Original Article

A prospective survey on knowledge, attitude and current practices of pre-operative fasting amongst anaesthesiologists: A nationwide survey

Address for correspondence:
Dr. Pratibha Panjiar, 16, Sadhna Enclave, Second Floor, New Delhi - 110 017, India.
E-mail: pratibha.panjiar@gmail.com

Pratibha Panjiar, Anjali Kochhar[1], Homay Vajifdar, Kharat Bhat

Department of Anaesthesiology and Critical Care, Hamdard Institute of Medical Sciences and Research, [1]Department of Anaesthesia and Critical Care, Vardhman Mahavir Medical College and Safdarjang Hospital, New Delhi, India

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ABSTRACT

Background and Aims: Pre-operative fasting is a routine practice to minimise the risk of pulmonary aspiration. The leading societies of anaesthesia have adopted more liberal fasting guidelines to avoid the adverse effect of prolonged fasting. This survey was conducted to assess the knowledge, attitude and current practice of fasting guidelines among Indian anaesthesiologists and to analyse the reasons for non-compliance of these guidelines. **Methods:** A questionnaire consisted of 11 questions was distributed via 'Survey Monkey' software to 621 anaesthesiologists who attended the annual conference of the Indian Society of Anaesthesiologists held in Ludhiana, in 2016. American Society of Anaesthesiologists (ASA) practice guidelines for fasting were the standard of assessment. **Results:** The response rate to the survey was 52%. Of the respondents, 69% described correctly the practice guidelines to pre-operative fasting. Only seven percent respondents were aware of the benefits of liberalised fasting. More than 2/3rd of the respondents advised fasting as per ASA guidelines during pre-anaesthetic check-up (PAC). However, only about 50% respondents confirmed that these guidelines are actually followed in their institution. Not having control on scheduling of cases in operation theatre and poor knowledge of ward nurses and surgeons were the common reasons for non-compliance of these guidelines. Twenty four percent respondents did not use routinely any drug for aspiration prophylaxis. **Conclusion:** Majority of the respondents were aware of the ASA fasting guidelines. However, the implementation of the guidelines and knowledge regarding benefits of liberalised fasting is poor among respondents.

Key words: Clear fluids, preoperative fasting, survey

INTRODUCTION

In 1946, the paper published by Mendelson claimed a very high incidence of pulmonary aspiration during general anaesthesia (GA) in obstetrics.[1] As a result, the traditional practice of NPO (Latin: Nulla per os; or nothing by mouth) after midnight before elective surgery was a routine clinical practice for many years.

Recently, various anaesthesia societies like the American Society of Anaesthesiologists (ASA), The Association of Anaesthetists of Great Britain and Ireland (AAGBI), Royal College of Nursing (RCN) revised practice guidelines for preoperative fasting in healthy patients undergoing elective procedures and recommended a fasting period of 2 hours for clear fluids, 4 hours for breast milk and 6 hours for light meal/formula milk (Liberalised fasting).[2-4]

These new, liberal fasting guidelines were based on studies showing that pulmonary aspiration occurs rarely as a complication of modern anaesthesia. The

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survey conducted by Shime N *et al*. revealed that there was no significant difference in the rate of pulmonary aspiration between the institutes that were applying the minimum period (4.8/100000) and institutes with longer fasting periods (9.1/100000).[5]

Prolonged preoperative fasting leads to increased patient anxiety, discomfort, thirst, hunger, and irritability in adults.[6,7] Children may develop dehydration, hypovolaemia and hypoglycaemia.[8] The advantages of liberalised fasting are clear but surveys done in other countries showed that despite fair knowledge of fasting guidelines, their implementation is poor.[9,10] The implementation of these guidelines in India has not yet been evaluated. We therefore conducted this survey to assess the knowledge, attitude and current practice of fasting guidelines among Indian anaesthesiologists. In addition, we also analysed the reasons for non-compliance of these guidelines.

METHODS

Following approval from the institutional ethical committee, this prospective, cross-sectional survey was conducted to obtain an insight into preoperative fasting routines. The questionnaire consisted of 18 questions and was developed after having reviewed previous national surveys.[5,9-11] Closed multiple-choice design for the questionnaire was selected to meet the criteria of objectivity and to exclude the possibility of interpretational errors. A panel of qualified anaesthesiologists reviewed the questionnaire, items were modified, and 14 questions were shortlisted by consensus. The document was then validated by seven experts using a standardised model of content validity index.[12] The questions with item content validity index <0.78 were not included in the final version of the questionnaire (n = 11). Scale content validity index (SCVI) was also calculated by SCVI universal agreement method (0.666) and SCVI average method (0.95). Values computed by both methods were within acceptable limits. The final version of the questionnaire [Appendix 1 is available online] was then tested in a small group of anaesthesiologists, twice at an interval of one month for checking reliability.

The questionnaire consisted of three sections. The first section was related to general information like practice setting of the respondents and years of experience in anaesthesia. The second section pertained to the anaesthesiologists' knowledge of the ASA published fasting guidelines and its importance. The third section was intended to gain information regarding current practices and attitude towards fasting guidelines.

The survey was distributed via the commercially available 'Survey Monkey' software (www.surveymonkey.com) to the 621 anaesthesiologists who attended the annual conference of the Indian Society of Anaesthesiologists held in Ludhiana, in November 2016. The email addresses of the anaesthesiologists attending the conference were manually collected (randomly) after explaining the purpose of the survey. Sharing of the email addresses by the anaesthesiologists implied their consent. After initial emailing, 10 subsequent reminders (twice every month for five months) were sent.

Considering 16,000 anaesthesiologists, the sample size was calculated to be 265 (5% margin of error and 95% confidence interval). ASA practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: Application to healthy patients undergoing elective procedures published in 1999 was the standard of assessment.[2] Statistical analysis was performed using Statistical package for Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). Data pertaining to respondent demographics, knowledge of fasting guidelines and its practice characteristics were collected and analysed descriptively using frequencies and percentages.

RESULTS

A total of 395 questionnaires were returned as shown in CONSORT diagram [Figure 1]. However, 127 questionnaires were excluded from the final analysis as they were partially filled. The response rate to the survey was 52% (268). The majority of the respondents (n-110, 41%) to our survey were from government teaching hospital and 87 (32%) were from private teaching hospital. Only 15 (6%) respondents were working in government non-teaching institute and 35 (13%) in private non-teaching institutes. Twenty-one (8%) respondents were working as free lancers. Of the 268 respondents, 100 (37%) had more than 10 years of experience, while 66 (25%) respondents had 5-10 years and 102 (38%) had 0-5 years of experience.

Of the respondents, 69% (185) described correctly the ASA published practice guidelines to preoperative fasting in non-laboring individuals (adult + paediatric)

undergoing elective procedures. The responses to the question (multiple choice) regarding benefits of allowing clear liquids 2 h before surgery were shown in Figure 2.

More than 2/3rd of the respondents (86.56%) reported that during pre-anaesthetic check-up, they advised 6-8 hours of fasting for solids and 70.14% respondents advised 2 hours of fasting for clear fluids in adults. However, only 51.86% and 40.67% respondents confirmed that 6-8hours of fasting for solids and 2 hours of fasting for clear fluids, respectively were actually followed in their institution [Figure 3].

The attitude of anaesthesiologists towards paediatric fasting guidelines are shown in Figure 4. During pre-anaesthetic check-up, 88% respondents advised 6-8 hours of fasting for solids, 83% advised 4-6 hours of fasting for breast milk/formula milk and 79% respondents advised 2 hours of fasting for clear fluids. However, 53% respondents confirmed that 6-8 hours of fasting for solids and 50% respondents confirmed that 4-6 hours of fasting for breast milk/formula milk and 2 hours of fasting for clear fluids were actually followed in their institution.

The barriers for not complying with the ASA guidelines are listed in Table 1. More than half of the respondents (55%) were of the opinion that not having control on scheduling of cases in operation theatre resulted in long fasting hours.

Attitude and practices of anaesthesiologists towards fasting guidelines is summarised in Table 2. Only 2% respondents confirmed that they always explained reasons for fasting to the patients. Most of the anaesthesiologists (83%, 93% and 76%) admitted that they would accept patients who took clear fluid 2 hours prior routine surgery for monitored anaesthesia care, regional anaesthesia and general anaesthesia, respectively. Twenty eight percent respondents confirmed that information about fasting a day before surgery was provided by nursing staff. Out of 268 respondents, only 24% confirmed that the drugs for aspiration prophylaxis were not routinely used in

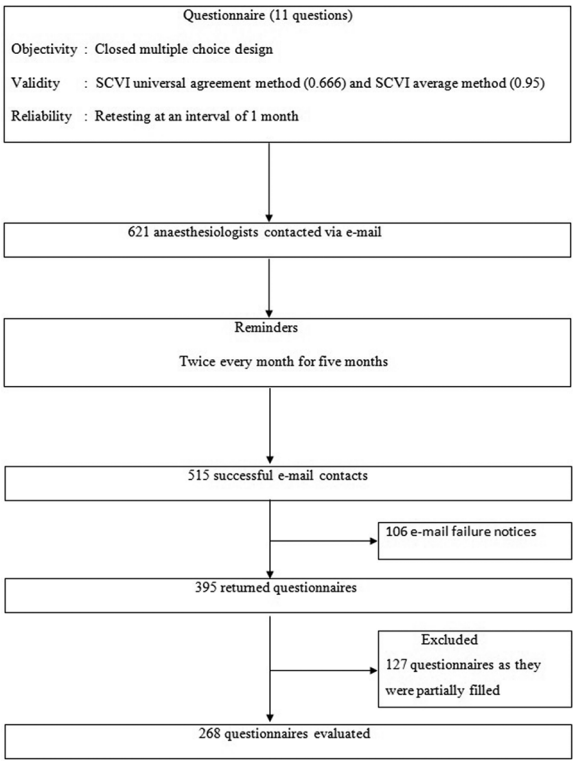

Figure 1: CONSORT flow diagram of survey study participants

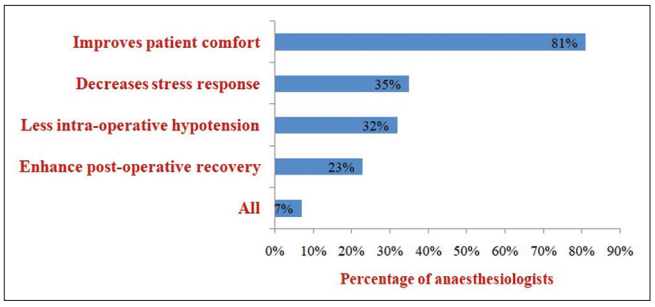

Figure 2: Knowledge of Anaesthesiologists regarding benefits of liberalised fasting

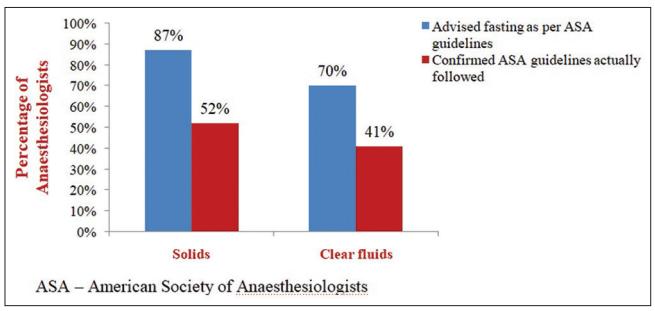

Figure 3: Anaesthesiologists attitude towards fasting guidelines in "Adults"

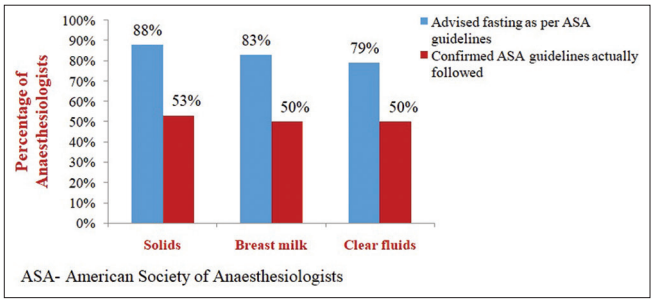

Figure 4: Anaesthesiologists attitude towards fasting guidelines in "Paediatrics"

their institution. Majority of respondents (23%) still use combination of ranitidine and metoclopramide for aspiration prophylaxis.

DISCUSSION

Pre-operative fasting is defined as a prescribed period of time before a procedure when patients are not allowed the oral intake of liquids or solids. The international preoperative fasting guidelines have been officially published by ASA in 1999 and revised recently in 2017.[13] However, the current study presents the first nationwide survey conducted in India to obtain an insight into the practice and attitude of anaesthesiologists regarding the preoperative fasting guidelines.

Table 1: The barriers for not complying with the fasting guidelines

Barriers	*n*	%
Fasting time according to guidelines inadequate for Indian patients	20	7.46
Hospital policy differs from guidelines	32	11.94
Not having control on scheduling of cases	147	54.85
Due to high workload in your institution	84	31.34
Poor knowledge of surgeons regarding importance of fasting guidelines	96	35.82
Ward nursing staff follow surgeons instructions than yours	105	39.17
You think patients will not understand instructions properly	52	19.4
You follow ASA fasting guidelines	56	21
Any other reason	0	0

ASA–American Society of Anaesthesiologists

The study showed that majority of the anaesthesiologists (69%) in India were aware of the ASA published practice guidelines to preoperative fasting in healthy patients undergoing elective procedures. Similar survey conducted in Sri Lanka by Gunawardhana showed that 70% of healthcare workers were aware of at least one of the recommended guidelines (ASA, Association of Anaesthetists of Great Britain and Ireland, Royal College of Nursing).[14]

The knowledge related to the advantages of liberalised fasting was poor among respondents. More than 2/3rd of all respondents answered that prolonged fasting results in discomfort of the patient. However, prolonged pre-operative fasting can result in dehydration, hypotension, hypovolaemia and electrolyte imbalance.[15,16] Moreover, it is associated with increase metabolic stress, hypoglycaemia and insulin resistance.[17,18] It was recently demonstrated that oral administration of carbohydrate-rich drink2-3 hours before surgery results in decreased protein catabolism, reduces preoperative thirst, hunger,

Table 2: Attitude and Practices of anaesthesiologists towards fasting guidelines

Question	Response		
	Frequency	*n*	%
Do you explain the reason for fasting to patients during PAC	Always	5	1.9
	Never	155	58
	Sometimes	108	40
Do you accept the patients who already took clear fluids 2 h prior routine surgery for anaesthesia	Technique	Yes *n* (%)	No *n* (%)
	Monitored Anaesthesia Care	222 (83)	45 (17)
	Regional Anaesthesia	249 (93)	18 (7)
	General Anaesthesia	203 (76)	64 (24)
Who informed the patients about fasting a day before surgery	Health care workers	n	%
	Anaesthesiologist	35	13
	Surgeon	18	7
	Nursing Staff	75	28
	Anaesthesiologist and Surgeon	19	7
	Anaesthesiologist and Nursing staff	21	8
	Surgeon and Nursing staff	16	6
	All	48	18
Drugs for aspiration prophylaxis routinely used in your institution	Drugs	n	%
	Drugs for aspiration prophylaxis are not routinely used	26	24
	Ranitidine	10	9
	Metaclopramide	4	4
	Ondansetron	11	10
	Ranitidine + Metaclopramide	25	23
	Ranitidine + Ondansetron	21	19
	Metaclopramide + Ondansetron	8	3
	Ranitidine + Metaclopramide + Ondansetron	10	9

anxiety and facilitates accelerated recovery through early return of bowel function and shorter hospital stay, ultimately leading to an improved pre-operative wellbeing.[19-21]

The study showed that during pre-anaesthetic check-up, majority of the anaesthesiologists advised fasting (for solids and clear fluids) as per ASA guidelines for both adult and paediatric patients. However the implementation of these guidelines in their institute is very poor. Our study revealed that only 50% of the anaesthesiologists confirmed that ASA guidelines for solids and clear fluids are actually followed in their hospital for paediatric patients. A survey conducted at Aga Khan University Hospital (Pakistan) found that only 4% of children had had the optimum fasting at the time of survey.[22] Moreover, an observational study, conducted at a tertiary care teaching institute in India, also found majority of the patients following prolonged fasting routines.[23]

According to the survey, the most common barrier for not complying with the fasting guidelines was not having control on scheduling of cases. However, the study conducted by Murphy *et al*. on the effects of liberalised preoperative fasting policy on operating room utilisation, found no increase in cancellations or delays of surgical procedures due to inappropriate oral intake.[24] Other barriers suggested by respondents in our survey were, ward nursing staff follow surgeon's instructions than anaesthesiologists, poor knowledge of surgeons regarding importance of fasting guidelines. An audit conducted by Arun *et al*. in tertiary care hospital concluded that education of ward nurses and better coordination among the anaesthesiologists, surgeons and nurses can greatly reduce unnecessary preoperative starvation in children.[25]

This study showed that 58% anaesthesiologists never explained the reasons for fasting to their patients. Poor understanding of the reason for fasting may lead to unintentional non-compliance.[26] Majority of the respondents in our survey accepted patients for anaesthesia in situation where patients had already taken clear fluids 2 hours before surgery for monitored anaesthesia care, regional anaesthesia and even for general anaesthesia. This shows that problem is with implementation rather than acceptance of these guidelines by anaesthesiologists.

Our study reveals that most of the time, information about fasting a day before surgery to the patients was provided by either a nurse or surgeon. This could also be the reason for non- compliance of the guidelines.

This study showed that only 24% respondents did not use any drug routinely for aspiration prophylaxis. A number of randomised controlled trials have shown that the preoperative fasting status has no impact on gastric pH and residual volume.[27] It has been shown that factors such as inadequate anaesthetic depth, patient positioning, insufficient airway protection, gastrointestinal pathology and emergency cases are much more associated with the risk of aspiration than the patient's fasting state.[28]

There were certain limitations of our study. Theresponse rate was not above 70%, therefore, non-response bias cannot be completely excluded. However, our response rate of 52% was comparable to those reported by the other national surveys conducted in Japan and Mexico.[5,29] Secondly, our data were based on subjective criteria; therefore, the value of the findings is less than that, using objective response criteria. Thirdly, it was not clear whether the survey respondents were representative of all the regions of India.

CONCLUSION

Our study showed that the majority of the respondents are aware of the ASA fasting guidelines. However, the implementation of these guidelines and knowledge regarding benefits of liberalised fasting is poor among respondents. The lack of control on scheduling cases in operation theatre and poor knowledge of nurses and surgeons are the common barriers for not complying with the guidelines. Therefore, comprehensive multi-professional educational programme to increase the awareness regarding fasting guidelines and its importance among ward nurses and surgeons is required to reduce the mean duration of fasting. Moreover, considering different Indian food habits, further research should be encouraged to design more specific fasting guidelines for Indian patients.

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Conflicts of interest
There are no conflicts of interest.

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APPENDIX 1

(QUESTIONNAIRE)

Q.1 Have you been working at:

a. Govt. teaching hospital b) Govt. non-teaching hospital
c. Private teaching hospital d) Private non-teaching hospital
e. Freelancing

Q.2 You are working as:

b. Trainee (<5 yrs exp.) b) Junior consultant (5-10 yrs exp.)
c. Senior consultant (>10yrs exp.)

Q.3 Describe the **ASA published** practice guidelines pertaining to preoperative fasting in non-laboring individuals undergoing elective procedures in each category:

	Adults	Children	Infants
Solids			
Breast milk			
Clear fluids			

Q.4 What are the benefits of allowing clear liquids2hrs before surgery:(multiple choice)

a. improves patient comfort
b. less intraoperative hypotension
c. decrease stress response
d. enhance post op recovery

Q.5 Please describe the preoperative fasting period you **advised to patients during PAC** in your institution in each category:-

	Adults	Children	Infants
Solids			
Breast milk			
Clear fluids			

Q.6 Please describe the **ACTUAL fasting period** which generally patients keep before surgery in your institution in each category:

	Adults	Children	Infants
Solids			
Breast milk			
Clear fluids			

Q.7 Describe reasons for not implementing guidelines (multiple choice):

a. You think that fasting time according to guidelines inadequate for Indian patients.
b. Hospital policy differs from guidelines.
c. Not having control on scheduling of cases.
d. Due to high workload in your institution.
e. Poor knowledge of surgeons regarding importance of fasting guidelines.
f. Ward nursing staff follow surgeons instructions than yours.
g. You think patients will not understand instructions properly.
h. You follow ASA guidelines
i. Any other reason, please mention_____

Q.8 Do you explain the reasonforfasting to patients during PAC:-

a) Always b) never c) sometimes

Q.9 Do you accept the patients who took clear liquids 2 hours prior routine surgery foranaesthesia:-

a. Monitored Anaesthesia Care Yes/No
b. Regional anaesthesia Yes/No
c. General Anaesthesia Yes/No

Q.10 Who informed the patient about fasting a day before surgery (multiple choice):-

a. Anaesthesiologist
b. Surgeon
c. Nursing staff
d. All of the above

Q.11 Aspiration prophylaxis drugs routinely use in your institution: (multiple choice)

a. Drugs for aspiration prophylaxis are not routinely used
b. Ranitidine
c. Metoclopramide
d. Ondansetron