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Research Article

Current knowledge, practice and attitude of preoperative fasting: A limited survey among Upper Egypt anesthetists

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KEYWORDS

Preoperative fasting;
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Abstract *Background:* Preoperative fasting aims at minimizing the risk of pulmonary aspiration. Anesthesia societies have officially recommended a fast of 2 h for clear fluids and 6 h for solid food before elective surgery.

We conducted a limited (regional) survey to examine anesthetists' preoperative fasting routines for adults undergoing elective surgery (primary endpoint). Further, we analyzed their familiarity with the new recommendations, knowledge of guidelines, and attitudes towards liberalized fasting (secondary endpoint).

Method: Standardized questionnaires were mailed to 147 anesthetists in South valley, Aswan, Qena and Sohag governorates requesting anonymous response. We focused on the duration of preoperative fasting for solids and fluids as well as on the anesthetists' knowledge and acceptance of new guidelines recommendations, and on their attitude towards this issue in general.

Results: The overall response rate was 68% (n = 101). Of those, 92 respondents were familiar with the new recommendations. A total of 18 (18.9%) anesthetists reported that they usually recommend a preoperative fast for solid food of 6 h and for clear fluids of 2 h (N group). A total of 10 (9.9%), of anesthetists respondents fell into (P group). The traditional NPO after midnight is still practiced by the majority 73 (72.27%) (T group).

Conclusion: Our study showed that the majority of studied anesthetists are aware of the new preoperative fasting guidelines; however, they are still practicing strict preoperative NPO from midnight. Therefore, National published guidelines are needed to promote shorter durations.

1. Introduction

Aiming at minimizing aspiration of gastric contents and its life threatening consequences, nil per os (NPO) order for clear fluid and solids overnight or 6–8 h preoperatively has been adopted by many anesthetists and surgeons [1]. This practice, however, does not take into consideration the differences in the rate of gastric emptying for clear liquids (1–2 h) and solid

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food (6 h). Moreover, traditional NPO practice does not take into account patients (at risk) of aspiration and patients who are not at risk [2].

Over the years, the practice of Nil per os (NPO) after midnight before elective surgery has been reconsidered [3]. Long preoperative fasting is linked to post-operative accelerated protein catabolism and increase insulin resistance as markers for stress reactions [4]. Nevertheless, extended preoperative fasting is not merely distressing for patients and their families [3,4], but also does not improve clinical outcomes [5,6]. Experimental studies and reviews have consistently shown the safety of clear liquid ingestion up to 2 h before induction of anesthesia in healthy patients without risk factors, and the fact that a longer fluid fast does not necessarily offer any added protection against pulmonary aspiration [1] Retrospective reports have shown that application of the liberalized guidelines for preoperative fasting and fluid intake has not resulted in increased pulmonary aspiration, morbidity or mortality. Instead it has resulted in decreased irritability, anxiety, comfort and peri-operative period is better tolerated [1]. The American Society of Anesthetists [7,8] and the Royal College of Anesthetist with other entities [9], have changed the official guidelines to recommend a fasting routine of 2 h for clear fluids and 6 h for solid food before elective surgery (liberalized fasting).

The implementation of these guidelines in Egypt has not yet been evaluated either on national or institutional level. We conducted a limited (institutional) survey to examine anesthetists's knowledge of preoperative fasting routines for adults undergoing elective surgery (primary endpoint). In addition, we analyzed their familiarity with the new recommendations, knowledge of guidelines, and the respondents' attitudes towards liberalized fasting (secondary endpoint).

2. Methods

The survey was jointly conducted by the department of anesthesia, Qena University Hospital, and the department of public health for quality reasons. After approval from the local ethics committee, a written questionnaire was sent to anesthetists in Upper Egypt (Aswan, Qena and Sohag governorates, between the periods May 2011 and May 2012. The anesthetists were identified thorough the local medical syndicate register. The original questionnaire [10], used by the national survey of German anesthesia departments and published in 2010, was adopted with permission and was used for our survey.

A code number was given to each set of questionnaires before sending out to potential respondents, whom have been informed that their response, data collection and publishing were strictly anonymous. In the questionnaire (Table 1), we paid attention to the anesthetists' knowledge of new guidelines recommendations as regard preoperative fasting routines, plus the respondents attitude towards implementing these new guidelines in general.

2.1. Statistical analysis

Data are reported as mean ± SD or frequencies (%). Chi-square test was utilized to compare these frequencies between the groups. *P*-value less than 0.05 was considered statistically significant. All tests were conducted in the area of exploratory data analysis. Therefore, no adjustments for multiple testing have been made Numerical calculations were performed with SPSS, Version 14, Copyright r SPSS Inc. (Chicago, IL).

3. Results

3.1. Response to survey

A total of 147 Upper Egypt anesthetists were randomly chosen for the survey. The questionnaire was completed correctly by 101 (68%), who were included in the final analysis.

3.2. Practice of preoperative fasting

We categorized anesthetists regarding the new preoperative fasting recommendation into three groups: (Table 2):

- New group (N): practice the new guideline recommendations.
- Partial group (P): practice a mixture of new guidelines and traditional NP.
- Traditional group (T): practice NPO after midnight.

A total of 18 (18.9%) anesthetists reported that they usually recommend a preoperative fasting for solid food of 6 h and for clear fluids of 2 h (N group). A total of 10 (9.9%), of anesthetists respondents fell into (P group). The traditional NPO after midnight is still practiced by the majority 73 (72.27%) (T group). Compared with hospital based patients, day care anesthetists recommended a fasting regimen according to the guidelines (N group) significantly more frequently (72.2% for fluids and 77.8% for solids), than hospital based anesthetists (27.8% for fluids and (22.2%) for solids). The majority of anesthetist 89 (88.1%) reported no clear policy when it comes to smoking, Table 3.

Commonest reasons reported for adopting new preoperative guidelines were, improved preoperative comfort ($n = 34$, 33.6%), increased patients satisfaction ($n = 42$, 41.6%), decrease peri-operative complication rates ($n = 28$, 27.7%), and improved post-operative well-being ($n = 19$, 18.8%).

The reasons against implementing new recommendations were: risk of pulmonary aspiration ($n = 72$, 71.3%), legal concerns ($n = 44$, 43.6%) and confusion within among the hospital staff ($n = 52$, 51.5%).

Regarding circumstances that compel respondents to adopt traditional NPO after midnight routines, the most frequent responses were generally for all patients (66%), 'bowel obstruction' (48%), 'incomplete bowel obstruction' (48%), and 'hiatus hernia/upper GI obstruction' (50%).

A majority of the (92%) respondents were familiar with the new recommendations. 'Journals' (88%), 'conferences and meetings' (43%), and 'communications with colleagues' (29%) were the most commonly reported sources of information.

4. Discussion

The current study presents the first preliminary available data for Upper Egypt governorates anesthetist's preoperative fasting policies since the publication of ASA guidelines on preoperative fasting in 1999 [8]. Although the first international preoperative fasting recommendations have been officially published by ASA in 1999 followed by the Royal College in

Table 1 Original questionnaire.

1. In which type of hospital or institution are you employed?
   a. University Medical Centre
   b. Hospital with > 1000 beds
   c. Hospital with 500–1000 beds
   d. Hospital with 250–500 beds
   e. Hospital with < 250 beds
   f. Day surgery
   g. I am a freelancing anesthetist
2. How many general anesthesia cases were performed in your institution in 2011?
   Please answer in absolute numbers: ...
3. Are you familiar with the British Royal College of Anesthetists guidelines for preoperative fasting?
   a. yes
   b. no (if no, stop the questionnaire at this point)
4. How did you learn about the above guidelines? (Multiple answers possible)
   a. Continuing education programs
   b. Journals
   c. Colleagues
   d. Internet
   e. Hospital's intranet
   f. Others
5. Before an elective procedure/operation, how long are ASA I &II patients allowed to:
   a. Eat
      Until midnight
      Until ... a.m.
      Until ... hours before the operation
      No definite standard
   b. Drink clear fluids
      Until midnight
      Until ... a.m.
      Until ... hours before the operation
      No definite standard
   c. Smoking
      Until midnight
      Until ... a.m.
      Until ... hours before the operation
      No definite standard
6. Under which circumstances do you keep the practice of NPO after midnight (Multiple answers are possible)
   a. Generally for all patients
   b. Patients with an ASA score of III or more
   c. Obese patients
   d. Patients with hernia or obstruction of the upper GI tract
   e. Diabetic patients
   f. Pregnant women
   g. Patients with an expected difficult airway
   h. Patients with a bowel obstruction
   i. Patients with an incomplete bowel obstruction
   j. Patients with a history of functional dyspepsia of reflux
   k. For no patients
   l. Other reasons .....
7. from your point of view: what are the advantages for implementing the new guidelines?
   a. None (if not a more than one answer can be given)
   b. Increased patient satisfaction
   c. Improved patient compliance
   d. Improved well-being before an operation (reduction of hunger, thirst, dry mouth, and anxiety)
   e. Improved sense of well-being after an operation (reduction of post-op nausea/vomiting and headache)
   f. Reduction of perioperative complication rates (dehydration, hypovolemia, hypoglycemia)
   g. Cost effectiveness (reduced hospital stay)
   h. Others

Table 1 *(continued)*

8. What are the obstacles against implementing the new recommendations?
   a. None (if not a more than one answer can be given)
   b. i.v. fluid administration can compensate for the fasting period
   c. Changing the hospital's routine could create confusion
   d. No advantages for patients
   e. Less flexibility for theatre management
   f. Higher risk of pulmonary aspiration
   g. Others

9. How many cases of aspiration under general anesthesia were documented in your institution in 2011?

10. Do your routinely give patients prophylaxis for aspiration?
   a. No routine prophylaxis if not a: (more than one answer can be given)
   b. Motility increasing agents
   c. Agents, which reduce the production of gastric acids (PPI, H2 blockers)
   d. Antacids agents (NaBi)
   e. Antiemetic agents (Droprodol, Ondasetron)
   f. Anticholinergic agents (Atropine, Scopolamin, Glycopyrolate)

11. General remarks on the subject of preoperative fasting:

NPO, nil per os; ASA, American Society of Anesthetists; GI, gastrointestinal.

Table 2 Categorization of preoperative fasting policies.

New
Clear fluids
2 h before induction of anesthesia
Solid food
6 h before induction of anesthesia
Partial
Clear fluids
>2 and <8 h or between midnight and 6 a.m.
Solid food
>6 and <8 h or between midnight and 2 a.m.
Traditional
Clear fluids
⩾8 h or from midnight or earlier
Solid food
⩾8 h or from midnight or earlier

New: Full application of the new guideline recommendations; Partial: practice of reduced preoperative fasting routine; Traditional: fasting from midnight or before midnight.

2005, the majority of anesthetists continue to practice a longer fasting period than recommended. Our study showed that the commonest reasons reported for adopting new preoperative guideline were, improved preoperative comfort ($n = 34$, 33.6%), increased patients satisfaction ($n = 42$, 41.6%), decrease peri-operative complication rates ($n = 28$, 27.7%), and improved post-operative well-being ($n = 19$, 18.8%). The reasons against implementing new recommendations were: risk of pulmonary aspiration ($n = 72$, 71.3%), legal concerns ($n = 44$, 43.6%) and confusion within among the hospital staff ($n = 52$, 51.5%).

Indeed, the existence of a good guideline and physicians' awareness of it does not guarantee consistent use. For example, a survey on the implementation of the International Liaison Committee on Resuscitation guidelines in German intensive care units revealed that only 24% reported adherence to guidelines [11]. Changing a common clinical practice is a complex process. To do so, one must not only deliver evidence-based recommendations, but also overcome numerous barriers [12]. Still, our data indicate a trend among studied anesthetists not to comply with liberalized fasting routines. This implies that national guidelines are needed to have a decisive impact on changing clinical practice.

Table 3 Reports of preoperative fasting practice.

	All ($n = 101$)	Hospital based ($n = 54$)	Day care based ($n = 47$)	*P*-value
Clear fluids				
New	18 (18.9%)	5 (27.8%)	13 (72.2%)	0.02
Partial	10 (9.9%)	4 (40%)	6 (60%)	0.2
Traditional	73 (72.27%)	47 (64.3%)	26 (35.6%)	0.003
Solid fluid				
New	18 (18.9%)	4 (22.2%)	14 (77.8%)	0.001
Partial	10 (9.9%)	4 (40%)	6 (60%)	0.3
Traditional	73 (72.27%)	52 (71.3%)	21 (28.8%)	0.004
Smoking				
Before midnight (⩾8 h)	12 (11.9%)	4 (33.4%)	8 (66.7%)	0.22
No clear policy	89 (88.1%)	40 (44.94%)	49 (55.01%)	0.32

Data in numbers (%); *P*-values for comparison between hospital vs. day care based anesthetists according to the chi-square test.

Our survey showed that, the majority of anesthetists in Upper Egypt governorates are aware of the current international preoperative fasting guidelines. However, the majority of respondents still follow a strict NPO after midnight. Moreover, the precise implementation of the up-dated preoperative guidelines is poor.

In Norway, Comparing the preoperative fasting practice before and after the first national published guidelines, it was found that 69% of the Norwegian hospitals have changed its preoperative fasting practice after the publication of new national guidelines [13] Furthermore, a survey conducted on American hospitals and ambulatory anesthetists revealed that a 2-h fast for clear fluids was explicitly allowed by only 25% of the respondents [14]. Later, once the American Society of Anesthesiologists (ASA) published their guidelines on preoperative fasting, there was dramatic change in the preoperative fasting routine in the United States [8]. According to Pandit et al., 62% of the respondents reported institutional policies allowing clear fluids up to 2–3 h before anesthesia [15].

Additionally, a recent Japanese survey showed that 90% of teaching hospital anesthetists still did not allow patients to ingest clear fluids up to 2 h preoperatively [16]. Hence, the lack of official Japanese recommendations at the time of the survey may explain this reluctance and underscore a certain need for national guidelines to implement evidence-based practice.

The lack of flexibility in operative room management, the flow of everyday duties, legal concerns among anesthetists and 'confusion within the institution', are possible barriers to implementation of the new fasting guidelines. Our study shows statistically significant difference between hospital based anesthetists who reported more Traditional NPO policy than day-care of free lancer based anesthetists. This might be explained by the possible role of the institution e.g., hospital, with its managerial policies that might challenge the application of new guidelines.

Murphy et al., prospectively analyzed the effects of liberalized preoperative fasting policy on operating room utilization and found no increase in cancellations or delays of surgical procedures due to inappropriate oral intake [17].

Further, aspiration is still major concern among anesthetists and a main barrier to implement the new international guidelines. The reported over all incidence of aspiration between strict overnight fasting and new guidelines patient are similar [18–21], and a number of randomized controlled trials, have shown that the preoperative fasting status has no impact on gastric pH and residual [22]. In contrast, it has been shown that factors such as inadequate anesthetic depth, insufficient airway protection, and emergency cases are much more relevant for the risk of aspiration than the patient's fasting state [23].

One limitation of our study, it relied on subjective criteria (the response of the studied group of anesthetists to the questionnaire), therefore, the value of the results is less than utilizing objective response criteria. This has particular importance when probe down the reasons for not applying or applying the new guidelines in our institutions. The data collected relied mainly on memory or files search that their accuracy and completeness will be different for each hospital. Furthermore, we did not define important aspects of the questionnaire, most importantly, the definition of aspiration. Nevertheless, the new recommendations about fasting are merely for elective surgery, the reports we used included all operation not only for elective surgery. Last, our response rate was not above 70%, therefore, we can't exclude non-response bias. However, our response (68%) is comparable with other surveys from other countries [24].

5. Conclusion

To conclude our study showed that the majority of the studied anesthetists are aware of the new guidelines regarding preoperative fasting routines; however, anesthetists are practicing strict preoperative NPO from midnight to both fluid and solid. Concerns regarding patient safety and everyday work flow might explain the adherence to the traditional fasting policies. Therefore, National published survey and guidelines are needed to promote shorter durations of preoperative fasting as one key aspect to improve peri-operative care.

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References

[1] Scarlet M, Crawford-Sykes A, Nelson M. Preoperative starvation and pulmonary aspiration: new perspectives and guidelines. West Indian Med J 2002;51(4):241–5.
[2] Weiss G, Jacob M. Preoperative fasting 2008: medical behavior between empiricism and science. Anesthetist 2008;57(9):857–72.
[3] Soreide E, Eriksson LI, Hirlekar G, Eriksson H, Henneberg SW, Sandin R, Raeder J. Pre-operative fasting guidelines: an update. Acta Anaesthesiol Scand 2005;49:1041–7.
[4] Soop M, Nygren J, Thorell A, Ljungqvist O. Stress-induced insulin resistance. recent developments. Curr Opin Clin Nutr Metab Care 2007;10:181–6.
[5] Bopp C, Hofer S, Klein A, Weigand MA, Martin E, Gust R. A liberal preoperative fasting regimen improves patient comfort and satisfaction with anesthesia care in day-stay minor surgery. Minerva Anesthesiol 2009;75:1–7.
[6] Agarwal A, Chari P, Singh H. Fluid deprivation before operation: the effect of a small drink. Anaesthesia 1989;44:632–4.
[7] Yuill KA, Richardson RA, Davidson HIM, Garden OJ, Parks RW. The administration of an oral carbohydrate-containing fluid prior to major elective upper-gastrointestinal surgery preserves skeletal muscle mass postoperatively – a randomised clinical trial. Clin Nutr 2005;24:32–7.
[8] American Society of Anesthesiologists Task Force on Preoperative Fasting. 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. Anesthesiology 1999;90:896–905.
[9] An RCN guideline for the multidisciplinary team, full version, November 2005. Clinical practice guidelines, perioperative fasting in adults and children. 20 Cavendish Square, London, W1G 0RN: The Royal College of Nursing; November 2005. p. 21–32 [ISBN: 1-904114-20-2. Publication code: 002 800].
[10] Breuer J-P-, Bosse G, Seifert S, Prochnow L, Martin J, Schleppers A, Geldener G, Soreide E, Spies C. Pre-operative fasting: a nationwide survey of German anaesthesia departments. Acta Anaesthesiol Scand 2010;54:313–20.
[11] Wolfrum S, Radke PW, Pischon T, Willich SN, Schunkert H, Kurowski V. Mild therapeutic hypothermia after cardiac arrest – a nationwide survey on the implementation of the ILCOR guidelines in German intensive care units. Resuscitation 2007;72:207–13.

[12] Bosse G, Breuer JP, Spies C. The resistance to changing guidelines – what are the challenges and how to meet them. Best Pract Res Clin Anaesthesiol 2006;20:379–95.
[13] Fasting S, Soreide E, Raeder JC. Changing preoperative fasting policies: impact of a national consensus. Acta Anaesthesiol Scand 1998;42:1188–91.
[14] Green CR, Pandit SK, Schork MA. Preoperative fasting time: is the traditional policy changing? Results of a national survey. Anesth Analg 1996;83:123–8.
[15] Pandit SK, Loberg KW, Pandit UA. Toast and tea before elective surgery? A national survey on current practice. Anesth Analg 2000;90:1348–51.
[16] Shime N, Ono A, Chihara E, Tanaka Y. Current practice of preoperative fasting: a nationwide survey in Japanese anesthesia-teaching hospitals. J Anesth 2005;19:187–92.
[17] Murphy GS, Ault ML, Wong HY, Szokol JW. The effect of a new NPO policy on operating room utilizations. J Clin Anesth 2000;12:48–51.
[18] Fasting S, Gisvold SE. Serious intraoperative problems – a five-year review of 83,844 anesthetics. Can J Anaesth 2002;49:545–53.
[19] Mellin-Olsen J, Fasting S, Gisvold SE. Routine preoperative gastric emptying is seldom indicated: a study of 85,594anaesthetics with special focus on aspiration pneumonia. Acta Anaesthesiol Scand 1996;40:1184–8.
[20] Warner MA, Warner ME, Weber JG. Clinical significance of pulmonary aspiration during the perioperative period. Anesthesiology 1993;78:56–62.
[21] Olsson GL, Hallen B, Hambraeus-Jonzon K. Aspiration during anaesthesia: a computer-aided study of 185358 anaesthetics. Acta Anaesthesiol Scand 1986;30:84–92.
[22] Brady M, Kinn S, Stuart P. Preoperative fasting for adults to prevent preoperative complications. Cochrane Database Syst Rev 2003:CD004423.
[23] Kluger MT, Short TG. Aspiration during anaesthesia: a review of 133 cases from the Australian Anaesthetic Incident Monitoring Study (AIMS). Anaesthesia 1999;54:19–26.
[24] McGaw CD, Ehikhametalor E, Nelson M, Soogrim D. A national survey on preoperative fasting policies and practices in Jamaican hospitals. West Indian Med J 2004;53:227–33.