

## Original Research Article

# COMPARATIVE STUDY OF EFFECT OF DIFFERENT DURATIONS OF PREOPERATIVE FASTING ON GASTRIC pH AND VOLUME - A PROSPECTIVE RANDOMIZED DOUBLE BLIND STUDY

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**ABSTRACT**

**Background:** Preoperative fasting is defined by the American Society of Anaesthesiologists (ASA) as the prescribed period of time before a surgical procedure when patients are not allowed the oral intake of liquids and solids.

**Objective:** to evaluate the effect of different intervals of preoperative fasting on the gastric volume and pH and assess its effects on the perioperative hemodynamic parameters and patient's symptoms and signs of wellbeing.

**Material and Methods:** This prospective, double blind, randomized, comparative study was conducted at Sri Sathya Sai institute of higher medical sciences, Whitefield, Bengaluru. Duration of study was 2 years - (August 2019- August 2021). One hundred and twenty patients belonging to ASA grade I and II of ages between 18-60 years undergoing elective surgeries under general anaesthesia with endotracheal intubation.

**Results:** From our study it was observed that there was statistically significant difference in the gastric volume between the three groups. The highest value was noted in group B and the least value was noted in group C. No statistically significant difference was noticed among the three groups with respect to the pH of the aspirated gastric fluid. Clinical signs of dehydration and symptoms of patient morbidity showed statistically significant difference between the three groups with favorable outcome in group C.

**Conclusion:** In conclusion it was apparent that reduced preoperative fasting periods would benefit patients with decreased gastric volumes, normal range of gastric pH, stable hemodynamic parameters and increased patient comfort without increasing the risk of pulmonary aspiration in the perioperative period.

**Keyword:** Durations of preoperative fasting, Gastric ph, Volume.

**INTRODUCTION**

Adults and children are required to fast before anaesthesia to reduce the risk of regurgitation and aspiration of gastric contents. The purpose of the

ASA guidelines is to provide direction for clinical practice related to preoperative fasting and to reduce the risk of perioperative pulmonary aspiration and its complications.<sup>[1]</sup>

## ASA preoperative fasting guidelines<sup>1</sup>

	No of hours of preoperative fasting
Clear liquids	2 or more hours
Breast milk	4 or more hours
Infant formula	6 or more hours
Solids and nonhuman milk	6 or more hours
Fatty food, meat	8 or more hours

The concept of preoperative fasting came into practice after the publication of Lester Mendelson's classic paper "The aspiration of stomach contents into the lungs during obstetric anaesthesia".<sup>[2]</sup> In the era of evidence-based medicine and enhanced recovery there is no definite scientific evidence to keep the patient fasting for a prolonged duration. Extended duration of fasting can result in hunger, thirst, anxiety, electrolyte imbalance, distress, confusion, hypoglycaemia, headache, dehydration, postoperative nausea and vomiting.<sup>[3]</sup>

Prolonged periods of fasting preoperatively can lead to unstable hemodynamic parameters leading to potentially harmful influence on cardiac preload. In addition, it increases inflammatory responses and exacerbates insulin resistance, muscle proteolysis and lipolysis which are mediated by the release of cytokines and counter regulatory hormones. Peripheral insulin resistance may produce hyperglycaemia which is highly associated with the increased length of hospital stay and postoperative complications.<sup>[4]</sup>

## MATERIALS AND METHODS

This prospective, double blind, randomized, comparative study was conducted at Sri Sathya Sai institute of higher medical sciences, Whitefield, Bengaluru. Duration of study was 2 years - (August 2019- August 2021).

One hundred and twenty patients belonging to ASA grade I and II of ages between 18-60 years undergoing elective surgeries under general anaesthesia with endotracheal intubation.

### Sampling size and technique

The sample size was calculated using the effect size and the highest standard deviation, which provided the maximum sample size to detect three pair wise differences using one way ANOVA. The other parameters considered for sample size calculation were 99% power of study and 5% two sided alpha error.

The sample size was calculated using the G power\*statistical software.

As per the above mentioned parameters the required sample size was 33 subjects in each group. To account for a nonparticipation rate of about 20% (7 subjects) it was decided to sample about 40 subjects in each group.

### Inclusion Criteria

All Patients between the age 18-60 years undergoing elective surgery belonging to ASA grade 1 and 2 were included.

Reducing the period of fasting will potentially reduce the surgical stress and provide better hemodynamic stability intraoperatively and postoperatively and also markedly reduces postoperative insulin resistance which has beneficial effects on postoperative glucose and protein metabolism which seems to have a beneficial effect with regard to perioperative thirst, hunger, anxiety, muscle strength and overall comfort of the patient.<sup>[5]</sup>

Definitive measures should be taken to alleviate the patients' discomfort associated with prolonged preoperative fasting. Evaluation of other potential factors that may influence the patients' fasting period and the perioperative outcome should also be carried out. The ASA in its practice guidelines has also mentioned about the lacunae in literature on this topic.

So the current study was conducted to evaluate the effect of different intervals of preoperative fasting on the gastric volume and pH and assess its effects on the perioperative hemodynamic parameters and patient's symptoms and signs of wellbeing.

### Exclusion Criteria

- Patients undergoing emergency surgery
- Patients of ASA physical status 3,4 and 5
- Patients of age <18 years and age >60 years.
- Patients receiving preoperative mannitol.
- Patients with airway control other than endotracheal intubation.
- Current history of psychiatric disorder, or presently on psychotropic medications.
- Patients with GERD, hiatus hernia and conditions associated with delayed gastric emptying, sepsis, trauma.
- Pregnant patients

### Randomization

Computer based randomization was carried out and the patients were randomly assigned into 3 groups.

Group A - patients were fasted overnight

Group B - patients with preoperative fasting for oral clear fluids of 6 hours duration

Group C - patients with preoperative fasting for oral clear fluids of 2 hours duration

### Data collection technique

In addition to the preoperative vital signs and fasting status, hemodynamic parameters were recorded intra operatively and post operatively.

Gastric volume and pH data was obtained from the laboratory analysis

Patients' Subjective symptoms like thirst, hunger, dryness of mouth and anxiety were assessed

Patients' Objective signs like capillary refill time and skin turgor were noted.

## Method of Study

- After scientific and ethical committee's approval (DCGI number-EC/19/000217) on 12/08/2019 and 23/08/2019 respectively, the study was initiated. Written informed consent of patients was obtained. A thorough preoperative assessment that included detailed history taking, physical examination and relevant laboratory investigations were carried out.
- The patients were explained in their native language, the nature of the study.
- The patients were randomly allocated to one of the 3 groups and the preoperative fasting duration was decided accordingly.
- Patients in group A were given routine fasting orders (NPO from midnight).
- Patients in group B were allowed to take clear fluids (2ml/kg) orally up to 6 hours prior to the induction of anesthesia.
- Patients in the group C were allowed to take clear fluids (2ml/kg) orally up to 2 hours prior to induction of anesthesia.
- On arrival of the patient to the operating room, ASA standard monitors were applied.
- Patient was induced with intravenous fentanyl 2µg/kg, thiopentone 3-5 mg/kg.
- Intravenous pancuronium 0.1 mg /kg body weight was administered to facilitate endotracheal intubation.
- Following induction of anaesthesia an orogastric tube of appropriate size based on age and gender of the patient was passed and the gastric contents were aspirated, volume was measured and the contents were sent for laboratory analysis. pH of the aspirated gastric contents was determined using a calibrated microprocessor based pH meter (Systronics - model 361) in the laboratory
- General anaesthesia was maintained with 1% isoflurane in a mixture of 50% oxygen and 50% nitrous oxide and intermittent bolus doses of fentanyl and pancuronium as per the institutional protocol.
  - Hemodynamic parameters and the objective vitae throughout the operative period at pre specified intervals was recorded.
  - The subjective parameters were noted before induction and after extubation.

- The data obtained thus was compiled and analyzed statistically.

## Statistical Analysis

Data was statistically described in terms of mean ( $\pm$ SD), frequencies (number of cases), and percentages wherever appropriate. Data was tested first for normal distribution by the Kolmogorov-Smirnov test. Data was also represented using appropriate diagrams like bar diagrams and line diagrams

Quantitative data between the three groups was analysed with the one way ANOVA test and the quantitative data within the 3 groups was analysed with the Post Hoc Turkey test.

F value with the Welch test and p value was determined for the data.

For comparing categorical data, a Chi-square test was performed.

A probability value (p-value) less than 0.05 was considered as statistically significant.

## RESULTS

Our study was carried out in Sri Sathya Sai Institute of Higher Medical Sciences, Bengaluru in a total number of 120 patients. They were randomly divided into 3 groups of 40 each.

Group A - patients who were fasted overnight.

Group B - patients with preoperative fasting for oral clear fluids of 6 hours duration.

Group C - patients with preoperative fasting for oral clear fluids of 2 hours duration.

Among the 3 groups with the mean age in group A being  $38.4 \pm 13.05$ , in group B being  $42.73 \pm 10.28$  and in group C being  $40.93 \pm 12.6$ .

There is no statistically significant difference between the three groups in terms of mean age of the patients with a test value of 1.243 and p value of 0.295.

A total of 55.8% females and 44.2% males participated in the study with group B having the highest number of female participants (62.5%) and group A having the least number of female participants (42.9%). Group A had the highest number of male participants (57.1%) and group B had the least number of male participants (37.5%). There was no statistically significant difference between the 3 groups with respect to the gender distribution with a p value of 0.180.

**Table 1: Distribution of BMI between the 3 groups**

Group	Mean BMI	F value	P value
A	23.95 $\pm$ 3.69	4.478	0.075
B	24.43 $\pm$ 2.9		
C	22.79 $\pm$ 2.27		

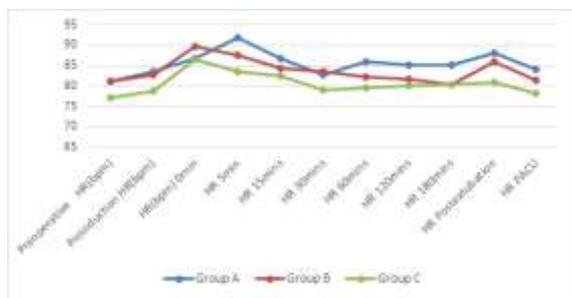
Comparison of BMI (kg/m<sup>2</sup>) between the three groups shows that group B has the highest value of 24.43 $\pm$ 3.69 and group C has the least value of 22.79 $\pm$ 2.27.

This difference is statistically insignificant with a test value of 4.478\* and p value of 0.075.

- Comparison of heart rate between the 3 groups showed a statistically significant difference

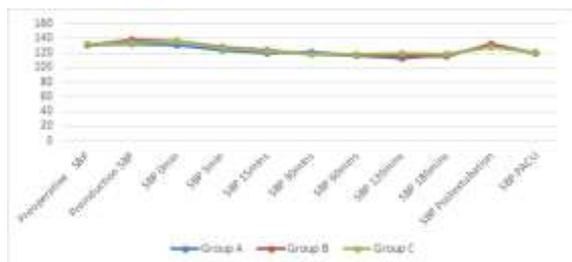
between the groups at an interval of 5 mins after induction of anaesthesia, in the postoperative period and in the PACU

- Group A has the highest value of  $91.94 \pm 17.66$  and group C has the least value of  $83.56 \pm 10.69$  at 5 mins following induction. This difference is statistically significant with a test value of 3.416 and p value of 0.038.
- Group A has the highest value of  $88.09 \pm 11.09$  and group C has the least value of  $80.91 \pm 10.29$  in the post extubation period. This difference is statistically significant with a test value of 3.877 and p value of 0.02
- Group A has the highest value of  $84 \pm 11.35$  and group C has the least value of  $78.22 \pm 9.04$  in the PACU. This difference is statistically significant with a test value of 3.124 and p value of 0.048.
- The comparison of heart rate among the three groups at other intervals showed no statistically significant difference between the 3 groups.



**Figure 1: Line diagram showing the comparison of heart rate among the 3 groups at various intervals**

Comparison of SBP between the 3 groups showed no statistically significant difference at any interval in the perioperative period.



**Figure 2: Line diagram showing the comparison of SBP at various intervals between the 3 groups**

Comparison of DBP between the 3 groups showed a statistically significant difference at intervals of 5 mins, 10 mins, and 120 mins following induction of anaesthesia.

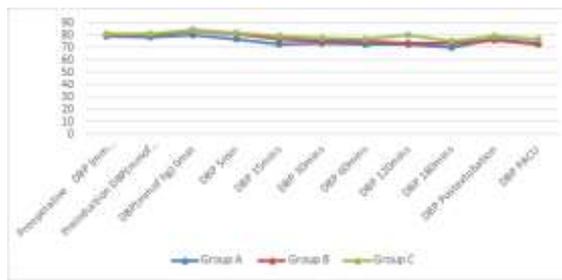
Group C has the highest value of  $82.11 \pm 7.45$  and group A has the least value of  $76.86 \pm 10.01$  at 5 mins following induction. This difference is statistically significant with a test value of 3.706 and p value of 0.028.

Group C has the highest value of  $79.42 \pm 7.24$  and group A has the least value of  $73 \pm 7.4$  at 15 mins

following induction of anaesthesia. This difference is statistically significant with a test value of 7.019 and p value of 0.001.

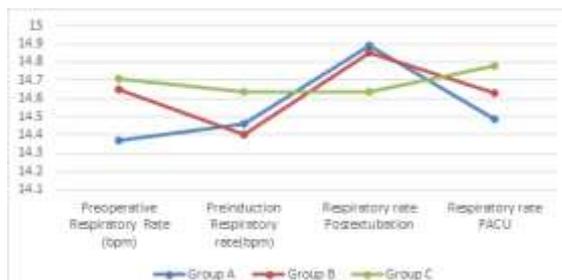
Group C has the highest value of  $79.86 \pm 9.37$  and group A has the least value of  $72.27 \pm 7$  at 120 mins following induction of anaesthesia. This difference is statistically significant with a test value of 6.13 and p value of 0.003.

The DBP at all other intervals showed no statistically significant difference among the 3 groups measured during the perioperative period.



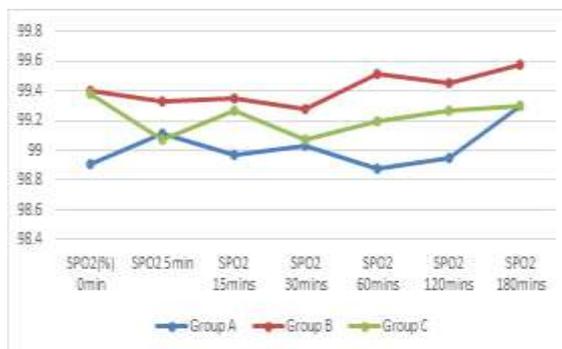
**Figure 3: Line diagram showing the comparison of DBP at various intervals among the three groups**

Comparison of respiratory rate at various intervals in the preoperative, preinduction, post extubation and PACU intervals showed no statistically significant difference between the 3 groups.



**Figure 4: Line diagram showing the comparison of respiratory rate among the 3 groups at the above mentioned intervals**

Comparison of SPO2 at various intervals in the perioperative period showed no statistically significant difference between the 3 groups.



**Figure 5: Line diagram showing the comparison of SPO2 at various intervals among the 3 groups**

**Table 2: Comparison of volume of gastric fluid aspirated among the three groups**

Group	Volume of gastric fluid(ml)	P Value	F value
Group A	6.99±2.85	0.015	4.336
Group B	8.7±3.8		
Group C	6.77±2.96		

Comparison of volume of gastric fluid aspirated (ml) between the three groups shows that group B has the highest value of 8.7±3.8ml and group C has the least value of 6.767±2.96ml. This difference is statistically significant with a test value of 4.336 and p value of 0.015.

Post hoc Tukey tests comparing group A and group B shows a mean difference of -1.7143 and is not

statistically significant with a p value of 0.062. Comparing group A and group C shows a mean difference of 0.219 and is not statistically significant with a p value of 0.952. Comparing group B and group C groups shows a mean difference of 1.9333 and is statistically significant with a p value of 0.019.

**Table 3: Comparison of pH of the aspirated gastric fluid among the three groups**

	Ph of aspirated gastric fluid	P Value	F value
Group A	4.47±2.38	0.849	0.164
Group B	4.62±2.62		
Group C	4.32±2.07		

Comparison of pH of gastric fluid aspirated between the three groups shows that group B has the highest value of 4.62±2.62 and group C has the least value of 4.32±2.07. This difference is statistically insignificant with a test value of 0.164 and p value of 0.849.

Post hoc Tukey tests comparing group A and group B shows a mean difference of 0.147 and is not

statistically significant with a p value of 0.961. Comparing group A and group C shows a mean difference of 0.1452381 and is not statistically significant with a p value of 0.96. Comparing group B and group C shows a mean difference of 0.2924167 and is not statistically significant with a p value of 0.835.

**Table 4: Comparison of capillary refill time(seconds) of patients among the three groups**

	Group A	Group B	Group C	P Value	F value
Preoperative	2.86±0.49	2.78±0.53	2.6±0.54	0.083	2.566
Preinduction	3.31±0.53	2.85±0.36	2.67±0.48	<0.001	16.249
Post extubation	3.43±0.61	3.05±0.39	2.58±0.5	<0.001	24.413
PACU	3.46±0.56	3.1±0.3	2.47±0.51	<0.001	38.579

Comparison of preoperative capillary refill time (seconds) between the three groups shows that group A has the highest value of 2.86±0.49 and Group C has the least value of 2.6±0.54. This difference is statistically insignificant with a test value of 2.566 and p value of 0.083

Comparison of preinduction capillary refill time± between the three groups shows that group A has the highest value of 3.31±0.53 and group C has the least value of 2.67±0.48. This difference is statistically significant with a test value of 16.249 and p value of <0.001.

Comparison of post extubation capillary refill time between the three groups shows that group A has the highest value of 3.43±0.61 and group C has the least value of 2.58±0.5. This difference is statistically significant with a test value of 24.413 and p value of <0.001.

Comparison of capillary refill time in the PACU between the three groups shows that group A has the highest value of 3.46±0.56 and group C has the least value of 2.47±0.51. This difference is statistically significant with a test value of 38.579 and p value of <0.001.

**Table 5: Comparison of skin turgor at various intervals among the three groups**

	Group A	Group B	Group C	P Value	F value
Preoperative	2.77±0.55	2.73±0.45	2.49±0.51	0.025	3.8
Preinduction	3.14±0.49	2.9±0.38	2.49±0.51	<0.001	17.781
Post extubation	3.49±0.66	3.05±0.32	2.47±0.51	<0.001	33.9
PACU	3.46±0.56	3.05±0.45	2.42±0.5	<0.001	39.706

Comparison of preoperative skin turgor between the three groups shows that group A has the highest value of 2.77±0.55 and group C has the least value of 2.49±0.51. This difference is statistically significant with a test value of 3.8 and p value of 0.025.

Comparison of preinduction skin turgor between the three groups shows that group A has the highest value of 3.14±0.49 and group C has the least value of 2.49±0.51. This difference is statistically significant with a test value of 17.781 and p value of <0.001.

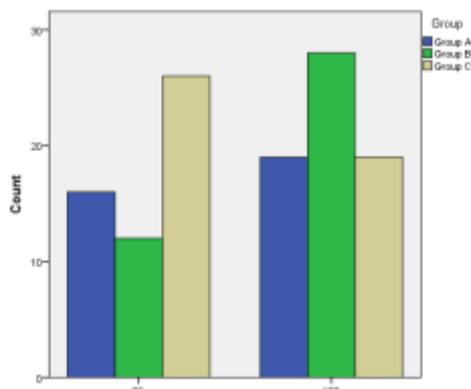
Comparison of postoperative skin turgor between the three groups shows that group A has the highest value of  $3.49 \pm 0.66$  and group C has the least value of  $2.47 \pm 0.51$ . This difference is statistically significant with a test value of 33.9\* and p value of  $<0.001$ .

Comparison of PACU skin turgor between the three groups shows that group A has the highest value of  $3.46 \pm 0.56$  and group C has the least value of  $2.42 \pm 0.5$ . This difference is statistically significant with a test value of 39.706 and p value of  $<0.001$ .

The patients' complaint of thirst in the preinduction period is statistically significant between the 3 groups with a P value of  $<0.001$ . A total of 63.3% of patients in the study had the complaint of thirst in the preinduction period. 91.4% in group A had the highest positive responses to a question of if they were thirsty in the preinduction period and only 33.3% of patients in group C replied with a yes to the same question. 72.5% patient in group B complained of thirst in the preinduction period.

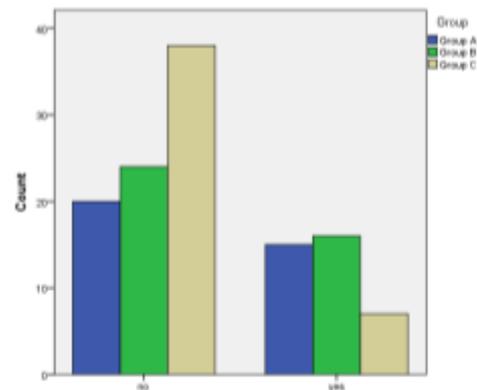
A total of 55% (66) patients complained of dryness of the mouth among the participants included in the study of which the highest number were in group B with 70% (28) and the least was in group C with 42.2 (19). In group A 54.3% (19) patients complained of dryness of mouth in the preinduction period.

This difference is statistically significant with a p value of 0.013.



**Figure 6: Bar chart showing the comparison of dryness of mouth in the preinduction period**

Comparison of hunger in the preinduction period resulted in a total of 31.7% replying with an affirmative when asked if they were feeling hungry in the preinduction period of which group A had the highest number of patients 42.9% (15) and group C had the least number of patients with the complaint of hunger 15.6% (7). In group B 40% (16) patients complained of hunger in the preinduction period. This difference is statistically significant with a p value of 0.013.



**Figure 7: Bar chart showing the comparison of hunger between the 3 groups in the preinduction period**

The comparison of anxiety in the preinduction period among the patients in the 3 groups did not yield statistically significant results. The highest number of patients with complaints of anxiety were in group B with 85% (34) and the least number of patients with complaints of anxiety were in group A 60% (21). Group C had 73.3% (33) patients with complaints of anxiety.

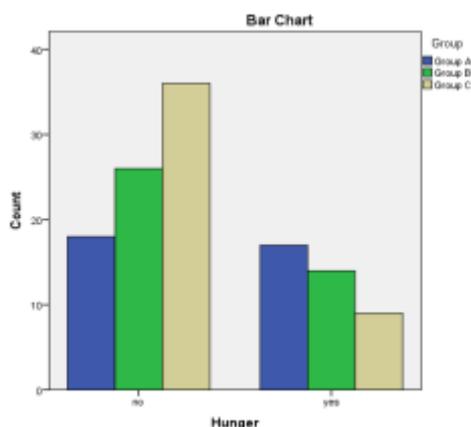
The comparison of thirst in the post-operative period among the 3 groups is statistically significant with p value of  $<0.001$ . A total of 60% (72) patients complained of thirst in the study in the postoperative period. Group A had the highest number of patients complaining of thirst 91.4% (32) and group C had the least number of patients complaining of thirst 26.7% (12) in the postoperative period. In group B 70% (28) patients complained of thirst in the postoperative period.

The comparison of dryness of mouth among the 3 groups in the postoperative period is statistically significant with a p value of  $<0.001$ . A total of 69.2% (83) complained of dryness of mouth with the highest number of patients from group A 88.6%(31) and the least number of patients from group C 44.4%(20). In group B 80%(32) patients complained of dryness of mouth in the postoperative period.

Comparison of hunger among the patients in the 3 groups showed statistically significant difference with p value of 0.026.

Total of 33.3% (40) patients complained of hunger in the postoperative period with the highest number from group A 48.6%(17) and the least number of patients in group C with 20%(9).

Group B had 35% (14) patients with complaints of hunger.

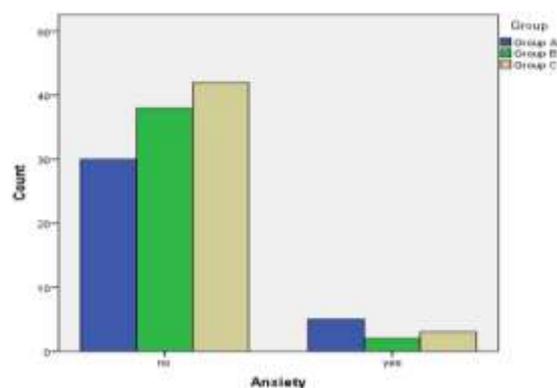


**Figure 8: Bar chart showing the comparison of hunger among the patients in the 3 groups in the postoperative period**

The comparison of anxiety in the postoperative period showed no statistically significant difference among the patients in the 3 groups with the p value of 0.306.

The total number of patients who complained of anxiety among the 3 groups were 8.3% (10) in the postoperative period.

14.3% (5) patients complained of anxiety in group A and 5% (2) in group B and 6.7% (3) in group C.



**Figure 9: Bar chart showing the comparison of anxiety among the patients in the 3 groups in the postoperative period**

## DISCUSSION

Gender, age, BMI and ASA grade were comparable between the 3 groups of our study population of patients similar to the research work carried by Kajal et al, Malcolm scar et al, Roger Maltby et al.<sup>[6,7,8]</sup>

### Intragastric volume and pH

It was found that there was a statistically significant difference with respect to the volume of gastric fluid aspirated between the present study groups of patients with a mean value of 4.338ml. It was observed that the least volume was in group C (value of 6.767ml) and the highest volume was in group B (value of 8.7ml). The difference is statistically significant (p value of 0.015. Similarly Kajal S Dalal et al<sup>8</sup> reported lesser volume of

gastric aspirate in their patients who received 150 ml of water 2 hours preoperatively versus patients fasted overnight.

Whereas there was no statistically significant difference between the 3 groups with respect to the pH of the gastric fluid aspirated with a p value of 0.849 and f value of 0.164. The mean pH of the aspirated gastric fluid being 4.47 in group A, 4.62 in group B and 4.32 in group C subjects and so the difference was statistically insignificant. In contrast to aligned studies conducted by Malcolm Scarr et al,<sup>[6]</sup> Roger maltby et al,<sup>[7]</sup> Riaz Hussain et al,<sup>[9]</sup> no correlation was found between the number of hours of preoperative fasting, volume of fluid ingested preoperatively and the volume and pH of the gastric aspirate.

There was substantial evidence,<sup>[1,6,7,8]</sup> that preoperative ingestion of fluid 2 hours prior to the induction of anaesthesia does not increase the risk for pulmonary aspiration in the perioperative period. An update on preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration, in 2017 by the American Society of Anaesthesiologists Task force reported equivocal findings for gastric volume and gastric pH values in adult patients given clear liquids 2 to 4 hours before a procedure versus more than 4 hours. (category A1-E evidence). A meta-analysis of RCTs reports a lower risk of aspiration (i.e., gastric volume < 25mL and pH > 2.5) when clear liquids are given 2 to 4 hours before a procedure (category A1-B evidence).<sup>[1]</sup>

While the studies that were conducted by Jonathan Hausel et al, OV Ajuziegu et al, Yagci et al, Nakamura et al, by administering carbohydrate rich drink at various intervals preoperatively showed no significant change in the residual gastric volume and pH. The authors concluded that it is safe to administer carbohydrate rich fluids in the preoperative period.<sup>[5,10]</sup>

### Hemodynamic parameters

Heart Rate showed a statistically significant difference at 5 mins post induction, post extubation and in the PACU with group A patients having the highest value (5mins post induction-91.94, post extubation-88.09, PACU- 84) whereas group C patients (5mins post induction-83.56, post extubation-80.91, PACU-78.22) had the least value. In similar lines comparison of the DBP between the 3 groups showed a statistically significant difference at 5, 15 and 120 mins post induction, and post extubation with group A patients (5mins post induction-76.86, 15mins post induction-73, 120mins post induction-72.27, post extubation-77.92) having the least value while group C patients (5 mins post induction-82.11, 15mins post induction-79.42, 120mins post induction-79.86, post extubation-79.4) having the highest value. Though there was a statistically significant difference found in the 3 groups at the above intervals the difference was not clinically apparent and it did not affect the overall

hemodynamic stability during the perioperative period.

On the contrary Masonori tsukomoto et al studied hemodynamic changes in patients undergoing surgery as the first case(0825hours) versus the second case (1325hours) and found that there was no statistically significant changes in cardiovascular variables and body fluid (TBW, ECW, ICW).<sup>[11]</sup>

#### **Capillary refill time (CRT) and skin turgor**

Clinical indicators of dehydration,<sup>[8]</sup> such as capillary Refill time and skin turgor showed statistically significant difference with group C (preoperative-2.6±0.54, preinduction-2.67±0.48, Postextubation-2.58±0.5, PACU-2.47±0.51) having the least value and group A (preoperative-2.86±0.49, preinduction-3.31±0.53, post extubation-3.43±0.61,PACU-3.46±0.56) having the highest value for both skin turgor and capillary refill time. So it was evident that patients who fasted overnight (group A) had the highest value of these objective signs than the patients (group C) who fasted for a lesser duration of time preoperatively.

Favourably Gang Zhou studied the effect of prolonged preoperative fasting on elective gastrointestinal surgeries and reported that prolonged preoperative fasting time led to unfavourable outcomes like reoperation, prolonged postoperative mechanical ventilation and myocardial injury.<sup>[4]</sup>

Symptoms of thirst, dryness of mouth, hunger and anxiety.

Statistically significant difference was noticed among the subjective symptoms like thirst in patients between the 3 groups in the preinduction period (91.4% in group A, 72.5% in group B and 33.3% in group C) and post extubation period (88.6% in group A 80% in group B and 44.4% in group C).

Similarly incidence of dryness of mouth showed a statistically significant difference between the 3 groups of patients in the preinduction period (42.9% in Group A, 40% in group B and 15.6 % in group C) and post extubation period (48.6% in group A, 35% in group B and 20% in group C).

While other subjective symptoms like anxiety showed no significant incidence either in the preinduction or the post extubation period.

ASA Task Force in its update in 2017 on preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration, reported less thirst and hunger for fasting times of 2 to 4 hours versus more than 4 hours of fasting after reviewing various RCTs (Category A2-B evidence).<sup>[1]</sup>

Similar RCTs comparing nutritional or carbohydrate drinks at 2 to 4 hours versus more than 4 hours of fasting, reported equivocal findings for gastric volume, gastric pH, blood glucose values, hunger, and thirst. (Category A2-E evidence).<sup>[1]</sup>

Brady MC in their Cochrane review of various RCTs assessed the effect of preoperative fasting regimens on perioperative complications and patient wellbeing and the authors concluded that a shortened preoperative fasting duration for clear liquids of 2 hours did not significantly increase the risk of pulmonary aspiration while simultaneously decreasing the morbidity of the patient with respect to complaints of hunger, dryness of mouth, thirst and anxiety.<sup>[26]</sup>

## **CONCLUSION**

Increasing the duration of preoperative fluid fasting also increased the residual gastric volume while having no effect on the pH of the gastric fluid.

Reducing the duration of preoperative fluid fasting also resulted in increased patient comfort and maintenance of stable perioperative hemodynamics. Thus administration of clear fluids, up to two hours before the induction of anaesthesia does not increase the risk of pulmonary aspiration while also improving patient comfort and wellbeing in the perioperative period.

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