Post-Operative Resumption of Clear Liquids Orally at 2 Hours And 6 Hours, In Patients Undergoing Elective Surgeries Under General Anesthesia: A Comparative Study

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ABSTRACT

Introduction: Early oral nutrition initiation is an essential component of multimodal perioperative care. It is associated with early intestinal function recovery, better immunity, improved wound healing, early ambulation, and decreased morbidity. However, a gap exists between postoperative feeding evidence and its practical application. **Aims:** To compare patient's satisfaction regarding thirst and the occurrence of post-operative nausea, vomiting, and aspiration of gastric contents after resumption of clear liquid orally at 2 hours and 6 hours postoperatively**. Methods:** Ninety-six patients, aged 18 to 70 years, of either sex and ASA I to II, who underwent elective surgeries under general anesthesia, were randomly divided into two equal groups: group 1 and group 2. Patients in group 1 were given clear liquid orally at 2 hours, and group 2 at 6 hours postoperatively. Patient satisfaction regarding thirst, occurrence of postoperative nausea, vomiting, aspiration of gastric contents, and flatus time were compared between the two groups. SPSS 20 was used for data analysis. Student T-test, Chi-square test, Fisher's test, and Man-Whitney test were applied. **Results:** Gender distribution and mean age in both groups had no statistical difference, with P values of 0.358 and 0.331, respectively. The thirst distress scale and post-operative flatus time were significantly lower, whereas Likert's satisfaction level regarding thirst was higher in group 1 compared to group 2, with P-values of 0.00, 0.038, and 0.001, respectively. APFEL grading and postoperative nausea and vomiting grading were statistically similar, with p-values of 0.26 and 0.116, respectively. No aspiration occurred in both groups. **Conclusion:** Compared to 6 hours, resumption of clear liquid 2 hours postoperatively after general anesthesia decreases thirst distress and post-operative flatus time, with the additional benefit of increasing patient satisfaction levels, without any difference in post-operative aspiration rate.

***Keywords**:* Aspiration, clear fluid, double blinded study, postoperative resumption, two and six hours

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INTRODUCTION

Early release of thirst has both physiological and psychological benefits, along with better patient satisfaction, without added complications, even in surgeries like gastrointestinal, obstetrics and laryngeal surgeries done under general anesthesia.[1] The European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines recommend that oral intake can be initiated within the first hour of surgery in most patients.[2] Despite clear evidence and guidelines, many anesthesiologists still fear that early initiation of clear liquids after general anesthesia may lead to post-operative nausea and vomiting (PONV) and clinically significant pulmonary aspiration of gastric contents.[3,4] Hence, they force their patients to iatrogenic thirst.[1,5] This deep-rooted fear among anesthesiologists may be because there are still not many studies that compare the early initiation of clear liquids with the regularly practiced 6-hour protocol. Hence, we have chosen this study to compare the resumption of clear liquid at 2 hours with 6 hours postoperatively after general anesthesia. We compared PONV, pulmonary aspiration of gastric contents, patients' satisfaction regarding quenching of thirst, extent of thirst and flatus time between the two groups.

METHODS

This comparative study is a prospective, double-blinded study

conducted from November 2024 to April 2025 at Nepalgunj Medical College Teaching Hospital in 96 patients, following IRC approval.

Sample Size:

Computation of Cohen's d (standardized mean difference) was done with a formula[6], d = μ1−μ2/sp

Where, d= Cohen's d, μ1 = mean in group 1, μ2 = mean in group 2 and sp = pooled standard deviation. Taking the reference of Yin X et al[7], d = 46.27−61.09/ 20.07 = 0.74.

This was followed by calculating conversion of Cohen's d into Mann- Whitney effect size (Area under the curve) with the formula AUC = Φ (d/√ 2) = 0.70, where Φ is the standard normal cumulative distribution function[6]

After taking 95% confidence interval and 99% power, finally, the sample size calculation for Mann-Whitney U test was done with the formula[6]

$n=(Z1-\alpha/2+Z1-\beta)^2 / 6 \times(AUC-0.5)^2$

where, $Z1-\alpha/2 = 1.96$, $Z1-\beta = 2.33$, AUC = 0.70 (from the above calculation)

With a 15% drop-out rate, the final total sample size calculated was 92, i.e., 46 for each group. However, due to availability of cases that could be logistically managed and would be more beneficial with respect to increased power and better precision, it was decided to study a total of 96 subjects, i.e., 48 for each group.

Patients of the 18-70 years age group, with ASA I-II, who underwent elective surgeries under general anesthesia were included in the study. Patients with severe obesity, gastroesophageal reflux disease, diabetes, and a history of alcohol and drug abuse, along with patients with surgeries for intestinal obstruction, craniotomies, and lower segment cesarean section (LSCS), were excluded.

After obtaining written consent, all the patients included in the study went through routine pre-anesthetic checkups and routine premedication. On arrival at the operation room, their vitals were monitored, and general anesthesia was given. In the operation room, single or combination of antiemetics like ondansetron, promethazine hydrochloride, and dexamethasone were administered, according to the APFEL simplified risk score.[8] Once the surgery was over, the patients were shifted to the post-operative ward. In the post-operative ward, patients were divided into two groups randomly: group 1 and group 2, with a 1:1 ratio, after concealment with a sequential numbered opaque sealed envelope technique.

Patients in group 1 were given water to drink after 2 hours of operation and in group 2 after 6 hours. Patients' body positions while drinking were kept supine, with their heads elevated at 30°. The degree of thirst distress (Table I), PONV (Table III), postoperative pulmonary aspiration, and patients' satisfaction regarding quenching thirst (Table II) were recorded. Postoperative pulmonary aspiration was graded as 0- None, 1- cough, 2-pneumonitis, 3-pulmonary edema, 4-ARDS. Time for the first passage of flatus and the presence or the absence of abdominal bloating was also recorded. The record-keeping was done by anesthesiologists unaware of the group the patients belonged to.

Statistical analysis

Data were analyzed with SPSS 20. The T-test was applied to compare continuous data, the Mann-Whitney test for ordinal data, and either the Chi-square test or the Fisher's exact test

	Not Uncomfortable	A little Uncomfortable	Very Uncomfortable
Dry Mouth	0	1	2
Dry Lips	0	1	2
Thick Tongue	0	1	2
Thick Saliva	0	1	2
Dry Throat	0	1	2
Bad taste	0	1	2
Want to drink	0	1	2
Final Score			

Table I: Peri-operative thirst distress scale[9]

Grade	Level of satisfaction
1	Extremely Not Satisfied
2	Not Satisfied
3	Moderately Satisfied
4	Very Satisfied
5	Extremely satisfied

Table II: Five-point Likert's scale[10]

Grade	Quantification of PONV
1	No PONV
2	Nausea only
3	Vomiting< 3 times a day
4	Vomiting > 3times a day

Table III: Quantification of PONV[11]

The presence or absence of post-operative aspiration was recorded.

RESULTS

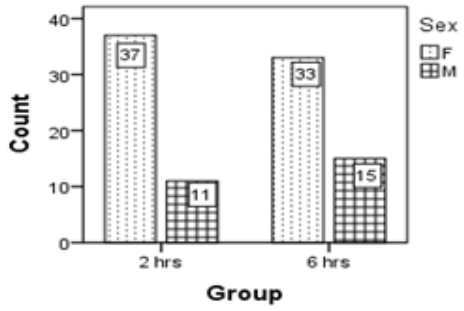

Figure 1: Gender Distribution among the groups

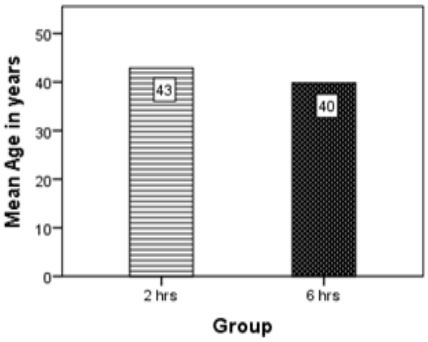

Figure 2: Mean Age between the groups

Both study groups had the majority of female patients, and the gender distribution in both groups was similar, with a P value of 0.358 when the Chi-square test was applied (Figure 1).

The mean age in group 1 and group 2 were 43 years and 40 years respectively (Figure 2). When a student T-test was applied, there was no statistical difference in the mean age between the two groups. The p-value was 0.331.

Types of Surgeries					
Group 1 (2 hrs)			Group 2 (6 hrs)		
Surgeries	Frequency	Percentage	Surgeries	Frequency	Percentage
Discectomy	3	6.3%	Excision of lipoma	1	2.1%
Excision of Goiter	1	2.1%	Excision of LN	1	2.1%
Lap Chole	33	68.8%	Lap Chole	37	77.1%
Hysteroscopy	1	2.1%	RT URSL	1	2.1%
FESS	2	4.2%	Rt PCNL	1	2.1%
ORIF	2	4.2%	ORIF	6	12.5%
Polypectomy	1	2.1%	Polypectomy	1	2.1%
Pyeloplasty	1	2.1%			
Septoplasty	2	4.2%			
Sistrunk Operation	1	2.1%	Total	48	100.0%
Tonsillectomy	1	2.1%			
Total	48	100.0%			

Table IV: Types of Surgeries

Laparoscopic Cholecystectomy was the most common surgery with 69% and 77% in group 1 and group 2 respectively (Table IV).

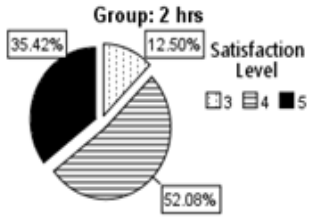

Figure 3: Likert's Level of satisfaction group 1

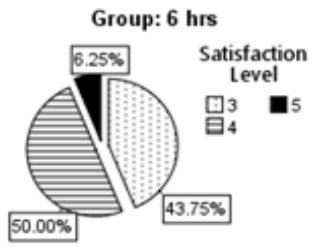

Figure 4: Likert's Level of satisfaction group 2

Approximately half of the patients in both groups had level 4 satisfaction, but level 5 satisfaction (Figure 3 and 4) and overall satisfaction level were statistically higher (Table V) in group 1 than in group 2.

	Group	N	Mean Rank	Sum of Ranks	P Value
Apfel Simplified Risk Score	1	48	51.63	2478.00	0.246
	2	48	45.38	2178.00	
Grade of PONV	1	48	45.33	2176.00	0.116
	2	48	51.67	2480.00	
Thirst distress scale	1	48	34.70	1665.50	0.001
	2	48	62.30	2990.50	
Satisfaction Level	1	48	59.47	2854.50	0.001
	2	48	37.53	1801.50	
Post op Aspiration	1	48	48.50	2328.00	1.000
	2	48	48.50	2328.00	

Table V: Comparison of Apfel score, Grade of PONV, thirst distress scale, Likert's satisfaction level, and post-op aspiration between the two groups (Man Whitney Test)

The thirst distress scale was significantly lower in group 1, compared to group 2, whereas Apfel score and PONV were statistically similar (Table V). None of the patients in both groups had post-operative aspiration of gastric contents.

	Group	N	Mean	Std. Deviation	Levene's test for Equity Sig.	Sig. (2 tailed)
Flatus Time in hours	1	48	15.44	5.831	0.701	0.038
	2	48	18.35	7.648		

Table VI: Comparison of first post-operative flatus time between the groups (Independent T-test)

Post-operative flatus time was significantly reduced in group 1 (Table VI).

2 cases in group 2 had abdominal bloating, and none in group 1. When compared using Fisher's exact test, the p-value was 0.495.

DISCUSSION

Delaying postoperative feeding gives no added advantages.[2] Prolonged thirst can lead to negative emotions such as anxiety, irritability, and postoperative delirium, as well as various metabolic, neurohumoral, and immunological complications.[12] Aspiration of gastric contents, the most feared post-operative complication related to feeding and general anesthesia, occurs due to the relaxation of the cardiac sphincter and the suppression of the gag reflex as a physiological effect of general anesthesia. However, newer studies suggest that early, but multiple small amounts of gradual fluid consumption lead to early physiological adaptation and recovery of gastrointestinal and laryngeal function after general anesthesia, without increasing the incidence of postoperative complications.[12] Various observational studies, meta-analyses, and multicentric trials support early oral intake after surgery.[2] Even "ultra-early" postoperative feeding has been practiced in some hospitals since 2015, where the patients are allowed to drink clear liquid immediately after stabilization in the post-anesthesia recovery room.[13]

In our study, the demographic profile regarding gender distribution and the mean age between the two groups was statistically similar, with p-values of 0.358 and 0.331, respectively. Laparoscopic cholecystectomy was the most common surgery in both groups, 69% and 77% in group 1 and group 2, respectively. The difference in the Apfel score between the two groups was also statistically insignificant with a P value of 0.26.

In our study, the Man Whitney test showed a significantly lower thirst distress scale in patients receiving oral clear liquid in group 1 than in group 2 with a p-value of 0.001. Sun Zj, Sun X, Huo Y, et al conducted a study on 306 patients receiving both general and regional anesthesia, among which 286 (93.5%) patients regained oral fluids within 2 h after surgery, where the thirst scale was significantly reduced in patients regaining oral fluids within 2 hours.[14]

In our study, when the patients' satisfaction level regarding thirst was compared, group 1 had a significantly higher level of satisfaction than group 2, with a p-value of 0.001. Similarly, in the study by Yin X, Ye L, Zhao L, Li L, and Song J on 983 patients, there was a significantly higher level of satisfaction in patients who received early oral hydration after general anesthesia, rather than in the 4-hour group, with a P- value of 0.001.[15]

In our study, the post-operative flatus time was significantly reduced in group 1 than in group 2 with a p-value of 0.038. Zou Y, Zhang X, Li Y, and Liu C compared post-operative feeding at 2 hours as an experimental group and 6 hours as a control group in 70 patients who underwent lumbar discectomy under general anesthesia. Similar to our study, their study showed that the flatus time was significantly reduced in the 2-hour group compared to the 6-hour group, with a p-value of 0.001.[16] The same study showed that bloating was significantly lower in the experimental group16 unlike ours where there was no significant difference in abdominal bloating between the groups with a p-value of 0.495. In our study, there were no cases of post-operative aspiration. The above mentioned study conducted by Sun Zj. Sun X, Huo Y, et al observed that no adverse events, such as aspiration pneumonia or gastroesophageal reflux, occurred.[14] This observation is consistent with our study.

In our study, there was no significant difference in PONV grading with a p-value of 0.26. Similarly, in the study by Zou Y, Zhang X, Li Y, and Liu C, there was no significant difference in the incidence of PONV between the two groups with a p-value of 0.205.[16]

The randomized trial done by Yin X, Ye L, Zhao L, Li L, and Song J on 983 patients, showed no major differences in nausea (7.6% vs 6.5%) and vomiting (4.5% vs 4.1%) postoperatively with P values 0.53 and 0.75 respectively.[15] This study also supports our study findings regarding PONV.

LIMITATIONS

Although diversification of cases was there, most cases in the study were laparoscopic cholecystectomy.

CONCLUSION

Postoperative clear liquid can be resumed within 2 hours of general anesthesia. It decreases thirst distress and post-operative flatus time with an additional benefit of increasing patient satisfaction levels, without any difference in post-operative aspiration rate when compared to the resumption of clear liquid in 6 hours.

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