Section: Anaesthesiology

Original Research Article

EVALUATION OF PERI-OPERATIVE ADVERSE EVENTS RELATED TO ANAESTHESIA DURING IN-PATIENT AND OUTPATIENT PROCEDURES AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Patient safety is the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum. One of the outcomes frequently analysed in studies addressing this theme is the occurrence of adverse events. This study was conducted to assess anaesthesia related peri-operative adverse events.

Materials and Methods: This study comprised of 100 anaesthetic procedures in all. The subjects had been asked for consent. The adverse events were noticed. Statistical analysis had been conducted using SPSS software.

Results: The most common adverse event was perioperative cardiac arrest observed in 29 subjects, followed by unexpected difficult airway seen in 16 subjects. Perioperative pulmonary aspiration was noticed 10 subjects. Stroke/coma was seen in 9 subjects and malignant hyperthermia was seen in 3 subjects. Total 67 complications had been observed.

Conclusion: The most common perioperative complication was cardiac arrest followed by unexpected difficult airway. Other complications were pulmonary aspiration, stroke or coma, and malignant hyperthermia.

Keywords: Anaesthesia, Complications, Cardiac Arrest.

INTRODUCTION

According to the World Health Organization (WHO) international classification,[1] patient safety is the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum. One of the outcomes frequently analyzed in studies addressing this theme is the occurrence of adverse events. According to the terminology created by the WHO World Patient Safety Alliance, an adverse event is harm to a patient that was associated with healthcare, or, more precisely, it is the injury incident, classified as the event or circumstance that could have resulted, or, resulted in unnecessary harm to a patient.

A study performed in Spain (Ibeas), which assessed the prevalence of adverse events occurring in hospital settings of various institutions in five Latin American countries, defined adverse event as “an event that caused harm to a patient and was more associated with healthcare than with the patient’s underlying disease”.[2]

The literature on anesthesia-related adverse events shows a tendency towards a reduction in the occurrence of complications associated with anesthesia and a decrease in perioperative mortality. A systematic review assessing perioperative mortality in patients undergoing general anesthesia has shown a reduction in the risk of perioperative mortality and anesthesia-related mortality in the last 50 years, particularly in developed countries,[3] corroborated by other more recent studies, including one performed in Brazil.[4,5]

Studies assessing mortality during anesthesia are relatively more common in the literature than studies assessing the incidence of different types of complications, such as the occurrence of cardiac arrest, both nationally and internationally.[6] This

study was conducted to evaluate peri-operative adverse events related to anaesthesia during in-patient and outpatient procedures.

MATERIAL AND METHODS

This study comprised of 100 anaesthetic procedures in all. The subjects had been asked for consent. The subjects who were willing to consent had been included in the study while others who were not interested in participating in the study or giving consent had been excluded from the study. The adverse events had been noticed. Statistical analysis had been conducted using SPSS software.

RESULTS

The most common adverse event was perioperative cardiac arrest observed in 29 subjects, followed by unexpected difficult airway seen in 16 subjects. Perioperative pulmonary aspiration was noticed 10 subjects. Stroke/coma was seen in 9 subjects and malignant hyperthermia was seen in 3 subjects. Total 67 complications had been observed

Table 1: Complications following anaesthesia

Complications	Number of cases	Percentage
Perioperative cardiac arrest	29	29%
Unexpected difficult airway	16	16%
Perioperative pulmonary aspiration	10	10%
Stroke/coma	09	09%
Malignant hyperthermia	03	03%
Total	67	67%

DISCUSSION

It has been estimated that in 2010 almost a third of all deaths worldwide were caused by conditions requiring surgical care,[7] surpassing deaths from human immunodeficiency virus (HIV), tuberculosis and malaria combined.[8] A report by The Lancet Commission on Global Surgery published in 2015 highlighted the need for universal access to safe, affordable surgical and anaesthetic care.[9]

Perioperative mortality has been used as an indicator of surgical and anaesthetic safety,[10] although perioperative mortality has declined over the past 50 years, low and middle income countries (LMICs) have a two to four fold increased risk of perioperative mortality.[11] Surgical patients in Africa have significantly increased mortality despite having a lower risk profile and undergoing less-complex surgeries.[12] Anaesthesia related mortality in sub-Saharan African countries is higher than in high income countries,[13-15] with improvements in anaesthesia services described as a priority in global health.[16]

The variability of conditions in which anaesthesia is provided in LMICs is vast; the training background of anesthetic providers can differ, with shortages of physician anaesthesia providers; the World Federation of Societies of Anaesthesiologists workforce survey found a 90-fold difference between the average physician anaesthesia provider workforce density in high income countries (HICs) when compared to low-income countries.[17] This study was conducted to assess anaesthesia related peri-operative adverse events.

In this study, the most common adverse event was perioperative cardiac arrest observed in 29 subjects, followed by unexpected difficult airway seen in 16 subjects. Perioperative pulmonary aspiration was noticed 10 subjects. Stroke/coma was seen in 9 subjects and malignant hyperthermia was seen in 3 subjects. Total 67 complications had been observed. Fecho K et al (2008),[18] determined the one-year incidence of, and risk factors for, perioperative adverse events during in-patient and out-patient anesthesia-assisted procedures. A quality assurance database was the primary data source. Outcome variables were death and the occurrence of any adverse event. Risk factors were ASA physical status (PS), age, duration and type of anesthesia care, number of operating rooms running, concurrency level and medical staff. Data were stratified by in-patient or out-patient, surgical (e.g. thoracotomy) or non-surgical (e.g. electroconvulsive therapy), and were analyzed using Chi square, Fisher's exact test and generalized estimating equations. Of 27,970 procedures, 49.8 percent were out-patient and greater than 80 percent were surgical. For surgical procedures, adverse event rates were higher for in-patient than out-patient procedures (2.11 percent vs. 1.45 percent; $p < 0.001$). For non-surgical procedures, adverse event rates were similar for in-patients and out-patients (0.54 percent vs. 0.36 percent). The types of adverse events differed for in-patient and out-patient surgical procedures ($p < 0.001$), but not for non-surgical procedures. ASA PS, age, duration of anesthesia care, anesthesia type and medical staff assigned to the case were each associated with adverse event rates, but the association depended on the type of procedure. In-patient and out-patient surgical procedures differ in the incidence of perioperative adverse events, and in risk factors, suggesting a need to develop separate monitoring strategies. Burgess A et al (2011),[19] in this prospective observational study which was carried out over six-weeks in March to April 2019 in an Ethiopian tertiary referral hospital, included direct observations in the operating room and recording of any anaesthesia-related adverse events occurring during the perioperative period. Fifty surgical cases

were observed during weekday daytime hours. Sixteen anaesthesia-related adverse events were observed in 12 patients, including six elective cases and six emergencies, an adverse event rate of 32% (n=16), affecting 24% (n=12) of patients. Most incidents occurred in infants less than one-year-old and those between 11-20 years (31.3%; n=5 each) and those undergoing general anaesthesia (66.7%; n=8), particularly during the induction phase (50%; n=8), the most common event being prolonged desaturation (31.3%; n=5). Most events were considered to contribute a low level of harm (56.3%; n=9). There were no intra-operative mortalities. This study presents evidence of a higher rate of adverse events during anaesthesia at a tertiary referral hospital in Ethiopia, than reported in current literature from LMICs. There is potential for large volume data to be produced and learnt from with a reporting system in place in this setting. The most common event was desaturation detected by pulse oximetry, particularly in paediatric surgery.

CONCLUSION

The most common perioperative complication was cardiac arrest followed by unexpected difficult airway. Other complications were pulmonary aspiration, stroke or coma, and malignant hyperthermia.

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