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RESEARCH ARTICLE

INTRA-OPERATIVES INCIDENTS AND PATIENT SAFETY

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ABSTRACT

The incidents arising from care have been the target of worldwide discussion, reflecting on improving the quality and safety of care, as important indicators. This study aimed to identify the prevalence of incidents in the operating room in a teaching hospital in Central Brazil. This was a retrospective cross-sectional study. Data was collected through analysis of 700 medical records of patients older than 18 years undergoing clean surgeries from 2013 to 2015. We found a prevalence of 6% (n=42) incidents during surgery, 14.3% (n=6) related to the structure and 85.7% (n=36) to the process. Of these, 69% (n=29) related to patient safety and 31% (13) related to worker safety. This study provides subsidies for (re)formulation of preventive strategies and the formation of a safety culture.

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INTRODUCTION

Health care predisposes the patient to various risk situations, and hospitalization itself is an intervening factor for the occurrence of an unexpected event. The World Health Organization (WHO) estimates that 1 in 10 patients on the planet are victims of avoidable errors or incidents during care due to incorrect interventions and planning (Organização Mundial Da Saúde, 2013). Although surgical procedures are intended to save lives, safety failures in surgical care procedures can cause considerable damage (Organização Mundial Da Saúde, 2013). Nominally, the types of risks that patients are exposed are: the Incident, event or circumstance that could have resulted in unnecessary harm to the patient; The Adverse Event (AE), which result in damage and Damage, itself, impairment of the structure or function of the body and / or any effect thereof, including illness, injury, suffering, death, disability or dysfunction, character Physical, social or psychological (BRASIL. Ministério da Saúde; Conselho Nacional de Saúde, 2013). Patient safety, defined as the minimally acceptable reduction of the risk of unnecessary

harm associated with health care (BRASIL. Ministério da Saúde; Conselho Nacional de Saúde, 2013), can be achieved through three complementary actions: avoiding the occurrence of AE, making them visible if they occur And to minimize its effects with effective interventions (Organização Mundial Da Saúde, 2013). Therefore, proactivity and anticipation of problems are integral parts of the security culture in any organization (Fragata, 2010). Incidents arising from care have been the targets of worldwide discussion, reflecting improved quality and safety of care as important indicators. In this sense, the problem of surgical safety is recognized all over the world and goes through the infrastructure of services and human performance. Indicators are fundamental quality tools because they point out aspects of care that can be improved by making patient care free of risks and failures and therefore safer (Nascimento et al., 2008). The quality of health care can be assessed by the triad: structure, process and outcome. The structure can be understood as the physical, human, material, equipment and financial resources. The process refers to activities involving health professionals and users, including diagnosis, treatment, ethical aspects, professional-patient relationship. The result corresponds to the final product of the care, considering the health, satisfaction of standards and expectations of the users (Donabedian, 1978). The surgical

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center environment (SC), due to its peculiarities, is one of the most complex units of the hospital environment. It is characterized by a set of facilities that allows to perform the surgery in the best conditions of safety for the patient and team, whose measurement of the good performance is directly related to the quality of its own processes and the processes of the services that support it (Santos and Rennó, 2013). Health care during the perioperative period has been a global health impact, since it is estimated that 234 million surgeries occur every year, and that approximately seven million patients suffer from some postoperative complication and one million die As a result of these procedures (Organização Mundial Da Saúde, 2013).

The WHO estimates that the occurrence of AE is 4 to 16% of all patients hospitalized, of these, more than half affect the surgical patients. In addition, it claims that more than 50% of such incidents are preventable. In the Brazilian context, a study identified that approximately 8% of hospitalized patients suffered one or more AE, 67% of which were preventable (Mendes *et al.*, 2009). In 2004, the Global Alliance for Patient Safety was created by WHO as the central element in the formulation of Global Challenges, which address issues that are representative of the major health care risk factors. Safety in surgical care, through the "Safe Surgery Saves Lives" program, launched in 2008/9, focused on the prevention of surgical site infection, safe anesthesia, safe surgical teams and implantation of surgical assistance indicators (Organização Mundial Da Saúde, 2013). To increase this challenge the WHO developed guidelines for safe surgery and a checklist based on surgical safety standards. These measures aim to reinforce safety practices and help surgical teams to reduce the occurrence of incidents in three moments: before anesthetic induction, before the surgical incision and before the patient leaves the surgical room. It is presented as a tool to improve the safety of surgeries, reduction of surgical deaths and unnecessary complications (Organização Mundial Da Saúde, 2013). Considering the incident an avoidable event, it is necessary to detect its prevalence in surgical patients. Therefore, this study aims to identify the prevalence of incidents occurring in the surgical center of a teaching hospital.

MATERIALS AND METHODS

A cross-sectional retrospective study of patients submitted to clean surgeries from January 2013 to December 2015 in a public teaching hospital in the Brazilian Midwest. The medical records of patients older than or equal to 18 years and excluding those submitted to more than one surgical procedure were included when at least one was not classified as clean, and the medical records were incomplete or illegible for analysis. The total of 3,823 records was chosen for the study, and considering an accuracy of 2.5%, 1.5 for drawing effect and 95% confidence interval, the sample contained 626 medical records. Due to possible losses due to selection failures and operational difficulties, an increase of 11.8% was calculated, totaling 700 medical records. The selection of records for the collection of information was by systematic probabilistic sampling, which were organized in alphabetical order and inserted with double conference in a spreadsheet of Microsoft Excel version 2007. The information was collected through active search of the records of care in the operating room. The analyzed variables were the incidents in the

operating room, recorded in the file of the intraoperative, related to the structure and the process. The data were annotated in an instrument, elaborated and submitted to the evaluation of content and appearance by specialists. For the analysis, the data were entered into a database of the Statistical Package for Social Science (SPSS), version 15.0 for Windows and analyzed descriptively by means of frequency and percentage. The study was approved by the Human and Animal Research Ethics Committee of the Federal University of Goiás, Brasil.

RESULTS

We reviewed 700 medical records of patients submitted to clean surgery. The majority were female (57.1%), between the ages of 18 and 59 (70%).

Table 1. Incidents occurred during the intraoperative period of clean surgeries, according to the organizational structure of a university hospital, from 2013 to 2015. Goiania, Brazil, 2017

Structure	n	%
Contamination of the surgeon's glove by the presence of insects in the operating room.	2	33,3
Fall of the patient by unlocking the surgical table, leading to the suspension of surgery.	1	16,7
Sentinel lymph node biopsy not performed due to damaged equipment.	1	16,7
Defect heart surgery equipment.	1	16,7
Breakdown of equipment during orthopedic surgery.	1	16,7
Total	6	100

The prevalence of intraoperative incidents in the total population of patients undergoing surgical procedures was 6% (n = 42). 14.3% (n = 6) related to the structure (Table 1) and 85.7% (n = 36) to the process (Table 2). Of these, 69% (n = 29) related to patient safety and 31% (n = 13) related to worker safety (accidents with biological material), five of them with the same professional.

Table 2. Incidents occurred during the intraoperative period of clean surgeries, according to the work process of a university hospital, between 2013 and 2015. Goiania, Brazil, 2017

Process	n	%
Accident with perforating-puncture during surgery.	13	36,1
Epidural anesthesia failed, converted to general anesthesia.	5	13,8
Difficulty in intubation due to lack of technical skill of the professional.	2	5,6
Hemodynamic instability during surgery.	2	5,6
Vomiting after anesthesia.	2	5,6
Electric scalpel burn in left thigh.	2	5,6
Allergic drug reaction (antibiotic and anesthetic).	2	5,6
Perforation of the subarachnoid space during epidural block.	2	5,6
Failure of thoracic puncture attempts.	1	2,8
Carotid artery injury during cervical tumor excision surgery, requiring revascularization and arterial grafting.	1	2,8
Laceration of the spleen due to the wall retractor.	1	2,8
Laceration of the pancreas and bleeding in the suprarenal bed, during a surgical maneuver.	1	2,8
Abundant vomiting of solid foods in megaesophagus surgery after epidural anesthesia, requiring general anesthesia and antimicrobial prophylaxis due to bronchoaspiration.	1	2,8
Evacuation in the operating room.	1	2,8
Total	36	100

DISCUSSION

International studies have shown that the mortality due to adverse events in the hospital environment is 3.21% (Huddleston *et al.*, 2012). It is estimated that the prevalence of AE in the surgical environment is three times higher, 15% to 21.9% (1.9). The amount of AE found, when compared to the high demand and turnover of patients, is low, indicating underreporting. This fact is also pointed out in other studies, whose registered numbers represented only 25% of the errors occurred, which were not reported or underreported, not demonstrating the reality and making it difficult to know the real causes and the planning of prevention strategies for the occurrence of the events adverse (Souza *et al.*, 2011). A recent study identified 42 adverse events from 2005 to 2009, showing a prevalence of 1.67%. The occurrence of these incidents indicates that failures in structure and processes may be causing and increasing the risk of harm to patients and that assistance needs improvement (Souza *et al.*, 2011). In this perspective, WHO encourages the recovery of incidents in order to promote a system of active resilience in health institutions, with the aim of continuously preventing, detecting, mitigating or mitigating risks and promoting improvements (Organização Mundial Da Saúde, 2013). Incidents related to structural failures characterize irregularities in nursing care and service management. The complexity of the surgical center (SC) requires that the nurse's performance is in harmony with the direction and administration of the hospital, aiming at the supply and maintenance of materials and equipment indispensable to perform different surgical procedures, without prejudice to the patient (Stumm *et al.*, 2006). The nursing team is responsible for the assembly of the operating room, an activity in which the provision and management of materials and equipment, indispensable for performing anesthetic-surgical procedures, ie gathering the necessary materials for the specific type of surgery, Evaluate the missing materials, as well as test the equipment before the patient even enters the surgical center (Lima *et al.*, 2013). The WHO indicates a checklist to assist the operating room conference. In accordance with the perioperative nurse competencies, the checklist can be a strategy to guarantee the availability of the necessary items for the procedure and in conditions conducive to the safe use. The application of a checklist as a standard for the control of anesthesia equipment before its use demonstrated a decrease of faults from 14 to 4%, ensuring safety to the anesthetic procedure (Organização Mundial Da Saúde, 2013). Regarding the physical structure of SC, the malfunction of air conditioning, for example, can lead to incidents, such as the presence of insects in the operating room, an important threat of surgical site infection. In 2008, a study in Goiânia, analyzed samples of flies from a hospital bathroom, and 0.8% showed bacterial growth of gram-positive streptococci isolated and in pairs, in addition to short and fine gram-negatives, bacteria in 100% and Coliforms in 79%, confirming the dangerousness and transmissibility of pathogens in hospitals by means of flies (Kurokawa *et al.*, 2008).

The most common adverse event among hospitalized patients is the fall, with an incidence of 12.4% in surgical settings (Diccini *et al.*, 2008), reveals inadequacies in planning, control and management in the health service. It is considered an important indicator of the quality of nursing care and one of the indicators monitored by the agency Commitment to

Hospital Quality (CQH), which aims to improve the quality of care, aiming at excellence in hospital care (NAGEH. Manual de Indicadores de Enfermagem, 2012). Studies show that 23% of falls in hospitalized patients result in injuries, 83% abrasions, bruises and lacerations and 9% fractures (Diccini *et al.*, 2008). Besides the damages to the physical, mental or moral health of the patient, the need for a new treatment also causes the cancellation of elective surgeries, which leads to the increase of hospital costs due to bed and / or operating room occupancy, to waste Of sterile material, the time spent by personnel involved in the preparation of material and surgical room and the replacement of the patient in the surgical schedule. This reality interferes with the administrative and logistic aspects and requires the adequacy of the organizational structure for improvements in the dynamics of the service (Landim *et al.*, 2009; Sá *et al.*, 2011). Avoidable incidents related to the anesthetic procedure were studied by Torregrosa (Torregroa, 1994), often associated with poor experience and familiarity with the equipment or procedure, poor communication with the surgeon, lack of experienced anesthesiologist supervision, emergency cases, fatigue, annoyance and restricted visual field, factors easily found in teaching hospitals. The pre-anesthetic evaluation allows the anesthesiologists to plan the pre, intra and postoperative care required under special conditions, since it is indispensable to know the clinical conditions of the patient well in advance, in addition to being mandatory before any elective anesthesia (BRASÍLIA/DF, 2006). When performed at the outpatient level, this assessment ensures that all anesthetic-surgical risks will be identified and corrected prior to the initiation of the surgical procedure.

Allergies, difficult airway, risk of bronchoaspiration, blood loss greater than 500 ml in adults and 7 ml / kg in children, among others, are considered by WHO as anesthetic-surgical risk factors. Some respiratory changes (laryngeal / bronchospasm), hemodynamic instabilities (hypo / hypertension, hypoxemia), failures in anesthetic blockade and difficulty in intubation, found in the study, can be identified during the preanesthetic evaluation, primordial for multiprofessional care planning with Security (Organização Mundial Da Saúde, 2013). The preoperative evaluation ensures comfort, safety to the patient and improves the performance of the care indicators. The identification of conditions that impose risk and the search for the best clinical condition of the patients in the preoperative period reduce mortality and postoperative morbidity. One study showed that 11% of serious intraoperative incidents occur due to deficiency in the preoperative evaluation, considering that half of these incidents could have been avoided (Yen *et al.*, 2010). Some procedures are associated with complications even when used properly and by experienced professionals. It is important to separate the complications that occur despite adequate use and by trained professionals, due to undue orientation and technical unpreparedness (Pereira *et al.*, 2000). One factor that may explain the number of incidents would be gaps in professional training, failures in the teaching-learning process leading to inability. Academic training is also currently deficient from several angles: the quality of teaching, the methods, the concepts of the doctor-patient relationship and the understanding of the process of becoming ill is questioned, and the excessive dedication to The organism's fragmented approach, the student's early specialization, among other aspects (Velho *et al.*, 2012). In relation to acts of negligence,

malpractice and recklessness, health professionals respond to professional ethics councils, which also contributes to the creation of a culture of responsibility and security. This culture is characterized by systemic and continuous application of initiatives, procedures, conduct and resources in the evaluation and control of risks and adverse events that affect safety, human health, professional integrity, the environment and the institutional image (BRASIL. Ministério da Saúde; Conselho Nacional de Saúde, 2013). The burn plate notification by electric scalpel points out the negative aspects of the care promoted by nursing. Accidents involving the electric scalpel are potentially damaging, since their occurrence is not often noticeable since, in most cases, patients are unconscious or debilitated, unable to react to stimuli or disturbances (22).

The risk of burns is mainly associated with incorrect placement of the electrocautery plate and inadequate electrical installations. Although the risks have been reduced with technological advancement, it should be borne in mind that the patient's body is an integral part of the electrical circuit and, therefore, faults in this circuit can cause various damages (SOBECC. Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, 2013). It should be noted that the nurse of the SC should use as a tool to ensure safety in the use of the electric scalpel the protocol recommended by the WHO that is part of the process of safe surgery (Santos and Rennó, 2013). Preparation of the gastrointestinal tract is necessary in some surgical procedures due to the risk of intestinal contents being released into the peritoneum and evacuations causing contamination and, consequently, an infection (Crema *et al.*, 2009). It is known that it is necessary that all patients are submitted to preoperative preparation, in the case of esophageal surgery, mechanical cleaning of the esophagus with 0.9% saline solution is recommended through the passage of a roesophageal probe Fouchet or Levine coarse on the eve of the operation (Crema *et al.*, 2009). Some studies report that the hospital sector most at risk of accidents with biological material is the surgical center, due to the greater presence of blood and other body fluids, as more professionals work concomitantly, handling high-risk materials (SOBECC. Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, 2013). In addition, the lack of care (due to fatigue, for example) or the performance of procedures requiring rapid action (such as in emergencies) are also frequent causes of percutaneous accidents, as well as the poor quality of the equipment, Lack of trained professionals or the combination of these factors (Gusmão *et al.*, 2013). The quality of nursing care, both in the period before surgery and during and after the surgery, interferes in the results of the procedure performed and patient safety (Santos and Rennó, 2013). Therefore, the nurse's awareness as care manager is fundamental in order to enrich his leadership with constant vigilance, preventive action, tracing actions that ensure patient safety in all stages of the surgical procedure.

Conclusion

It was verified the occurrence of 42 incidents in the intraoperative, related to the structure and the process, with prevalence of 6%. Most of them relate to the care processes. Structural and procedural failures can influence hospitalization time with economic and social repercussions. The importance of nursing for the promotion of safe surgeries is evidenced, since it is responsible for a series of activities ranging from the

provision and prediction of materials to constant contact with the patient. It is recommended the implementation of the Safe Surgeries Program Saves Lives of the World Health Organization in order to subsidize the systematization of a safe and quality assistance, with a view to guiding the elaboration and implementation of protocols of safe care. It is emphasized that patient and worker safety will not only be ensured through the insertion of protocols, but also through the promotion of safety culture in the various professional categories involved in the process. Establishing a safety-oriented work culture is at the heart of incident prevention. The results of the study are limited because the retrospective review of medical records faces methodological obstacles related to the impracticability of its routine use by health services, resulting in a lack of information, especially in relation to incidents, leading to underestimation of rates.

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