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Nasogastric tube versus postpyloric tube feeding for critical illness: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Not applicable.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202380104

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 August 2023 and was last updated on 24 August 2023.

INTRODUCTION

Review question / Objective Compare the efficacy and safety of gastric tube feeding with that of postpyloric tube feeding in critically ill patients.

Rationale Inconsistent results have been obtained for the two common forms of enteral nutrition in critically ill patients.

Condition being studied Enteral nutrition (EN) is considered the preferred means of nutritional support owing to its enhancement of gut immune function, lower cost, and lower risk of septic complications. The EN could be provided via various methods, and the two common forms are gastric tube feeding and small intestinal feeding. The use of gastric tube feeding showed that slow gastric emptying could increase the residual gastric volume; in addition, the risk of bacterial colonization and aspiration pneumonia increased in critically ill patients.

METHODS

Search strategy #1: (enteral nutrition OR duodenostomy OR gastrostomy OR jejunostomy OR intubation, gastrointestinal): [MeSH] OR #2: (duodenostom* OR gastrostom* OR PEJ OR PEG OR jejunostom* OR jtube* OR g-tube* OR ng-tube* OR nj-tube*):[ab,ti,kw] OR ((nutrition* OR feed* OR fed OR tube* OR intub*) #3: #1 OR #2 #4: (nasogastr* OR duoden* OR gastr* OR nasoduoden* OR jejun* OR nasojejun* OR postpylor* OR bowel* OR trans-pylor* OR intestine* OR gavage OR orogastric OR stomach OR nasoenter*):[ab, ti, kw]). #5: #3 AND #4 #6: (intensive care OR critical care OR critical illness OR pneumonia OR burn OR respiratory failure OR craniocerebral trauma OR burns OR pancreatitis) #7: (intensive care OR ICU OR critical* ill* OR critical patients OR critical* care OR pneumonia OR burn OR pancreatitis OR trauma OR injur*):[ab, ti, kw].

#8: #6 AND #7
#9: #5 AND #8.

Participant or population All patients with critical illness and admitted to the ICU.

Intervention Received gastric tube feeding.

Comparator Postpyloric tube feeding.

Study designs to be included The study had to have RCT design.

Eligibility criteria Studies that met the following inclusion criteria were included: (1) Patients: all patients with critical illness and admitted to the ICU; (2) Intervention: received gastric tube feeding; (3) Control: postpyloric tube feeding; (4) Outcomes: the primary endpoints were mortality and pneumonia, while the secondary endpoints included abdominal distension, diarrhea, vomiting, bacteremia, constipation, gastrointestinal bleeding, high gastric residual volume, pulmonary aspiration, percentage of total nutrition delivered to the participant, time required to achieve the full nutritional target, time required to start feeding, length of ICU stay, length of hospital stay, and length of mechanical ventilation; and (5) Study design: the study had to have RCT design.

Information sources PubMed, Embase, and Cochrane Library databases.

Main outcome(s) Mortality and pneumonia.

Additional outcome(s) Abdominal distension, diarrhea, vomiting, bacteremia, constipation, gastrointestinal bleeding, high gastric residual volume, pulmonary aspiration, percentage of total nutrition delivered to the participant, time required to achieve the full nutritional target, time required to start feeding, length of ICU stay, length of hospital stay, and length of mechanical ventilation.

Quality assessment / Risk of bias analysis The two reviewers independently assessed the methodological quality of the included trials using the risk of bias described by the Cochrane Collaboration, which was based on random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias.

Strategy of data synthesis The investigated outcomes were divided into categorical and continuous outcomes, and the relative risk (RR) or weighted mean difference (WMD) with 95%

confidence intervals (CI) was calculated in individual trials before data pooling. All pooled analyses were performed using a random-effects model, which considered the underlying variations across the included trials.

Subgroup analysis Subgroup analyses for mortality and pneumonia were performed according to country, age, proportion of male participants, and postpyloric tube, and differences between subgroups were assessed using the interaction t-test.

Sensitivity analysis The robustness of the pooled conclusions for mortality and pneumonia was assessed using sensitivity analysis through the sequential removal of a single trial.

Language restriction The publication language was restricted to English.

Country(ies) involved China.

Keywords Nasogastric tube; postpyloric tube; critical illness; systematic review; meta-analysis.

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