.006 | **Received:** 22.09.2023 | **Accepted:** 25.10.2023 | **Published:** 29.10.2023

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## Abstract

***Background*:** Enteral nutrition (EN) is the administration of a nutritionally complete feed through a tube into the stomach, duodenum, or jejunum. It has been proposed that EN helps to maintain the health and integrity of the gut barrier and is connected to increased levels of immunoglobulin synthesis, which may help to boost defenses against respiratory infections. However, critically ill patients may have a poor tolerance for enteral feeding and may develop unpleasant gastrointestinal effects such as nausea and vomiting. ***Aim*:** To investigate at the incidence between enteral nutrition and the risk of pneumonia in intensive care unit patients. ***Methods*:** This is an updated review of research that were published between 2016 and 2018. To research our topic, we employed the Google Scholar, Web of Science, and PubMed databases. The keywords used in various combinations included "enteral nutrition, feeding, incidence, aspiration, pneumonia, adults, ICU." In addition, original research on the relationship between entreat feeding and the risk of pneumonia in critically ill individuals was reviewed. The inclusion criterion was full-text publications. ***Results*:** Despite obtaining 17 papers, only three research met the inclusion requirements. All of the research were conducted in the past. The study included 413 adult patients in the intensive care unit. ***Conclusion*:** In critically ill people, enteral feeding was related with a lower risk of aspiration pneumonia and overall infections. Enteral feeding was found to be safe and effective for critically ill patients, with no major problems.

**Keywords:** Enteral nutrition, feeding, incidence, aspiration, pneumonia, adults, ICU.



## INTRODUCTION

Patients who are critically ill in intensive care units are particularly vulnerable to malnutrition because they may be unconscious, unable to feed themselves, receiving oral nutritional support, or both. Nutritional support is a difficult component of therapy for critically ill patients [1, 2].

Malnutrition is associated with greater mortality and morbidity rates, as well as susceptibility to non-infectious complications such as respiratory failure and cardiac arrhythmias, and sepsis [3]. Drug-related side effects might cause nausea, vomiting, or both, as well as appetite. Enteral nutrition (EN) is the administration of a nutritionally complete feed through a tube into the gastrointestinal track. It is appropriate for those who have a functional gastrointestinal tract but inadequate oral intake [4].

This strategy effectively gives nourishment to select patient groups with sepsis and acute pancreatitis. EN may contribute to the health and integrity of the intestinal barrier, as well as increased levels of immunoglobulin a synthesis, which may improve defenses against respiratory infections [5]. However, critically ill patients may have a poor tolerance for enteral feeding and may develop unpleasant effects such as nausea, vomiting, and non-occlusive bowel necrosis [6].

Nosocomial infections continue to be substantial causes of morbidity, mortality, and additional expenses. Ventilator-associated pneumonia (VAP) is a nosocomial infection that occurs in individuals who have

been on mechanical ventilation for at least 48 hours. VAP is a preventable occurrence that is the leading cause of death in the critical care unit [7]. VAP is expected to occur with a prevalence up to 27% in all intubated patients [8, 9]. It raises healthcare expenses by extending the duration of mechanical ventilation and intensive care unit (ICU) length of stay [10].

## METHOD AND SEARCH STARTAGY

Google Scholar, Web of Science, and PubMed were used to conduct a database search. The search included terms such as "enteral nutrition, feeding, incidence, aspiration, pneumonia, adults, ICU." After analyzing the association between enteral nutrition and the risk of pneumonia in critical-care people from 2016 - 2018, only publications in English and concentrating on the incidence of entreat feeding and the risk of pneumonia in critical-care adults were included. Three articles were included in this review. Other duplicates, non-full-text articles, and articles with unacceptable content, such as overlapped or incomplete data were excluded.

## RESULT

The inclusion criteria for this updated review were satisfied by three studies. All the studies were retrospective studies**.** The study population comprised 413 adult patients in the critical care unit.

Patel *et al*., in 2016 conducted a study looking for hospital mortality, length of intensive care unit stay (LOS), duration of mechanical ventilation (DOMV), and consequences of feeding intolerance in critically ill patients in ICU. A 66 patients were divided to different 3 groups, no EN (15 patients), less than 600 kcal/d EN (37 patients), and more than 600 kcal/d EN (14 patients). They found the LOS was significantly lower in patients receiving <600 kcal/d when compared to either no EN (P < .001) or those receiving ≥600 kcal/d (P < .001). Median DOMV was lower in patients receiving <600 kcal/d (median 3, P < .001) as compared to no EN (median 7, P < .001) or those receiving ≥600 kcal/d (median 7.5, P < .001). Mortality was not different. There were no significant complications among groups [11].

Another retrospective, observational study published in 2018 by Lee *et al.,* included all trauma patients over the age of 18 admitted to the ICU, all of whom required mechanical breathing for 7 days and were receiving EN. EN data were collected until patients were given an oral diet or released from the intensive care unit. The intervention group (n = 118) consumed considerably more calories (94% vs 75%, P< 0.001) and protein (104% vs 74%, P< 0.001) than the control group (n = 121). After intervention, the percentage of patients getting EN within 24 and 48 hours of ICU admission increased from 41% to 70% and from 79% to 96%, respectively (P< 0.001). Although the intervention group had fewer 28-day ventilator free days than the baseline group (12 vs 16 days, P = 0.03), receiving the intervention was associated with a significant reduction in pneumonia (OR, 0.53; 95% confidence interval, 0.31-0.89; P = 0.017) after adjusting for gender and Injury Severity Score [12].

Su *et al*., (2018) conducted a study that included all patients on mechanical ventilation who underwent EN treatment in the ICU. The patients were separated into two groups based on the initiation time of EN: early EN (54 patients) and late EN (54 patients) after 48 hours of mechanical breathing. Gastric juice pH, VAP incidence, mechanical breathing time, and ICU stay length were compared between the two groups. According to the findings of this investigation, the pH of gastric juice was lower in the early EN group than in the late EN group (4.8 vs. 5.6, P <0.01). In the early EN group, there were 8 patients with VAP, three of whom had early onset VAP. In the late EN group, there were 17 individuals with VAP, 10 of whom had early onset VAP. The incidence of VAP and the incidence of premature VAP were considerably lower in the early EN group than in the late EN group (14.8% vs. 31.5%, 5.6% vs. 18.5%, both P <0.05). Mechanical ventilation time (days: 7.5 vs. 8.6) and ICU stay (days: 10 vs. 11) were considerably shorter in the early EN group than in the late EN group (All P < 0.05) [13].

## DISCUSSION

Nutritional support therapy is a vital component of critical care. There are established guidelines for providing enteral nutrition (EN) with the goal of improving overall outcomes [1, 15]. In an intensive care unit (ICU), EN is advised as the first line of nutritional therapy. Recent research has found that early EN minimizes the likelihood of infectious complications when compared to delayed EN results [15]. Similarly, when compared to early parenteral nutrition (PN), early EN resulted in a lower rate of infection complications, length of ICU stay, and number of hospital days [16, 17]. The purpose of this review study was to look into the relationship between entreat feeding and the risk of pneumonia in critical-care adults.

The risk of VAP varies depending on where the EN tube is placed. A systematic review found that small intestine feeding reduces pneumonia (including VAP) in critically ill patients when compared to stomach feeding, without affecting mortality, ICU length of stay, mechanical ventilation duration, or the risk of GI bleeding. The mechanism by which small bowel feeding may reduce the occurrence of pneumonia remains unknown [18-20].

Although the installation of a feeding tube appears to be safe, in one research, a patient experienced cardiac arrest requiring cardiopulmonary resuscitation (CPR) while having an endoscopic jejunal tube inserted. Fortunately, this is a very rare occurrence that has not been observed in other trials. However, inserting small intestinal feeding tubes might be technically difficult.

Many trials definitely recorded feeding tube insertion failure, particularly with the blind insertion strategy. This emphasizes the necessity of health care provider training in order to boost success rates and avoid delays in beginning nutritional support. Backup procedures (e.g., fluoroscopic or endoscopic insertion) are thus vital, albeit not always available. On a practical level, if the feeding tube does not reach the small bowel, feeding into the stomach is an option [21].

## CONCLUSION

The present systematic review demonstrated that enteral nutrition was associated with a decreased risk for aspiration pneumonia and overall infections in critically ill patients. Enteral nutrition was found to be effective for critically ill patients, with no significant complications. In addition to protecting gastric mucosa, early enteral nutrition helps reduce the incidence of pneumonia, reduces the duration of mechanical ventilation, length of ICU stay, and improves the prognosis. These observations provide strong justification for the prospective evaluation of the effect of early enteral nutrition in critically-ill adults. Further studies are required to evaluate optimal nutritional approaches in critically-ill patients and patients who do not tolerate EN.

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