Original Article

Occurrence of incidents at a surgical center: a documentary study

Ocorrência de incidentes em um centro cirúrgico: estudo documental

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ABSTRACT

The objective of the study was to estimate the prevalence of incidents occurred during surgeries at a surgical center and to analyze the types and causes of occurrences. A cross-sectional retrospective study, having as data source 300 records of patients submitted to surgery procedures during July and December of 2013, at a teaching hospital from the Central-Western Region of Brazil. A total of 26 incidents were found and the estimated prevalence was 8.7%. Incidents related to the suspension of surgeries, gloves perforations, and accidents with the patient by technical failures in the procedure and, technical failures on the service management were attributed to team distraction, prescription failure, lack of knowledge, work overload, and failure of service organization. The study found the incident systemic and multi-factorial characteristic and brought up indicators for the need of improvements on the management process of materials and human resources.

Descriptors: Nursing; Safety Management; Iatrogenic Disease; Perioperative Care; Patient Safety.

RESUMO

O objetivo do estudo foi estimar a prevalência dos incidentes ocorridos durante cirurgias em um centro cirúrgico e analisar os tipos e causas das ocorrências. Estudo transversal, retrospectivo, tendo como fonte de dados 300 prontuários de pacientes submetidos a procedimentos cirúrgicos no período de julho a dezembro de 2013, em um hospital de ensino da região Centro-Oeste do Brasil. Um total de 26 incidentes foi encontrado, estimando prevalência de 8,7%. Incidentes relacionados à suspensão de cirurgia, perfuração de luvas, acidentes com paciente por falhas técnicas no procedimento e falhas técnicas no gerenciamento do serviço foram atribuídos à distração da equipe, falha na prescrição, pouco conhecimento, sobrecarga de trabalho e falha de organização do serviço. O estudo evidenciou a característica sistêmica e multifatorial do incidente e levantou indicadores que indicam a necessidade de melhorias no processo de gestão de materiais e recursos humanos.

Descritores: Enfermagem; Gestão da Segurança; Doença Iatrogênica; Assistência Perioperatória; Segurança do Paciente.

INTRODUCTION

The Surgical Center (SC) is a unit inside the hospital to perform surgical procedures, intended to diagnose or treat diseases from diverse etiologies[1]. Due to procedure diversity, there is an intense circulation of health professionals from different fields, in many times, favoring the occurrence of incidents[2].

Incidents are defined as non-intentional occurrence from health assistance that can result in injury to patients, as well as, incapacity, temporary or permanent dysfunction, longer hospital stays and even death[3].

According to its consequences, incidents can be classified as of noticeable circumstance, when exist a situation with a significant potential to occur a damage; quasi errors are incidents intercepted for some reason and does not reach the patient. Incidents without harm are those affecting the patient but harm is not detected and, at last, the event with harm is the adverse event (AE), when the result harms the patient[3].

The global concern about safety issues was evident since the year 2000, when the Medical Institute from United States published the report entitled "To err is human: building a safer health care system" pointing that approximately 98,000 people die annually, victims of mistakes from health care. Since then, a movement in favor of patient safety in health establishments started[4].

The safe care in the surgical context is a pressing challenge in institutions providing health assistance services. Estimates point that 234 million surgeries will be performed, with seven million incident occurrences and two million of deaths, being 50% of those avoidable. Among high complexity surgeries, about 3 to 16% of surgical procedures in admitted patients are registered, with significant death rates[5].

A retrospective documentary study identified the occurrence of 42 AEs, and 26.2% were related to structural problems in the surgical room as maintenance of equipment and material supply, and 73.8% to assistance, as intercurrences, anesthesia related complications, burns by the electrical scalpel, absence of a humanized care, lack of care when checking the patient post-surgery and falls[2].

An investigation conducted in three teaching hospitals in Rio de Janeiro found the occurrence of 38 patients exposed to 41 surgical AEs, revealing that many times the patient is exposed to more than one event on the same admission[6].

Main causes for surgical AEs occurrences refers to the routine when programming elective procedures, work overload or distraction by other patients, work colleagues or occurrences in the unit, lack of attention when changing work shifts and lack of communication between team members[7].

The correct prepare during pre-surgery is essential to reduce or even avoid that some incident happens during surgery[3]. An analysis conducted in 750 admissions in a surgical room found 5.672 incidents registered on the records, related to the procedure/clinical process, with acute pain post-surgery; fails on technical procedures due to lack of professional ability; tubular devices that are removed before the programmed time; surgery suspensions; adverse reactions to medications and hospital infections[8].

Aiming to awaken the professional conscience and the political compromise to improve safety in health assistance, the World Alliance for Patient Safety launched the campaign "Safe surgeries save lives", to reduce morbidity and mortality caused by surgical procedures[9].

This is a global aim proposed to increase quality patterns desired in health services, contemplating the prevention of infections in the surgical site, safe anesthesia, safe surgical teams and indicators of surgical assistance[9].

In this sense, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and other organizations with the goal to guide quality assistance and safety launched programs to promote patient safety and minimize the occurrence of incidents in care environments[10].

In Brazil, in order to reduce risks from health assistance, the Health Ministry (MS), through the National Agency of Sanitary Vigilance (ANVISA), launched six operational protocols mentioning about drug therapy, risk of falls, hands hygiene, prevention of pressure ulcer, patient identification and safety during surgical procedures[11].

Considering the patient safety as the reduction to an acceptable minimum of the unnecessary risk of harm associated to health care[3], it is believed to be extremely important to diagnose incidents in SC of a teaching hospital that answer the following questions: What are the registered incidents by professionals? What is their involvement on incidents?

This theme awakens an international interest, as nowadays, the World Health Organization (WHO) guides its attention to the quality and safety during surgical procedures[2]. Thus, health institutions should be attentive to this reality, so they can plan and prevent actions, and keep an elevated quality and safety standard when assisting patients.

With the intention to answer these questions, the objectives of this study consisted of estimating the prevalence of incidents occurred during surgeries in a surgical center and to analyze its types and causes.

METHODS

A retrospective, cross-sectional study with quantitative approach, developed at a university hospital in the Central-Western region of Brazil of high complexity. The hospital exclusively attends users of the Unified Health System (SUS), and constitutes the practice field of academics from health related courses.

The surgical center is located on the second floor and have 11 surgical rooms equipped for safe surgical procedures. The attended specialties on surgeries are: gynecology and obstetrics, general surgery, vascular surgery, thoracic surgery, heart surgery, gastroenterology, orthopedics, plastic, urology, neurology, proctology, otorhinolaryngology and maxillofacial. According with the data from the institution, in 2013 more than 9,500 surgeries were performed with an average of 26 surgeries per day.

The study population contemplated the patients submitted to surgery between 01 of September to 31 of October of 2013. Data was collected during February and June of 2014. The data source was patient's records filed on the Medical File and Health Information Service (SAMIS) from the hospital.

The instrument used for data collection was structured by researchers and submitted for assessment of experts, specialists from management and administration fields who research about this theme. It contained objective questions about the surgical procedure and reports about the incidents.

We investigated the incidents from the analysis of registries done by health professionals of the intra-operative period, being those: form of surgery description, anesthesia description, and nursing evolution. We excluded patients with incomplete records, lacking the forms mentioned above for investigation and record of obstetric patients, once the hospital has a SC specialized to attend this population.

The data collection started only after written authorization of the hospital directory and SAMIS coordination. The study researcher conducted it in agreement with the availability of records from the hospital service.

Data was structured on the software Statistical Package for the Social Sciences, version 20.0 for Windows, and descriptively analyzed presenting means and standard deviations for continuous variables; and relative and absolute frequencies for categorical variables.

We calculated the incidence prevalence and the confidence interval of 95%, considering the number of exposed patients and, at least, one incident as numerator and the number of the total population as denominator.

We transcribed the registries of incidents to form a body of analysis and submitted it for assessment to

classify the incidents[3]. We used the letter P to exemplify each case, following a cardinal number, in accordance with the data collection order.

This study is linked to the project "Analysis of adverse events occurrences in a hospital part of the Sentinela Network from the Central-Western Region", approved by the Ethics Committee from the Clinical Hospital of Universidade Federal de Goiás, under the protocol nº 064/2008. All other ethical aspects were observed in accordance with the Resolution nº 466/2012, from the Brazilian National Health Council[12].

RESULTS

The analysis of 300 records from patients submitted to surgical intervention found the diversity of client's profile. The patient's characteristics are presented in Table 1.

Table 1: Characteristics of patients submitted to surgical intervention at a teaching hospital. Goiania, GO, Brazil, 2014.

Characteristics of patients	N	%
Gender		
Female	167	55,3
Male	132	44,6
Age		
Until 10 years	45	15,0
11 to 20 years	23	7,7
21 to 30 years	35	11,7
31 to 40 years	63	21,0
41 to 50 years	52	17,3
51 to 60 years	28	9,3
61 to 70 years	35	11,7
71 years or more	19	6,3
Comorbidity		
Yes	71	23,7
No	223	74,3
Not informed	07	2,0
Total	**300**	**100,0**

Females corresponded to 55.3% of patients. Age varied from 1 to 92 years, the mean was 37.9 years (± 21,3 years), and the predominant age group was 31 to 50 years for 38.3% of the population. Comorbidities were found in 23.7% of patients and systemic hypertension and diabetes mellitus were more frequently reported.

Because this is a reference hospital, clinical characteristics of admissions are diverse, as presented in Table 2.

Elective was the predominant type of admission for 66.7% of patients. Admittance time during pre-surgery varied from one to 40 days, with an average of 2.6 days (±5 days). Admittance time after surgery varied from one to 71 days, with an average of 3.2 days (±6,5 days). In both cases, the interval up to two days of admittance was predominant, respectively, for 54.3% e 64.7% of patients.

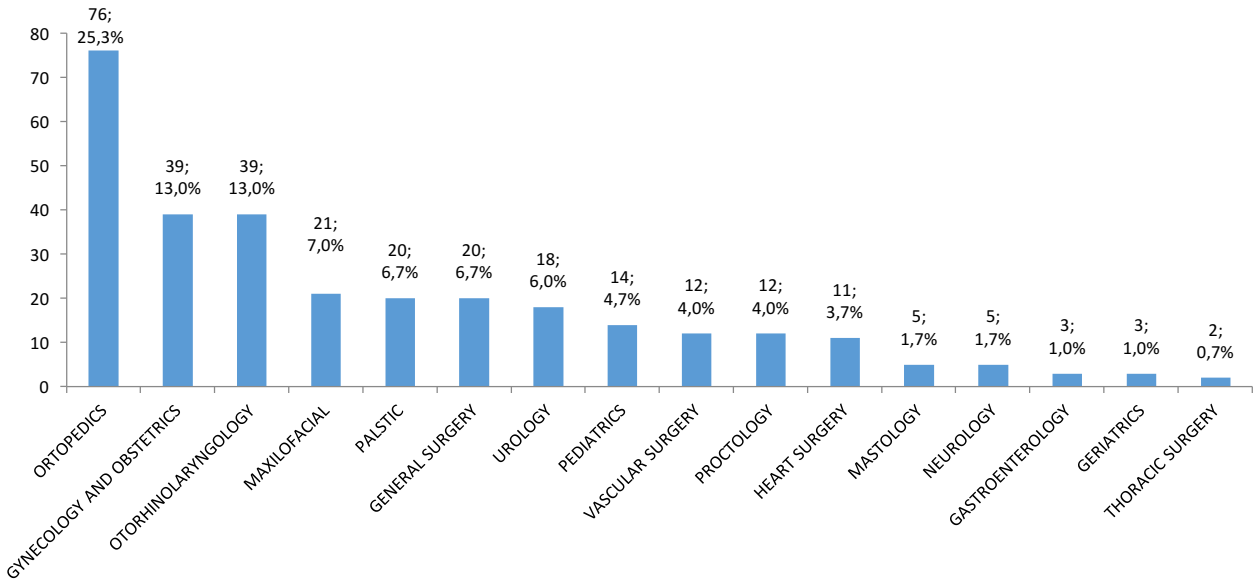
Regarding tubular devices, 27.7% of patients used probes, bladder probes in its majority; 96% used predominantly peripheral catheter and 43.3% used the tracheal tube.

Surgical interventions conducted during the study period contemplated diverse specialties, as demonstrated on Figure 1.

Table 2: Clinical characteristics of patients admitted for surgical interventions at a teaching hospital. Goiania, GO, Brazil, 2014.

Characteristics of admissions	N	%
Type of admission		
Urgent	100	33,3
Elective	200	66,7
Duration of pre-surgery admittance		
Surgery on the same day	67	22,3
1 to 2 days	163	54,3
3 to 5 days	29	9,7
6 to 10 days	16	5,3
11 days or more	17	5,7
Were admitted for surgery but did not do it	08	2,7
Admittance time post-surgery		
Discharge on surgery day	17	5,7
1 to 2 days	194	64,7
3 to 5 days	45	15,0
6 to 10 days	18	6,0
11 days or more	17	5,7
Were admitted for surgery but did not do it	08	2,7
Use of probes		
Yes	83	27,7
No	217	72,3
Use of catheters		
Yes	288	96,0
No	12	4,0
Use of tracheal tube		
Yes	130	43,3
No	170	56,7
Total	**300**	**100,0**

Figura 1: Medical specialties of patients submitted to surgical intervention at a teaching hospital.



Orthopedics was the most frequent surgical specialty with 25.3%, followed by gynecology/obstetrics and otorhinolaryngology, with 13%.

In average, 26 surgeries were conducted daily. The characteristics of surgical intervention are presented on Table 3.

Table 3: Characteristics of surgical interventions conducted in patients at a teaching hospital. Goiania, GO, Brazil, 2014.

Characteristics of surgical interventions	N	%
Surgery type		
Urgency/emergency	39	13,0
Elective	253	84,3
Suspended surgeries	08	2,7
Potential for contamination		
Clean	146	48,7
Potentially contaminated	99	33,0
Contaminated	23	7,7
Infected	10	3,3
No registry	14	4,7
Suspended surgeries	08	2,7
Infusion of blood product		
Yes	04	1,3
No	283	94,3
No registry	05	1,6
Suspended surgeries	08	2,7
Drain use		
Yes	61	20,3
No	228	76,0
No registry	03	1,0
Suspended surgeries	08	2,7
Antibiotic prophylaxis		
Yes	252	84,0
No	31	10,3
No registry	09	3,0
Suspended surgeries	08	2,7
Registry of professionals		
Surgeon	240	80,0
Nurse	14	4,7%
Nursing Technician	252	84,0
Nursing Assistant	27	9,0
Anesthetist	292	97,3
Resident Physician	52	17,3

Among the surgical interventions, 84.3% were elective and clean surgeries were predominant in 48.7% of cases. The need for blood product infusion was found in 1.3% of surgical procedures. The use of drain was found in 20.3% and antibiotic prophylaxis was conducted in 84% of patients.

Regarding the professionals participating on the evaluation of the surgical procedure, the anesthetist was in first place with 97%, following the nursing technician with 84%, the surgeon with 80%m the resident physician with 17.3%, the nursing assistant with 9% and the nurse with 4.7% of participation.

From the total of admitted patients, 26 were exposed to some type of incident, estimating the prevalence of 8.7% (36/300; CI95%: 5,9%-12,3%). The incidents are described on Table 4.

Table 4: Characteristics of incidents occurred with patients at a teaching hospital. Goiania, GO, Brazil, 2014.

Characteristics of incidents	N	%
Type of incident		
Suspended surgery	09	34,6
Glove perforation	07	27,0
Technical flaws involving the patients (pain during surgery; patient's reaction; urethral injury; recto perforation, unsuccessful anesthetic block)	05	19,2
Management of service (organization flaw and lack of material, suspended exam with the patient in the room, loss of material sample)	05	19,2
Total	**26**	**100,0**

Suspended surgeries corresponded to 34.6% of incidents, it was justified by the lack of professionals integrating the surgical team and, still, by the lack of pre-surgery assessment:

Patient was going to be submitted to septoplasty and tonsillectomy, but, suspended surgery, by lack of circulating (P61);
Patient would be submitted to superior and inferior blepharoplasty, however, surgery suspended by lack of anesthesiologist (P59);
Surgery suspended by lack of cardiovascular assessment team (P1).

Glove perforation was found in 27.0% of registered incidents:

After the beginning of the procedure the glove on the doctor's right hand had to be changed as it was perforated (P222).

The incidents related to organizational management corresponded to 15.4% of incidents and found flaws in the work process, as pointed by the professional's registry:

I received room 05 with the client already anesthetized and the surgical team in phase of degermation of hands. There was no wall aspirator, bottle aspirator, electrical scalpel, supplies' cart for the surgery. Still lacking materials for degermation on the patient and disorganization on the environment compromising the quality of the offered assistance (P268).

Accidents with the patient were found in 19.2% of incidents, pointing technical flaws and lack of abilities by the professionals during the intervention, was reported in the registries:

Patient with pain facies, 25mg of captopril and 2g of pre-surgery dipyrone done. On intra-operative, sedation and 100mg of fentanyl + 3mg of midazolam hydrochloride (P4);
Patient initiated acute edema in the lung reverted with furosemide (P14);
Patient presents large and intense bronchospasm. Suspended surgery (P296);
During vesical tubbing there was urethral lesion recognized by bleeding (P267);
NOTE: Inferior recto perforation at the level of the pelvic floor (P93).

The incidents related to management of service corresponded to 19.2% of incidents and found flaws in the process of the institution work, including service monitoring and low quality of equipment, as registered by professionals:

I received room 05 with the client already anesthetized and the surgical team in phase of degermation of hands. There was no wall aspirator, bottle aspirator, electrical scalpel, supplies' cart for the surgery. Still lacking materials for degermation on the patient and disorganization on the environment compromising the quality of the offered assistance (P268).

Unable to study via biliary due to the low quality of images, in accordance with the radiology technician, the issue was the bad quality of films (P254).

DISCUSSION

In this study, it was found 8,7% of surgical incidents in general. This result corroborates with study from other authors, where in these selected studies about incidents/AE were found 1.6% , 5.6% and 18.7% (average 82.3) [2,6,8].

Problems with the management of human resources generate losses for the institution, the surgical cancellations were the most evident incidents in the study, as well as, in a study where they analyzed incidents without harm or adverse events, in a sample of 750 admissions, they found about 7.34% of surgical suspensions[8].

When surgical cancellations occur, it brings losses to the institution as well as to the patient. It prolongs the time of admission, promoting continuity of the patient in an environment inclined to risks and even harms and, psychological consequences often not commented on studies.

For the hospital, it frequently increases the financial and operational costs caused by the waste of sterile materials and supplies and the occupation of the operating room, as in its majority, surgeries are suspended with the patient in an operative position[13]. Thus, materials are considered contaminated and are discarded; professionals scheduled to assist the procedure stay idle while waiting for a medical decision, besides the negative influence in the quality concept from the hospital institution[13].

A longitudinal study pointed the rate of surgical suspension of 23.0% at an university hospital and the suspension occurred more frequently in the general surgery specialty[14]. The study also found the inadequate programming and lack of sterile clothes as main causes to cancel elective surgeries.

Therefore, health professionals should predict situations that can affect the service performance. Changes in the work process are needed to avoid unnecessary cancelations and to guarantee profitability of the health system, as well as to establish an effective communication, a careful planning and an efficient use of available hospital resources[14].

The adequate management of human resources guarantees a quality assistance for patients, besides improving the culture of safety and organization[5]. For an institution that provides assistance and health care to incorporate concepts of quality focused on patient safety, it is necessary to have an adequate dimension of professional's chart/schedule, training of personnel and satisfaction at work through recognition of service, satisfactory salary, good relationship with the work team and better work conditions[15].

All these factors ended up interfering on the quality concept formulated by Donabedian used until nowadays by the Joint Commission International (JCI), Joint Commission Accreditation and Health Care Organization (JCAHO) and the National Accreditation Organization (ONA), organizations that measure assistance quality in health institutions.

The management ends up interfering directly on the organizational and safety cultures, and patient safety. It was found 19.2% of the cases about questions related to disorganization and lack of materials. The same percentage was also found for technical problems, and this situation reflects on what was mentioned before. When analyzed, these data indicate the possibility of attitudes of (non)management from nursing professionals.

To avoid and consequently minimize these incidents, these professionals should not be seen as a unit or an independent being, but as a team.

One aspect to highlight, especially in public institutions, it the scarcity, the lack and/or bad conditions of materials for consumption. It generates stress on the team who will act on that procedure, it breaks the assistance continuity that is being conducted and can cause harm to patients[16]. This scenario denotes lack or fail of planning, as well as, incoherence on control

processes and information about management of materials.

Such reality influences the quality of service, demonstrates the relationship between problems on the structure and work process, and reflects directly on assistance results and points indicators interfering on the performance of health services[17].

In the SC, the patient is submitted to diverse interventions conducted by different professionals, leaving the patient subject to accidents during procedures, a fact that can be corroborated by a study, where 15.4% of patients suffered AE incidents, being 1.14% related to fail on procedures, showing that 7.7% were caused by flaws during the anesthetic process[18].

It is important to note that medical malpractice can be directly related to fail during the anesthetic process, as the anesthesiologist accompanies since prescription until the drug administration without the confront of another professional, in many times dealing with an urgency scenario and high complexity drugs[19]. Therefore, when dealing with a teaching hospital, many aggravated factors sometimes are common of the practice of trainees, residents, and interns without the proper assistance of a mentor.

The incidents caused by technical flaws can result in a severe harm to the patient and even result in death. This consequence is undesirable by all health professionals, as it can cause psychological issues, as anguish and stress for professionals and family members[20]. The institution also has losses, being compromised with the professional involved, morally, emotionally, and ethically[18].

The use of gloves is indispensable during any procedure requiring professional/patient contact and involving body fluids, as it decrease the risk of crossed contamination. When the glove perforation occurs, both professional and patient are exposed to transmission of pathogens. We found 2.3% of these incidents in our research. A study points that the product quality should be assessed, as tests conducted with surgical gloves did not present perforation risk[21].

Safety culture should be developed especially when there is some type of technical procedure is conducted, and it is extremely important for professionals to be trained and go to continued education, thus, this activity is not an isolated event but also a process to adopt good practices[22].

If this culture is developed inside the company, the risks of harms, being those light, moderate or severe; are decrease and in case it happens, it will be in a lower level than observed in the actual reality. From this, the professional needs to be compromised with a quality assistance, based on team work and in a collaborative way with peers and a multi-professional team[2].

Thinking about the prevention of these incidents, the institution should create and disseminate standard operational protocols, routines, guidelines, bundles, within others. Thus, standardized techniques, procedures and conducts will exist, increasing safety for patients and professionals, contributing with the increase of assistance quality[20].

CONCLUSION

The prevalence of incidents related to safety in the surgical context was 8.7%. Occurrences were attributed to lack of management of human and material resources, showing the importance of continuous assessment on health services for a qualified and safe assistance. The identified incidents resulted in possible harms for patients; however, they constituted indicators directing decision making of managers.

The study shows the need to investigate how monitoring of incidents happens in health services and the impact of this tracking on the promotion of action and cultural changes in the assistance context.

The involvement of managers, surgical team and patients in the systematized use of protocols for safe surgery, the permanent notification to track and prevent incidents, the socialization of this indicators and the learning process from mistakes, are recommendations that can contribute with patient safety.

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