Symposium Report

The stomach: factors of importance to the anaesthetist

Participants

J.M. Davies MSc MD FRCP (Chairman)
Department of Anaesthesia, Foothills Hospital at the University of Calgary, Calgary, Alberta

Joseph S. Davison PhD
Department of Medical Physiology, University of Calgary, Calgary, Alberta T2N 4N1
(Applied physiology of gastrointestinal functions)

Walter S. Nimmo MD FRCP FFARCS FFARACS
Inveresk Clinical Research, Edinburgh EH14 4AP, Scotland.
(Pharmacology of agents that affect gastric secretion, emptying and vomiting)

Jean-François Hardy MD FRCP
Department of Anaesthesia, Institut de Cardiologie de Montréal, Université de Montréal, 5000 est Belanger, Montréal, Québec H1T 1C8
(Regurgitation and aspiration in the non-pregnant patient: pathophysiology, incidence, and prophylaxis)

Geraldine O’Sullivan MD FFARCS
Department of Anaesthesiology, St. Thomas’ Hospital, London SE1 7EH England
(Regurgitation and aspiration in the pregnant patient: pathophysiology, incidence, and prophylaxis)

J.R. Maltby MB BChir FFARCS FFARCS
Department of Anaesthesia, Foothills Hospital at the University of Calgary, Calgary, Alberta.
(The shortened fluid fast and the Canadian Anaesthetists’ Society's new guidelines for fasting in elective/emergency patients)

Overview

The title of the Ninth Annual Anaesthetic Symposium of the Department of Anaesthesia, Foothills Hospital at the University of Calgary was “The Stomach: Factors of Importance to the Anaesthetist.” The purpose of the symposium was to review the latest in gastric physiology and pharmacology, i.e., regurgitation, vomiting, and pulmonary aspiration of gastric contents. In addition, the latest guidelines to the preoperative fasting were discussed.

Dr. Joe Davison discussed the physiology of the stomach, describing how gastric secretion and downward and upward emptying occur. He emphasized that advances in the understanding of the basic processes have led to the development of specific therapy. For example, gastric secretion is under the control of gastrin, acetylcholine, and histamine, with the latter as the final common denominator. Dr. Walter Nimmo followed with a description of current and soon-to-be-introduced drug for the treatment of problems of gastric secretion and emptying, and nausea and vomiting. He also introduced a literary note to the symposium by describing how delay in gastric emptying due to the effect of opioids had been used by Agatha Christie in the 1920’s as a plot device in “The Mysterious Affairs at Styles.” Dr. Jean-François Hardy reviewed the problem of regurgitation and aspiration in the pregnant patient. He then defined the factors which place a patient at risk of these pulmonary complications. These factors include the composition of gastric fluid and bile, the force of retrograde profusion, degree of incompetence of the lower oesophageal sphincter, and the volume of liquid (sufficient to inundate the lungs). Dr. Geraldine O’Sullivan reviewed these problems in the pregnant patient. She also outlined trends in the incidence of maternal mortality associated with anaesthesia: although the absolute numbers of deaths has decreased, the proportion of those dying from difficulties with tracheal intubation has increased. Finally, Dr. Roger Maltby described the rationale for the past, present, and future guidelines for preoperative oral intake. He noted that fasting has no effect on either lower oesophageal tone (rarely a cause of problems) or protective upper airway reflexes (commonly abolished by the use of the tracheal tubes, muscle relaxants, and deep anaesthesia). In conclusion, all speakers emphasized the importance of identifying patients at risk of complications.

Le thème du 9ème Symposium Annuel d’Anesthésie du
Symposium Report

Department of Anesthesiology of University of Calgary was "The stomach: Important factors for the anesthesiologist." The purpose of this Symposium was to review the latest data of physiology and pharmacology of gastrophysiology, i.e., regurgitation, vomiting, and pulmonary aspiration of gastric contents. 

In addition, the latest guidelines for preoperative fasting were discussed.

Doctor Joe Davison discussed the physiology of the stomach, explaining the secretion of gastrin as well as normal and abnormal gastric emptying. He highlighted the new knowledge regarding the basic processes that led to the development of specific therapies. For example, gastric secretion, which is under the control of gastrin, acetylcholine, and histamine, is the common denominator.

Doctor Walter Nimmo followed with a description of the currently available and those that will be soon for the treatment of secretion and gastric emptying, nausea, and vomiting. He also added a literary note to this Symposium by describing how the delay of stomach emptying due to the effects of opioids was utilized by Agatha Christie in 1920 as a clue of mystery in her book "The Mysterious Affairs at Styles." 

Doctor Jean-Francois Hardy reviewed the problem of regurgitation and aspiration in non-pregnant patients. He also defined the factors that expose the patient to the risk of gastrointestinal complications. These factors include the composition of gastric fluid and bile, the force of the retrograde jet, the degree of incompetence of the lower esophageal sphincter, and the volume of fluid (sufficient to flood the lungs).

Doctor Geraldine O'Sullivan reviewed these problems in pregnant patients. She also reviewed the trends in maternal mortality associated with anesthesia. Even if the number of deaths has decreased, the proportion of those who died from difficult intubation has increased.

Finally, Doctor Roger Maltby described the logic behind the guidelines passed, present, and future concerning the fast-preoperative. He noted that the preoperative fast had no effect on the tonus of the lower esophageal sphincter (rarely due to cause of problems) or the reflexes of protection of the afferent nerves. The relaxants muscles and anesthesia profoundly. In conclusion, all the speakers emphasized the importance of identifying patients at risk of complications.

Acknowledgements

I gratefully acknowledge Sharon Hodgkinson for her help in preparation of the summaries; Jocelyn Lockyer and her staff at Continuing Medical Education, Faculty of Medicine, University of Calgary for organizational help; and Anaquest, Arrow, Burroughs Wellcome, Cook (Canada) Inc., Graphic Controls, and Janssen Pharmaceuticals for generous grants in aid of Continuing Medical Education.

Applied physiology of gastrointestinal functions

The gastrointestinal tract can be a major factor in contributing to morbidity and even mortality after anesthesia. These complications may be due to the anesthetic or interactions between the anesthetic and other factors such as drugs administered pre- and postoperatively, the effects of surgery, or the physiological state of the patient. Some, but not all, of the complications of gastrointestinal origin can be fully explained by current knowledge of gastrointestinal physiology and pharmacology. In other cases, basic physiological principles can point the way to further studies.

Regurgitation and vomiting

Pulmonary aspiration of gastric contents is a major potential hazard of anesthesia. In obstetrics, anesthesia is a leading cause of maternal mortality, with aspiration of gastric fluids the most common cause of anesthesia-related maternal death. The pregnant patient is particularly vulnerable to aspiration for several reasons which all contribute to an increased susceptibility to regurgitation. These include: lowered barrier to gastric reflux because of reduced lower oesophageal sphincter tone; delayed gastric emptying, at least in those patients with heartburn; and augmented gastric secretion, possibly due to increased circulating gastrin concentrations.

During labour, additional factors potentiate the tendency to regurgitation. Gastric emptying is delayed in the later stages of labour, possibly because of pain and stress. Use of drugs such as opioids and sedatives further retards gastric emptying in many, if not in all cases, through action on the enteric system. In addition, gastric secretion is increased because of starvation ketosis.

While problems of regurgitation and subsequent aspiration in pregnancy are mainly attributable to motility