

Shorter Fasting Time Before & After Operations: Need to Change the Traditional Fasting Protocols of Surgical Patients?

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ABSTRACT

Objective: To provide evidence that shorter fasting time, until 2 hours before and after elective operations under general anesthesia (GA) or subarachnoid block (SAB) is more beneficial and equally safe than traditional 6-8 hours nil per oral (NPO) fasting.

Study Design: Course Comparative / descriptive study

Place and Duration of Study: This study was conducted at Sheikh Khalifa Bin Zayad Alnayan Hospital (CMH) Rawalakot Azad Kashmir from January to Oct 2019.

Materials and Methods: Recovery indicators and complications were assessed in 100 selected patients of four different specialties for elective operations under GA and SAB in a tertiary care SKBZAN Hospital (CMH) Rawalakot through a performa. These patients were divided manually into two equal unmatched groups by odd and even numbers. Group-A included 50 patients who were advised routine protocol of preoperative fasting after midnight and postoperative fasting for 6-8 hours. Group-B included 50 patients who were advised shorter fasting time; 6 hours for solid diet and until 2 hours for liquid diet before and after operation.

Results: In Group-B patients almost all recovery indicators were better with lesser complications and shorter hospital stay as compared to patients of Group-A. There was saving of 1-2 IV fluid drips of 1000ml each, per patient which reduced the cost of treatment, nursing services load and financial burden over Hospital.

Conclusion: Lesser fasting time allowing liquid diet until 2 hours before and after operation under GA/SAB was more beneficial than traditional NPO after midnight before & for 6-8 hours after operation. It was safe, cost effective & significantly reduced recovery time and hospital stay. Hospitals, anesthetists and surgeons are recommended to adopt this new protocol.

Key Words: Fasting time, surgical operations, general anesthesia, subarachnoid block, liquid diet, solid diet.

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INTRODUCTION

The Traditional 6-8 hours fasting before and after any operation under General anesthesia (GA) or subarachnoid block (SAB) is advised to ensure gastric emptying, prevention of vomiting and pulmonary aspiration.^{1,2} During anesthesia, pulmonary aspiration of gastric contents is rare but has an incidence of 1 in 7000-8000 in ASA-I,II and 1 in 400 in ASA-III,IV. The risk of aspiration is still considered a significant cause of anesthesia related deaths.^{3,4}

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Pulmonary aspiration can lead to serious complications such as aspiration pneumonia, respiratory disabilities and related morbidity.⁵ Prolonged fasting can actually increase the risk of pulmonary aspiration.⁶ Unfortunately NPO order is blindly applied to both solid and liquid diets and has become a routine in our practice of anesthesia.⁷ The time required for solid food to liquefy is shorter for carbohydrates and proteins as compared to fats and cellulose.⁸ Complete emptying of solid food from the stomach takes 3 to 6 hours, but may be prolonged by fear, anxiety, pain or opioids.⁹ However, the gastric emptying of liquid diet is faster and after intake of a carbohydrate drink is complete within 2 hours of ingestion.¹⁰

The Policy of NPO after midnight before and 6-8 hours after surgery begun in 1960.¹¹ An other factor which increases fasting time is delay in operations & transfer time to the place of operation. This prolonged NPO protocol needs modifications because of many complications particularly hypoglycemia, dehydration and metabolic stress which can slow down recovery of the patients and increase in operative complications. There is transient increase in glucagon and decrease in

insulin levels leading to insulin resistance & decreased glucose uptake by cells simulating type-2 Diabetes mellitus.¹² Depletion of glycogen levels intensifies the postoperative metabolic stress.¹³ Main oral bad effects of prolonged NPO are dryness of mouth, tongue and throat leading to difficulty in speaking.¹⁴ Prolonged NPO can lead to poor nutrition and psychological stress which may result in malnourishment, delayed wound healing and increased risk of wound dehiscence.¹⁵ Lying on bed for a long time after surgery with IV drips due to 6 hours or more NPO, increases risk of complications such as thrombo-embolic disorders like deep venous thrombosis, transient ischemic attacks, pulmonary embolism etc., postoperative ileus, infections, respiratory infections, cardiac complications and muscle wasting. It is therefore necessary to get out of bed as soon as possible after surgery to carry out normal activities. As prolonged NPO is not based on strong evidence, there is no solid reason why every patient should be kept "NPO" for 6 hours or more before & after surgery.¹⁶

Fasting guidelines have been relaxed in recent years for elective fit patients but traditional after midnight NPO order is still practiced for emergency and high risk patients. Prolonged fasting can lead to feeling of thirst, hunger, anxiety, headache, nausea, dizziness and dehydration leading to difficulty in drawing blood for necessary tests. American Society of Anesthesiologists recommends clear liquids such as water, ORS, Pedialyte, candies, broth, tea, black coffee, carbonated beverages & fruit juices without pulp until 2 hours before and after surgery. Light meals like toast and tea with milk until 6 hours and heavy meal such as fried fatty foods, and meat should be taken until 8 hours before & after surgery. Less fasting creates a higher postoperative anabolic state.¹⁷ Taking fluid diet until 2 hours before surgery significantly reduces risk of postoperative nausea & vomiting.¹⁸ Prolonged withholding of oral fluids don't improve gastric pH or volume, and permitting a patient to drink fluids preoperatively may even result in significantly lower gastric fluid volumes.¹⁹ Modern GA & SAB technique has improved its safety with negligible risk of pulmonary aspiration.²⁰ In children clear fluids can be given safely until 1 hour before and after any elective operation under GA or SAB.²¹

MATERIALS AND METHODS

Research study was carried out from January to October 2019, in Sheikh Khalifa Bin Zayad Alnayan Hospital (CMH) Rawalakot which is a tertiary care teaching hospital affiliated with Poonch Medical College Rawalakot Azad Kashmir. The departments which participated in this study were Otorhinolaryngology, Urology, General Surgery and Obstetrics & Gynecology. Approval from hospital medical ethical committee was taken. All Patients of either sex & any

age, requiring elective operations under GA or SAB, were included. Those patients who were excluded from study have gastro-esophageal reflux disorder (GERD), stomach paresis due to diabetes mellitus, or need rigid, laparotomy or extensive gut surgery. These high risk patients needed traditional 6-8 hours or more fasting before and after surgery. All 100 selected patients for elective operations under GA or SAB, were randomly divided manually by odd & even numbers into two equal unmatched groups; A & B. Group-A patients were placed on traditional fasting routine i.e. NPO after midnight and 6-8 hours after operations. Group-B patients were preoperatively counseled to have 6-8 hours NPO for solid diet and until 2 hours NPO for clear liquid diet before and after operation. Clear liquid diet advised was water, ORS, candies, sugar water, juices without pulp, broth, tea/coffee (without milk) and honey water. Milk, milk shake and pulpy juices were allowed until 4 hours before and after operations. Data regarding recovery indicators, complications, need of intravenous (IV) drips and hospital stay related to both protocols were noted by the treating doctor on a well-designed performa for each patient. Collected data was evaluated and analyzed by using SPSS-21. P-Value of less than 0.05 was considered significant. The P-values were computed through statistical package Minitab using hypothesis test for two independent proportions for each category.

RESULTS

Mean age of patients was 27.4 years and range was 4 to 80 years. Male patients were 56 and female 44. In Group-B patients almost all recovery indicators were better as compared to patients of Group-A (table.1).

Table No. 1: Recovery indicators and complications.

Sr. No	Features	Group-A (No. of patients)	Group-B (No. of patients)	P-Value
1	Aspiration during anesthesia	Nil	Nil	
2	Feeling of thirst	48	5	<0.001
3	Feeling of hunger	44	7	<0.001
4	Anxiety/Stress	43	8	<0.001
5	Early mobilization of patient	6	48	<0.001
6	Nausea	15	4	0.048
7	Postoperative Vomiting	8	2	0.137
8	Pain abdomen	5	1	0.189
9	Need of IV drips/Fluids	50	24	0.047
10	Early recovery from operation	24	47	<0.001
11	Feeling of being comfortable	33	45	0.005
12	Wound infection	5	2	0.435

The categories of feeling of thirst, feeling of hunger, anxiety/stress, early mobilization of patient, nausea, need of IV drips, early recovery from operation (within expected duration) and feeling of being comfortable shows the significant differences favoring group-B as compared to group-A patients at 5% level of significance. The categories of postoperative vomiting, pain abdomen and wound infection shows the insignificant differences while comparing to 5% level of significance.

Total length of hospital stay in days is reduced by 1-1.5 days in Group-B patients as compared to Group-A patients (Table-2). This increased the patient's turnover and cost of medical care per patient. There was a saving of 1-2 IV drips of 1000ml each, per patient in Group-A as compared to Group-B patients; which reduced the cost of treatment, nursing services load and financial burden over Hospital (Table-3).

Table No.2: Average Hospital stay

Name of Department	Average Hospital stay in days in Group-A patients	Average Hospital stay in days in Group-B patients
General surgery	4.5	3
Gynecology & Obstetrics	4	3
Otorhinolaryngology	3.5	2.5
Urology	4	3

Table No.3: Average Need of postoperative IV drips(1000ml) per patient

S. No	Name of Department	No. of IV drips used per patient in Group-A	No. of IV drips used per patient in Group-B
1	Otorhinolaryngology	2	Zero
2	General surgery	4	2
3	Gynecology & Obstetrics	3	2
4	Urology	2	1

DISCUSSION

Results of this study indicate that patients of both sexes and all ages were included. The male to female ratio was 1.3:1 and age range was 5 to 80 with mean age of 34 years. There was no case of pulmonary aspiration in both groups although there was a theoretical risk in group-B patients. This result is similar to other research studies.^{3,4,21} Brady et al (2010), after review of randomized controlled trials concluded that those patients who took clear fluid diet until few hours before surgery were at no greater risk of pulmonary aspiration than those who were advised traditional NPO after mid night. Moreover those patients who fasted for the shorter time also had low gastric volume.²² Notable benefits of lesser fasting in Group-B patients were less feeling of thirst, hunger, nausea and anxiety/stress; feeling of being comfortable and early mobilization of

patient as well as early recovery from operation as compared to group-A patients (Table-1). These results are statistically significant having p-values of less than 0.05. Other benefits noted in Group-B as compared to Group-A patients were shorter hospital stay and less need of IV drips (Table-2,3). These results are similar to other studies across the globe. Brazilian prospective study of 308 patients showed rapid patient's recovery when similar protocol of less fasting was implemented.²³ Even when the gastrointestinal tract is not working, something may be absorbed. The psychological benefit may also be considered, because less fasting and early feeding can enhance the welfare of the patient and may help in the recovery process after surgery. Moreover cost of treatment is reduced as some drips are saved and hospital stay is reduced because patients with early oral intake tend to go home early.²⁴ Therefore implementation of this protocol can save Billions of rupees. Studies have shown that it is safe to conduct general anesthesia in patients who have ingested 150 ml of water 2 h prior to surgery. Prolonged withholding of oral fluid does not decrease gastric fluid volume and PH. The customary 6-8 hours fasting should be only followed for patients at high risk of aspiration like in diabetes mellitus, GERD etc. as more research is necessary to determine the safety in these patients. The risk of unexpected regurgitation cannot be avoided even by overnight fasting, and anesthesiologists must always be prepared to deal with such complications.²⁵

Majority of anesthesiologists advocate 6-4-2 rule of fasting for solids, milk/pulpy juice and clear fluid diet respectively for adults and 6-4-1 rule of fasting for solids, milk and clear fluid diet respectively for small children. In the practice of anesthesia, the presence & quantity of solid food and particulate matter in the stomach is more relevant for the risk of aspiration and not fluids. Reduction of preoperative fasting time also has many physiological benefits such as less lowering of blood pressure on induction and less risk of catabolic state particularly in small children.²⁶

CONCLUSION

Lesser fasting time allowing liquid diet until 2 hours before and after operation under GA/SAB brought numerous benefits to the patients. It was cost effective, reduced stress of operation and promoted early recovery after elective surgery with reduced complications in elective patients. Related Authorities, Hospitals, surgeons and anesthetists are recommended to adopt this new protocol to promote rapid recovery of surgical patients & to reduce overall cost of Health care.

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