ACID ASPIRATION PROPHYLAXIS DURING ANAESTHESIA FOR CAESAREAN SECTION: A SURVEY AMONG ANAESTHETISTS AT HYDERABAD

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Background: Pulmonary aspiration of gastric contents leading to acid aspiration syndrome (AAS) is a well recognized risk factor during general anaesthesia (GA) for Caesarean section (CS). The cross sectional observational study was conducted during July 2008 to October 2008 at Department of Anaesthesiology and Intensive Care, Liaquat University of Medical & Health Sciences Jamshoro, Sindh, Pakistan. The objective was to assess anaesthetic practice patterns and measures to prevent aspiration of acid gastric contents in full term pregnant women undergoing anaesthesia for Caesarean section. **Methods:** A structured questionnaire regarding practice of anaesthesia for Caesarean section was distributed among anaesthetists working and practicing at Hyderabad. Results from the completed questionnaires were transferred to a Microsoft Excel spreadsheet and the responses represented as percentages. **Results:** General anaesthesia was preferred by 75.4% anaesthetists for caesarean section, 83.6% anaesthetists used rapid sequence induction with cricoid pressure during general anaesthesia, 29.5% respondents restricted clear fluids for 2–3 hours. Antacids were used by 90% of the anaesthetists, while about 50% anaesthetists performed extubation when patients were fully awake. **Conclusion:** Recommended practice patterns and measures to prevent aspiration of acid gastric contents during anaesthesia for caesarean section are not observed by most of the anaesthetists working at Hyderabad.

Keywords: Caesarean Section, Anaesthesia, Acid Aspiration Prophylaxis

INTRODUCTION

Pulmonary aspiration of gastric contents leading to Acid Aspiration Syndrome (AAS) is a well recognised risk factor during general anaesthesia (GA) for Caesarean section (CS).[1–3] Several studies indicate that peri-operative aspiration is associated with significant morbidity in obstetric patients.[4] It was even attributed as a cause of death by Sir James Simpson.[5] The risk of aspiration in these patients is present throughout peri-operative period, especially during induction and emergence from general anaesthesia.[3,6] Prophylactic measures should therefore provide protection during induction as well as emergence from general anaesthesia.

As AAS occurs mainly during general anaesthesia, regional techniques are the most effective prophylactic measure in healthy full term pregnant ladies.[7,8] However, general anaesthesia is still necessary for the management of many situations including refusal of the patient for regional technique,[2] coagulopathy, maternal haemorrhage, life-threatening foetal compromise and failure of spinal block.[9,10] Numerous measures and manoeuvres are used to prevent aspiration of acid gastric contents during general anaesthesia. These include pre-operative fasting, non-particulate antacids, H_2 receptor blockers, gastrokinetic drugs like metoclopramide, rapid-sequence induction with cricoid pressure and awake extubation during emergence from general anesthesia.[3]

We conducted a survey among anaesthetists at Hyderabad to assess routine practice patterns and measures to prevent acid aspiration syndrome during anaesthesia for Caesarean section.

MATERIAL AND METHODS

A structured questionnaire asking questions in relation to practice of anaesthesia for CS and prevention of AAS was distributed among 58 anaesthetists attending a symposium at Hyderabad. The questionnaire was sent to 30 more practicing anaesthetists who did not attend the symposium. Replies were received from 61 anaesthetists.

Results from the completed questionnaires were transferred to Microsoft Excel spreadsheet and the responses represented as percentages.

RESULTS

Questionnaires were distributed among 88 anaesthetists practicing at Hyderabad in public as well as private sector hospitals. Sixty-one completely filled questionnaires were received back. Demographic data of the responding anaesthetists is given in Table-1. The attitudes and practice patterns of anaesthetists for Prophylaxis of AAS are given in Table-2.

Table-1: Demographic data of the Respondents

Anaesthetists	Number	%
Total Number of Responding Anaesthetists	61	100
Qualified Anaesthetists	17	27.9
Non-Qualified Anaesthetists	44	72.1
Time practicing anaesthesia:		
<5 years	15	24.6
5–10 years	23	37.7
>10 years	23	37.7
Anaesthetists working at:		
Public Sector Hospitals	8	13.1
Private Sector Hospitals	12	19.7
Public and Private Sector Hospitals	41	67.2

Table-2: Attitudes of anaesthetists for prophylaxis of AAS

Question	Response	
	Number	%
Preferred Anaesthesia Technique		
Regional Anaesthesia (RA)	15	24.6
General Anaesthesia (GA)	46	75.4
Induction Technique for GA		
Routine	7	11.5
RSI	54	88.5
Cricoid Pressure applied:		
Yes	10	16.4
No	51	83.6
Restriction for clear fluids		
2–3 hours	18	29.5
6–8 hours	43	70.5
Restriction for solids		
2–3 hours	0	0
6–8 hours	61	100
Antacids*		
Yes	55	90.2
No	6	9.8
Extubation		
Deep	30	49.2
Awake	31	50.8

*H_2 Blockers/Metoclopramide

DISCUSSION

Pulmonary aspiration of gastric contents during anaesthesia, resulting in acid aspiration syndrome, is one of the major causes of maternal morbidity and mortality.[3] Therefore prophylaxis of AAS should be considered a routine procedure in obstetric anaesthesia patients presenting for Caesarean section.

The first and foremost measure to prevent AAS is to choose regional instead of general anaesthesia (GA) for CS whenever possible, because pulmonary aspiration of gastric contents remains a clear risk during induction of GA.[11] Regional anaesthesia has become more popular and widely practiced anaesthesia technique to prevent AAS and other maternal complications of general anesthesia.[12,13] Our survey showed that in Hyderabad, more than 75% of practicing anaesthetists preferred GA for CS.

The damage produced by aspiration of gastric contents depends upon the volume and pH of the fluid that enters the lungs. Larger volumes of acidic aspirate lead to a more severe pneumonitis than smaller volumes of pH- neutral fluid.[3] It is recommended to administer non-particulate antacids, H_2 receptor antagonists, and/or metoclopramide for aspiration prophylaxis.[14] In UK, pharmacological prophylaxis to prevent AAS is given in more than 90% of scheduled CS patients.[15] In a survey conduced in Slovakia, 66% departments administered acid aspiration prophylaxis routinely before CS.[16] In our survey, authors noticed that 90% of anaesthetists used acid aspiration prophylaxis by H_2 blockers and metoclopramide.

The patients scheduled for elective CS should undergo a fasting period of 6–8 hours for semi-solids/solids and may take moderate amounts of water and other clear liquids up to 2 h before induction of anaesthesia. Many studies have shown that residual gastric volume is decreased when the fasting interval for fluids is reduced.[17] Analyses of aspiration incidents have not identified recent preoperative oral fluid ingestion as a risk factor.[18,19] In the absence of pain or opioid intake, women in the third trimester of pregnancy do not have delayed gastric emptying.[20,21] Indeed, gastric emptying, measured by both acetaminophen absorption and ultrasound, was faster in pregnant women at term after ingestion of 300 ml of water as compared to 50 ml of water.[22] In this survey it was observed that all the anaesthetists agreed on and practiced 6–8 hour restriction of solids before induction of anaesthesia, while regarding clear fluids, contrary to the recent recommendations, 70% of the participants were of the view that clear fluids should also be restricted for 6–8 hours rather than 2–3 hours.

The risk of aspiration in full term pregnant patients is present throughout the perioperative period, especially during induction and emergence from anaesthesia. Rapid sequence induction, instead of routine induction, is believed to minimize this risk and is widely used during GA for CS. In a typical rapid sequence induction, an assistant applies cricoid pressure before the induction of anaesthesia, and pressure is maintained until endotracheal tube has been placed within the trachea, the cuff is inflated and position of the endotracheal tube in trachea is confirmed.[23] At the termination of surgery, patients are extubated when they are fully awake and perform purposeful movements or respond to vocal commands, thus ensuring that they can protect the airway on removal of the endotracheal tube.[2] During general anaesthesia, only 16.5% anaesthetists participating in this survey used rapid sequence induction with cricoid pressure. For extubation, awake technique was employed by only 50% of anaesthetists.

This survey reveals many differences in the attitudes and practice patterns during anaesthesia for

CS among anaesthetists at Hyderabad. It is observed in this study that standard steps and measures recommended to minimize the chances of AAS are not followed by all anaesthetists. A standard approach is likely to lead to decrease the complications and improve the outcome. This suggests that majority of anaesthetists at Hyderabad do not follow the best practice patterns to decrease acid aspiration syndrome.

CONCLUSION

Prophylaxis of AAS should be considered a routine procedure in full term pregnant patients undergoing Caesarean section. To achieve this goal, regular education and awareness among anaesthetists practicing obstetric anaesthesia is recommended.

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