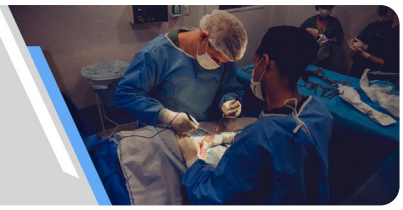
fortune Journals

Research Article

ANESTHESIA AND CRITICAL CARE

ISSN: 2687-7996



Nasogastric and Nasojejunal Feeding in Critically Ill Patient in Intensive Care Unit - A Randomised Comparative Study

Aziz Ahmed[1*], Sanjeev Kumar[2], Akhil Piyush[3]

Abstract

Nutrition plays a crucial role in the recovery of critically ill patients. Enteral route allows proper absorption of the required nutrients. However, feeding via mouth is not possible in all patients of ICU so nasogastric and nasojejunal mode of nutrition is used. In this study we have compared the efficiency of both the mode of nutrition. In all 60 patients participated in this study they were equally divided into two groups. The first group received feeding via nasogastric method and the other group received feeding via nasojejunal method. They were supervised during the feeding session throughout their stay at Intensive Care Unit. Duration of stay and any complications throughout were documented. The following observations were made uration of ICU stay in NG group was 15.80±5.76days were as Duration of ICU stay in NJ group was 9.50±8.69days, with P-value of 0.348. Mean duration of mechanical ventilation in NG group were 12.23±5.55 days where as Mean duration in NJ groups was 6.00±6.72days with P value of 0.316. In terms of duration of stay at hospital and the occurrence of complication both nasogastric and nasojejunal mode feeding had similar results. Further studies needed to validate these results and to apply on whole population.

Keywords: Nasojejunal; Nasogastric; Feeding; ICU; Critically-ill patient.

List of Abbreviation

NJ: Nasojejunal

NG: Nasogastric

ICU: Intensive Care Unit

BMI: Body Mass Index

Introduction

Nutrition of the critically ill patients admitted to Intensive Care Unit plays an important role considering the healing process, and recovery from illness [1]. However, mode of nutrition is debatable concept in such patients, due to surgery and other complication parenteral mode of nutrition should be preferred but as per the evidence from the literature enteral mode of nutrition has manifold benefits [2]. Reduced gastric motility due to the use of opioids as analgesics, shock therapy and other surgical intervention can lead to infection [3]. The reduced gastric absorption can cause colonization of the bacteria leading to pneumonia. Feeding with nasojejunal tube is preferential over the nasogastric tube feeding considering the risk of nosocomial infection. As the jejunum can absorb the nutrition easily the food does not remain in the intestine for longer period of time which reduces the risk of infection and it

Affiliation:

[1]Department of Anaesthesiology and CCM, Government Medical College, Purnea, Bihar, India

[2]Department of Anaesthesiology and CCM, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India

[3]Department of Anaesthesiology and CCM, Patna Medical College & Hospital, Patna, Bihar, India

***Corresponding author:**
Aziz Ahmed, Department of Anaesthesiology and CCM, Government Medical College, Purnea, Bihar, India

Citation: Aziz Ahmed, Sanjeev Kumar, Akhil Piyush. Nasogastric and Nasojejunal Feeding in Critically Ill Patient in Intensive Care Unit - A Randomised Comparative Study. Anesthesia and Critical care 6 (2024): 26-30.

Received: March 19, 2024
Accepted: March 29, 2024
Published: April 12, 2024

Aziz Ahmed, et al., Anesth Crit Care 2024
DOI:10.26502/acc.068

does not depend on the gastric emptying time. Nevertheless, the literature demonstrated that the feeding by nasogastric tube and nasojejunal tube has comparable outcomes [4,5]. Since nutrition substantially helps not only in the recovery of the patient but prevents malnutrition, other complications, and the risk of infection, choosing the appropriate mode of nutrition improves the clinical outcome and decreases the stay in the ICU. The studies conducted on the nutrition provided to the patients in ICU shows that most of the times patients are underfed and such patients do not have optimum response to the treatment given [6,7]. Along with the proportion of essential calories, proteins, carbohydrates, fats, minerals, and vitamins it is necessary to determine the mode of nutrition to prevent the occurenc eof complications. This study is conducted to compare the nasojejunal and nasogastric mode of feeding critically-ill patients admitted in the Intensive Care Unit. The efficiency of the mode of nutrition is determined in terms of duration of stay at hospital, occurrence of nosocomial infection, and duration of the mechanical ventilation required.

Methods

Study design

This is a comparative randomized study conducted at Indira Gandhi Institute of Medical Sciences, Patna.

Participants

In all 60 patients participated in this study they were equally divided into two groups. The first group received feeding via nasogastric method and the other group received feeding via nasojejunal. The patients who were admitted for more than 48 hours to the Intensive Care Unit and required enteral feeding were included in this study. The patients who had complications such as malignancy, surgical procedures in the stomach and jejunum, gestation, and or any gastrointestinal conditions were not included in the study.

Study protocol

The study was randomized double blinded. After the stabilization of patients and recording their APACHEII score, BMI, age and other preliminary information, the patients were divided into two the first group was given feeding with nasogastric tube and the other group was given feeding with nasojejunal tube. The group in which nasogastric mode was used , nasogastric tube was placed by using local anesthetics. The placing of tube was confirmed by insufflation of air. Nasojejunal tube was placed using endoscopy in the nasojejunal group. The placing of the tube was confirmed using radiographic techniques. Incase the nasojejunal tube did not reach jejunum then prokinetics were given. As per the nutritional requirement of each patient, nutritionist curated the formula which was injected using 50 ml syringe. Patients were kept at 30 to 45 degree while feeding. They were supervised during the feeding session throughout their stay at Intensive Care Unit. Any complication such as pneumonia, emesis, VAP, and duration for which mechanical ventilation was given were noted.

Ethical consideration

The institutional ethics committee gave the approval for this study.

Statistical analysis

The data obtained from both the groups was arrange in a tabular format. Average and standard deviation were calculated, the data obtained from both the groups were compared using students paired t test. The efficiency of both the feeding modes were determined statistically.

Result

It was observed that maximum no of patients in NG groups were of 50-60 year age group (50%) and that in NJ groups were of 40-49 year age group (36.67%). The age of patients in NG group ranged from 20-60 years with Mean age of 46.80±10.03year, while that of NJ groups the Mean age was 42.00±10.57year, however this difference was statistically insignificant as the p- value was 0.168. There were 14 (46.67%%) male and 16 (55.33%) female in NG group whereas 15 (50%) male and 15 (50%) female in NJ group. Distribution of sex between the two groups found to be not significant. Most of the patients were of normal BMI in both the groups. 19 patients (63.33%) in NG group and 20 patients (66.67%) in NJ group having normal BMI. Mean BMI in NG & NJ groups were 23.56±4.29 & 23.20±4.21respectively. This comparison of BMI in between the two groups were statistically insignificant as the p-value was 0.760. As indicated in table no.1 there was no significant difference in APACHE score of the patients of both the group.

Table 1: APACHE distribution of subjects

APACHE	NG		NJ		P value
	No. of patients	Percentage	No. of patients	Percentage	
03-Oct	0	0%	0	0%	0.856
Nov-20	0	0%	0	0%	
21-30	26	86.67%	27	90%	
31-40	4	13.33%	3	10%	
>40	0	0%	0	0%	
Mean ±SD	25.76±3.41		25.93±3.40		

It has shown from the distribution of Glassgow coma Scale in NG Mean ±SD is 9.00±3.40 whereas Mean ±SD of NJ is 8.36±3.16. The P value is 0.475 and hence it is not significant (Table no.2)

Aziz Ahmed, et al., Anesth Crit Care 2024
DOI:10.26502/acc.068

Table 2: Glasgow coma Scale (GCS) distribution of subjects

GCS	NG	NJ	't' value	P. Value
Mean±SD	9.00±3.40	8.36±3.16	0.724	0.475

16 patient (53.33%) was of medical type and 14 patients (46.67%) was of Surgical type in NG group whereas 14 patients (46.67%) was of medical type and 16 patient (53.33%) was of surgical type in NJ group. There is no statistically significant difference between NG and NJ (Table no.3)

Table 3: Patient type distribution of subjects

Patient type	NG		NJ	
	No. of patients	Percentage	No. of patients	Percentage
Medical	16	53.33%	14	46.67%
Surgical	14	46.67%	16	53.33%

Duration of ICU stay in NG group was 15.80±5.76days were as Duration of ICU stay in NJ group was 9.50±8.69days, with P value of 0.348 and hence it was not statistically significant (Table no. 4)

Table 4: Length of ICU stay of patients

Length of ICU stay	NG	NJ	't' value	P. Value
Mean±SD	15.80±5.76	9.50±8.69	3.066	0.348

Mean duration of mechanical ventilation in NG group were 12.23±5.55 days where as Mean duration in NJ groups was 6.00±6.72days with P value of 0.316 and hence it was not significant (Table no. 5).

Table 5: Duration of mechanical ventilation

Duration of mechanical ventilation	NG	NJ	't' value	P. Value
Mean±SD	12.23±5.55	6.00±6.72	3.596	0.316

Complications were not statistically significant when compared between two groups. No of patients with vomiting were 6 in NG groups as compared to 5 in NJ groups. No of patients with aspiration pneumonitis were 4 in NG group as compared to 3 in NJ group. No of patients who developed VAP were 10 in NG groups as compared to 9 (Table no. 6). Hence no statistically significant difference found with respect to feeding with either of the two methods and their related complications

Table 6: Complication in patients

Complication	NG		NJ	
	No. of patients	Percentage	No. of patients	Percentage
Vomiting	6	20%	5	16.67%
Aspiration Pneumonitis	4	13.33%	3	10%
VAP	10	33.33%	9	30%

16 out of 30 patients in NG groups were downgraded to HDU whereas 19 out of 30 patients in NJ groups were downgraded to HDU. 14 out of 30 patients in NG groups died and 11 out of 30 patients in NJ groups died. Hence no significant statistical difference in outcome of patients were seen when NG groups was compared with NJ groups (Table no. 7)

Table 7: Outcome of patients

	NG		NJ	
	No. of patients	Percentage	No. of patients	Percentage
Downgraded to H.D.U	16	53.33%	19	63.33%
Death	14	46.67%	11	36.67%

Discussion

This randomized comparative study at I.G.I.M.S Patna compared early nasogastric and early nasojejunal feeding in patients admitted at ICU and compared the duration of mechanical ventilation and length of ICU stay along with the complications between the two groups. There were 14 (46.67%) male and 16 (55.33%) female in NG group, whereas 15 (50%) male and 15 (50.7%) female in NJ group in our study. [8]. In a study they found that no. of male in NG group were (64.58%) while no. of male in NJ group were (73.85%) where as no. of females in NG group were (35.42%) and that in NJ groups were (26.15%) with a p value of 0.393 and hence statistically not significant as seen in our study [9]. In another study the total no. of males in NG group were (43%) and that in NJ group were (56%) whereas total no. of female in NG groups were (35%) and that in NJ group were (24%) and no statistically significant difference was seen [10]. Researchers found in their study that total no. of male in NG group were (90%) while total no. of male in NJ group were (83.3%) whereas total no. of female in NG group were (10%) and total no. of female in NJ group were (16.7%) with a p value of 0.447 and hence statistically not significant similar to our study [11]. Yet another study showed that male to female ratio in NG group was 14: 13 whereas M : F ratio in NJ group was 12 : 10 with a slight male preponderance but statistically not significant [12]. There is no statistically significant difference found between NG and NJ group with respect to age distribution. The mean age group of our study subjects was 46.80 years in nasogastric group and 42.00 years in nasojejunal group. Distribution of obesity in two group shows that obese population constitutes 10% in NG group where as it is 13.33% in NJ group. Mean BMI of NG group is 23.56±4.29 whereas Mean BMI of NJ group is 23.20±4.21. The P value is 0.760 and hence it is not statistically significant. In the study Mean BMI of NG group was 23.62 kg/m and the Mean BMI of NJ group was 22.77kg/m^2 with a P value of 0.238 hence insignificant statistically as in our study [13]. In

our study no. of patient of medical type were 53.33% and that of surgical type were 46.67% in NG group while in NJ

Group of population 46.67% were medical type and 53.33% were of surgical type and was statistically insignificant. In our study the Mean APACHE || score of the NG group of the population was 25.7 where as in the NJ group the Mean APACHE || score was 25.93 with a P value of .856 hence not statistically significant. In a similar study Mean APACHE || score was compared with a P value of 0.257 [5]. Similarly, in another study APACHE || score was 22 in NG group and 22 in NJ group [7] In our study we found that duration of ICU stay in NG group was 15.80±5.76 days and duration of ICU stay in NJ group was 9.5 ± 8.69 days with p value of 0.348 and hence statistically insignificant, so it was seen that not significant reduction in length of stay (LOS) in ICU was seen in NJ group when compared to NG group. In a study that the duration of ICU stay in NG group was 12 days where as in NJ groups were 10 days with P value of 0.444 hence statistically insignificant as in our study [14]. A study demonstrated that length of hospital stay in NG group was 14.8±3.68 where as in NJ group was 9.4±4.32 with P value of 0.05 and hence statistically significant irrespective of our study that is reduction in LOS in ICU was seen in NJ group of population when compared with NG group of population [15]. Another study showed that when compared the NG group of population with NJ group of population in terms of ICU length of stay (LOS) it was found to be 7 days in NG group and 8 days in NJ group [16]. In our study we did not found any statistical difference in duration of mechanical ventilation with mean being 12.25 in NG group and 6.00 in NJ group with P value being 0.36. A similar study found no statistical difference in duration of mechanical ventilation (MV) with mean duration being 7 days in NG group and 4 days in NJ group with P value being 0.444 hence not statistically significant that is no change in the outcome of patient was seen between the two groups [18]. In our study the duration of ICU stay in NG group of acute pancreatitis was 16 where as it was 17.66 with a P value of 0.753 and so not significant. Similarly, Mean duration of mechanical ventilation in NG group was 11.33 days while in NJ group was 10.33 days with a P value of.808 and hence insignificant. Both the group tolerated feeding well except for some side effects which were evident after 48 hours of initiating feeding. The incidence of vomiting was 6 (20%) and 5(16.67%) in the nasogastric and nasojejunal groups respectively (P 0.027). The incidence of aspiration pneumonitis was 13.33% in NG group and 10% in NJ group while incidence of VAP was 33.33% in NG group and 30%in NJ group. There was no difference of post-feeding nausea and vomiting in NJ compared to NG. In a similar study the incidence of vomiting was found 18% in NG group and 14% in NJ group with a P value of 0.826 and hence not significant [8]. Similarly, the incidence of Pneumonia was 12% in NG group and 13% in NJ group with a P value of 0.730 and hence not significant statistically. ICU mortality was 46.67% in NG group and 36.67% in NJ group in our study. A similar study found the mortality 22% in NG group and 20% in NJ group slightly less mortality was seen in NJ group in both the study but statistically was not significant [9].

Conclusion

In terms of duration of stay at hospital and the occurrence of complication both nasogastric and nasojejunal mode feeding had similar results. However, numerically the incidences of side effects were higher for nasojejunal mode of feeding.

Limitation

Results of this study may vary when it is conducted on large scale. It cannot be generalized on whole population as it is a single centre study.

Recommendation

Further studies needed to validate these results and to apply on whole population.

Acknowledgments

We are grateful to the hospital's staff and patients involved in the study for their cooperation during the study.

Source of funding: None

Conflict of interest: None

References

1. Lipman TO. Grains or veins: Is enteral nutrition really better than parenteral nutrition? A look at the evidence. JPEN J Parenter Enteral Nutr 22 (1998): 167–182.
2. Cerra FB, Benitez MR, Blackburn GL, et al. Applied nutrition in ICU patients: A consensus statement of the American College of Chest Physicians. Chest 111 (1997): 769–778.
3. Jolliet P, Pichard C, Biolo G, et al. Enteral nutrition in intensive care patients: A practical approach. Intensive Care Med 24 (1998): 848–859.
4. Heyland D, Cook DJ, Winder B, et al: Enteral nutrition in the critically ill patient: A prospective survey. Crit Care Med 23 (1995): 1055–1060.
5. Hill SA, Nielsen MS, Lennard-Jones JE: Nutritional support in intensive care units in England and Wales: A survey. Eur J Clin Nutr 49 (1995): 371–378.
6. Planas M. Artificial nutrition support in intensive care units in Spain. Intensive Care Med 21 (1995): 842–846.
7. Dive A, Moulart M, Jonard P, et al. Gastroduodenal

Aziz Ahmed, et al., Anesth Crit Care 2024
DOI:10.26502/acc.068

motility in mechanically ventilated critically ill patients: A manometric study. Crit Care Med 22 (1994): 441–447.

8. Heyland DK, Tougas G, King D, et al. Impaired gastric emptying in mechanically ventilated, critically ill patients. Intensive Care Med 22 (1996): 1339–1344.

9. Bosscha K, Nieuwenhuijs VB, Vos A, et al. Gastrointestinal motility and gastric tube feeding in mechanically ventilated patients. Crit Care Med 26 (1998): 1510–1517.

10. Adam S, Batson S. A study of problems associated with the delivery of enteral feed in critically ill patients in five ICUs in the UK. Intensive Care Med 23 (1997): 261–266.

11. Keller RT. A technique of intestinal intubation with the fiberoptic endoscope. Gut 14 (1973): 143–144.

12. Stark SP, Sharpe JN, Larson GM. Endoscopically placed nasoenteral feeding tubes: indications and techniques. Am Surg 57 (1991): 203–205.

13. Patrick PG, Marulendra S, Kirby DF, et al. Endoscopic nasogastric-jejunal feeding tube placement in critically ill patients. Gastrointest Endosc 45 (1997): 72–76.

14. Reed RL, Eachempati SR, Russell MK, et al. Endoscopic placement of jejunal feeding catheters in critically ill patients by a "push" technique. J Trauma 45 (1998): 388–393.

15. Pingleton SK, Fagon JY, Leeper KV. Patient selection for clinical investigation of ventilator-associated pneumonia: Criteria for evaluating diagnostic techniques. Chest 102 (1992): 553S-556S.

16. Bone RC, Balk RA, Cerra FB, et al. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Chest 101 (1992):1644–1655.

17. Kollef MH, Von Harz B, Prentice D, et al. Patient transport from intensive care increases the risk of developing ventilatorassociated pneumonia. Chest 112 (1991): 765–773.

18. Montecalvo MA, Steger KA, Farber HW, et al. Nutritional outcome and pneumonia in critical care patients randomized to gastric versus jejunal tube feedings. Crit Care Med 20 (1992): 1377–1387.