

Gastric Fluid Volume in Patients Fasting for Clear Fluid Ingestion from Midnight Versus 2 Hours Prior Laparoscopic Cholecystectomy

ANIL KUMAR¹, SYED FARJAD SULTAN², MEHAR ALI³¹Consultant Anesthesiologist, National Medical Centre, Karachi²Assistant Professor, Department of Anesthesia, Surgical Intensive Care Unit & Pain Management, Dow University of Health Sciences, Karachi³Specialist Anesthesiologist, The Indus Hospital & Health Network, KarachiCorrespondence to: Anil Kumar, Email: alkirshna@gmail.com, Cell: 0336-3104470

ABSTRACT

Objective: To assess the mean gastric fluid volume in the group ingesting clear fluid 8 hours prior to surgery (8-hour group) in comparison to the group ingesting clear liquid 2 hours prior to surgery (2-hour group)

Study Design: Randomized controlled trial

Place and Duration of Study: Department of Anesthesiology, The Indus Hospital, Karachi from 30th June 2016 to 20th May 2017.

Methodology: Sixty eligible patients were identified in the preoperative visit and all study detail was discussed with the patients and informed consent was obtained. Patients were divided into two equal groups through randomization i.e. 2 hours fasting prior to surgery versus 8 hours fasting prior to surgery. The insertion of nasogastric tube is required in all laparoscopic cholecystectomies to deflate the stomach, not only to improve surgical view but also to avoid gastric injury on trocar insertion. Aspirate from stomach was through 20ml syringe. Volume of aspirate was also noted.

Results: Mean age in 2 hours fasting prior to surgery and 8 hours fasting prior to surgery was 36.20±10.14 with CI (32.41-39.98) and 38.90±10.27 with C.I (35.06-42.73) years respectively. Five (16.7%) male and 25 (83.3%) female was enrolled in 2 hours fasting prior to surgery group and 6 (20.0%) male and 24 (80.0%) female were included in 8 hours fasting prior to surgery group. In comparison of both groups, mean of 2 hours prior to surgery group was 11.53±3.68 and in 8 hours prior to surgery group was 13.66±5.32 and P value found to be non-significant (p=0.076).

Conclusion: There was no significant difference in mean gastric fluid volume between the group ingesting clear fluid 8 hours prior to surgery (8-hour group) in comparison to the group ingesting clear liquid 2 hours prior to surgery (2-hour group).

Keywords: Gastric fluid, Preoperative fasting, Cholecystectomy

INTRODUCTION

Cholecystectomy is a procedure whereby gall bladder was removed and previously done by an open method. This is now almost completely replaced by laparoscopic cholecystectomy which has a low rate of complications, a short hospital stay and offers the patient a more comfortable postoperative period.¹ Patients should be kept NPO for a specific period of time before any surgical procedure.

NPO is an abbreviation for “nil per os”, which is Latin for nothing by mouth. The practice of keeping patient fasting for a specific period of time started in 1946 when cases of lung injury were reported and were found to be directly associated with the gastric residual volume and its pH.² The concept behind keeping the patient NPO from midnight is to reduce the gastric residual volume and its degree of acidity which reduces the risk of perioperative pulmonary aspiration.³ This is defined as aspiration of gastric contents occurring after induction of Anesthesia during procedure or in the immediate post-operative period after surgery.

However long fasting hours prior to surgery are a cause of great discomfort to the patient and the prescribed 6-8 h of fasting is usually prolonged to 12-16 h for various reasons. Research and published guidelines no longer support the routine practice of keeping NPO from midnight for both solids and fluids and it is considered appropriate to reduce the interval of clear fluids ingestion to 2 hours before surgery⁴, but the older practice still persist. Dalai et al⁵ conducted a study in which they found that fluid volume was lesser in B-group who were allowed to drink 150ml of water until two hours before surgery (5.5±3.70ml) than group I who were fasting overnight (17.1±8.2 ml) which was statistically significant. If the pH of gastric content is <2 and its volume is >25 ml then there will be an increased risk of pulmonary aspiration. Hence keeping a patient NPO from midnight is considered a safe practice.⁶

Nothing by mouth after midnight for both solids and clear fluids is a routinely followed practice in our hospital, which is a major reason for patient discomfort. The reasoning for a longer period of fasting is based on the premise that gastric residual volume will be less and thus the chances of regurgitation or aspiration will be less. However, it would be important to find out if

we are able to find similar results in our population. If this study provides us with evidence that there is no difference in gastric residual volume even after shortening the period of fasting prior to surgery, we could consider this as part of our routine practice, thus helping in reducing patient discomfort.

MATERIALS AND METHODS

This randomized controlled trial was conducted at Department of Anesthesiology, The Indus Hospital Karachi from 30th June 2016 to 20th May 2017. A total of 60 patients 30 in each group as 2-hour fasting prior to surgery versus 8-hr fasting prior to surgery to compare the gastric fluid volume in the group ingesting in patients who undergone laparoscopic cholecystectomy. All patients between 20 to 60 years of age irrespective of their gender, ASA 1 and ASA2, and undergoing laparoscopic cholecystectomies were included. All patients having emergency surgeries, history of acid peptic disease, anticipated difficult intubation, diabetes mellitus, obesity, pregnancy, hiatus hernia assessed at pre-operative and those routinely taking any medications that has an effect on gastric motility were excluded. The envelopes was follow the SNOSE protocol.² Patients in the 8-hr group was be kept fasting overnight while those in the 2-hour group was take up to 100 ml of clear fluid until 2 hr prior to surgery. After the induction of anesthesia 18 and 16 G Ryle's tube was inserted in study participants and then its position was confirmed through auscultation. The insertion of nasogastric tube may be required to deflate the stomach, not only to improve surgical view but also to avoid gastric injury on trocar insertion.³ Aspirate was acquired through 20ml syringe. Volume of aspirate was noted. Sex, age, weight, type of surgery, duration of fasting, and interval between ingestion of clear fluid and surgery was also documented. At the time of data collection, Dr. Anil Kumar and Dr. Mehar Ali were doing their residency in Anesthesiology and Dr. Syed Farjad Sultan was working as Anesthesia Consultant and Supervisor at The Indus Hospital, Karachi. Data was entered and analyzed using SPSS-21. Independent sample t-test was applied to assess significant difference in gastric fluid volume between study groups and p-value ≤0.05 was significant.

RESULTS

There were 5 (16.7%) males and 25 (83.3%) females in 2 hours fasting prior to surgery group and 6 (20.0%) males and 24 (80.0%) females in 8 hours fasting prior to surgery group (Table 1). In group wise distribution of BMI category (21-26) and (>26) 19 (63.3%), 16 (53.3%) and 11 (36.7%), 14 (46.7%) patients were enrolled in 2 hours fasting prior to surgery group and 8 hours fasting prior to surgery group respectively (Table 2).

Mean age of present study participants were in 2 hours fasting prior to surgery and 8 hours fasting prior to surgery was 36.20 ± 10.14 and 38.90 ± 10.27 years respectively. Mean duration of fasting in 2 hours prior to surgery and 8 hours fasting prior to surgery was 2.33 ± 1.14 and 8.02 ± 1.56 hours respectively. Mean duration of BMI in 2 hours fasting prior to surgery and 8 hours fasting prior to surgery was 26.59 ± 2.71 and 25.83 ± 2.79 hours respectively (Table 3). In comparison of both groups mean of 2 hours prior to surgery group was 11.53 ± 3.68 and in 8 hours prior to surgery group was 13.66 ± 5.32 and P value found to be non-significant i.e. ($p=0.076$) [Table 4].

Table 1: Frequency of genders in both group (n=60)

Gender	Group	
	2 Hours	8 Hours
Male	5 (16.7%)	6 (20%)
Female	25 (83.3%)	24 (80%)

Table 2: Distribution of BMI category in both group (n=60)

BMI (kg/m ²)	Group	
	2 Hours	8 Hours
21 – 26	19 (63.3%)	16 (53.3%)
> 26	11 (36.7%)	14 (46.7%)

Table 3: Descriptive statistics of age, duration of fasting and BMI in both group (n=60)

Variable	2 Hours	8 Hours	P value
Age (years)	36.20 ± 10.14	38.90 ± 10.27	0.309
Duration of fasting (hours)	2.33 ± 1.14	8.02 ± 1.56	0.052
BMI (kg/m ²)	26.59 ± 2.71	25.83 ± 2.79	0.402

Table 4: Comparison of mean gastric fluid volume in both groups (n=60)

Gastric fluid volume (ml)	Group		P value
	2 Hours	8 Hours	
	11.53 ± 3.68	13.66 ± 5.32	0.076

DISCUSSION

Overnight fasting could be a better option for gastric aspiration.² Whereas, Cochrane database has showed that prolonged pre-operative fasting might lead to lower gastric fluids and patients should be permitted to take significant oral fluids to improve or maintain gastric volume or pH.³ For the assessment of safe ingestion, we decide to give water prior 2-hours to surgery. Routine pre-operative surgical protocols follow general practice of overnight fasting before surgery to avoid any related hazard.⁷ But unfortunately, this practice is blindly applied to both solids and liquids without even knowing the consequences.⁸

Time required for complete digestion of solid food depends on type of food consumed. This time was comparatively longer for

fats and cellulose than to carbohydrate and protein.⁹ Complete elimination of food from stomach usually takes 3-6 hours but sometimes it prolonged due to stress, pain or opioids.¹⁰ That's why, it is more preferable to not consume any solid food before surgery. However, studies also showed that, emptying of stomach after carbohydrate drink is completed within two hours of ingestion.¹¹

At anesthesia administration, gastric fluid volume varies from person to person. Sometime even the patients are with fasting, his/her stomach is not completely empty. Normally, 25-30ml of gastric fluid stays inside the stomach for hours.^{12,13} When it is compared with regular cut off values of gastric fluid volume, higher incidence of pulmonary aspiration risk gets associated with it.¹⁴

CONCLUSION

Non-significant difference was found in mean gastric fluid volume between the group ingesting clear fluid 8 hours prior to surgery (8-hour group) in comparison to the group ingesting clear liquid 2 hours prior to surgery (2-hour group).

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