EVALUATION OF PREDICTORS IN-HOSPITAL MORBIMORTALITY IN PATIENTS UNDERGOING URGENCY AND EMERGENCY SURGERY

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ABSTRACT

According to data from the WHO, 254 million surgeries are performed every year around the world. Of these, around 7 million patients suffer some post-operative complication and one million die. Urgent and emergency surgeries are identified as independent predictors of mortality and perioperative care is essential for the patient's good clinical development. This study aimed to characterize the population undergoing this type of procedure at HC-UFG and identify clinical and surgical factors related to higher mortality in the intraoperative period up to the seventh postoperative day. This is an analytical, prospective study. Data were obtained by reviewing patient records and printed anesthesia records. In the assessment of postoperative complications, the Postoperative Morbidity Survey scale, developed and validated specifically for this purpose, was used. 71 patients were followed, aged 41.7 +/- 24.5 years. 42.2% had some pre-operative risk situation. The presence of complications was observed in 40.8% and 8.4% died. Anemia (odds ratio [OR] 16.0, p < 0.05), major surgery (OR 13.3, p < 0.05), acute or acute chronic renal failure (OR 16.8, p < 0.05) and September (OR 0.5, p < 0.05) were significant for the occurrence of complications. These results may reflect the high complexity of the institution's patients. Knowing the profile of patients served helps in defining management strategies and creating specific lines of care for high-risk groups.

KEYWORDS: PERIOPERATIVE MORTALITY; NON-ELECTIVE SURGERIES; PERIOPERATIVE CARE.

INTRODUCTION

According to the World Health Organization (WHO), approximately 254 million surgeries are performed worldwide each year. Of these, about seven million patients experience some postoperative complication, and approximately one million die during or after the surgical procedure [1]. When considering only procedures performed on an urgent or emergency basis, the numbers are even more alarming, with some studies showing values that are 10 times higher than those found for elective procedures, in terms of mortality and surgical complications [2].

In many healthcare services, a series of challenges are encountered to provide efficient and quality care for critically ill patients. Among them, we can highlight the delayed hospital flow between the surgical indication and the procedure, including the internal bed regulation system, preoperative clinical optimization, routine performance of safe surgery checklists, among others [3].

The creation of institutional protocols emerges as an appropriate way to improve care and the quality of assistance provided. For this purpose, it is necessary to study the demand for patients undergoing emergency procedures, as well as the logistics and specific resources of each service [4]. Thus, the use of instruments developed to analyze perioperative risk is indispensable for a previous institutional analysis and may not reflect the reality of a location under study.

Considering that emergency surgeries are identified as independent predictors of mortality and that perioperative care is fundamental for the good clinical outcome of the patient, this study aimed to characterize the population undergoing this type of procedure at the Hospital das Clínicas of the Federal University of Goiás (HC-UFG).

Characterization of the study
This is an analytical, prospective and quantitative cohort study.
Characterization of research locations
The research was carried out at the Hospital das Clínicas of the Federal University of Goiás (HC UFG).
Characterization of the population
The sampling plan was based on the number of urgent and emergency surgeries that took place in the HC UFG surgical center.
Data Collection Instrument
Trans- and postoperative data were obtained by re-

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viewing the patients' medical records and printed anesthesia records, for up to 7 days postoperatively. Among the data related to surgery, the following were evaluated: surgical size; the time between surgical indication and its completion; the duration of the procedure and the need for reintervention.

In the assessment of postoperative complications, the validated Postoperative Morbidity Survey (POMS) scale was used, consisting of nine domains, which record morbidity according to the presence of established criteria.

Data analysis method

Fisher's test and Chi-square were used to compare categorical variables and Student's t-test was used for continuous variables. In order to select the predictor variables with the least possibility of overfitting, the logistic regression technique was used. A p value < 0.05 was considered. BioStat 5.0 was used.

Ethical aspects of the research

The study was carried out after consideration by the Research Ethics Committee (CEP) of HC UFG (Opinion report Number: 5,540,241). Participants or guardians signed the Free and Informed Consent Form before undergoing the study.

RESULTS

Demographic data, clinical characteristics and surgical procedures.

During the study period, 71 patients were followed, the mean was 41.71 (+/- 24.58), 63% female, 16.9% ASA I, 45% ASA II, 32.3% ASA III and 5% ASA > or = 4.

Among the surgeries, 47.8% were stratified as small, 29.5% as intermediate and 22.5% as major. The average time to perform the procedure was 1.8 +/- 0.98 hours. Regarding the time between the surgical indication and the procedure, 16.9% < 12 hours, 33.8% between 12 and 24 hours, 23.9% between 24 and 48 hours and 25.3% > 48 hours. The surgical specialties that received the most attention were orthopedics (25.3%), general surgery and urology (16.9%) and neurosurgery (14%). Postoperative complications were observed in 40.8% of the sample and 8.4% died.

Morbidity and mortality and postoperative complications.

Postoperative mortality was 8.4%, and 42.2% had one or more preoperative risk situations present. Among the preoperative clinical risk situations, anemia, sepsis, AKI or acute CKD, acid-base disorder, hemodynamic instability, water-electrolyte disorder, and neoplasia stood out, in order of prevalence. Anemia, the most common, was present in 65.5% of patients who presented peri- and postoperative complications.

Among the patients with peri- and postoperative complications, the presence of sepsis (42.2%) and acute kidney injury (AKI) or acute exacerbation of chronic kidney

disease (CKD) (27.5%) was also noteworthy. Regarding postoperative follow-up, complications were recorded using the POMS scale in 40.8% of patients, with the following being most common: pain (16.9%), respiratory (15.4%), hematologic (15.4%), and infectious (14%).

Risk predictors

The significant variables identified by univariate analysis or those with the highest plausibility of being associated with the outcome were included in the logistic regression technique. This strategy was adopted to reduce the possibility of overfitting due to the small number of events compared to the possible predictors. The ASA classification was excluded from the model, despite being universally accepted and having a defined prognostic value, as it is composed of the clinical factors defined in the study as preoperative clinical risk situations. Age was grouped into age groups because it showed a non-linear behavior and still did not enter the final model. Anemia (OR = 16.0; 95% CI 4.72 - 54.57), AKI or acute exacerbation of CKD (OR = 16.8; 95% CI 1.96 - 143.65), and sepsis (OR = 20.5; 95% CI - 4.13 - 101.4) were kept as significant patient-related risk factors for perioperative complications within 7 days. Among the surgical factors, only the large surgical procedure category (OR = 13.3; 95% CI 3.3 - 53.4) was related to the outcome after logistic regression.

DISCUSSION

Your study confirmed a high presence of postoperative complications in patients undergoing non-elective surgeries (40.8%). The mortality rate found (8.4%) was very close to the data found in the national literature on critically ill patients admitted to Intensive Care Units (ICU) in the postoperative period of non-cardiac surgeries [5]. This result reflects the high complexity of the population treated (37.3% of patients with ASA score ≥ III) and mirrors the difficulty of access and early diagnosis of surgical diseases in the population served by the Brazilian Unified Health System (SUS).

A study conducted at the Hospital das Clínicas in Porto Alegre, also considered a reference for tertiary level healthcare, evaluated the 30-day postoperative mortality of 187 patients undergoing non-elective surgeries over a two-month period. The study found a mortality rate of 14.4%. Advanced age, patient severity, and surgical complexity were significant factors associated with this primary outcome [6].

In order to seek strategies to improve outcomes for surgical patients, this study aimed to examine the clinical and surgical factors involved in the higher incidence of complications and death in emergency surgeries. Preoperative risk situations such as anemia, AKI or CKD, and sepsis made patients more susceptible to postoperative complications and death.

Anemia is a common finding in critically ill patients and those undergoing high-risk surgical procedures (around 60% of those admitted to the ICU) [7]. A recent systematic review demonstrated that anemia is an important risk factor for the occurrence of anastomotic leakage and postoperative infection, in addition to being associated with hemodynamic instability and tissue hypoperfusion in critically ill patients [8].

The medical literature does not define a minimum acceptable preoperative hemoglobin value. However, it is clear that chronic anemia is much more tolerable than acute anemia. The decision to perform a preoperative transfusion should take into account various factors, such as the type of surgery, anticipated blood loss, coexisting disease, and duration of anemia [9].

Iron deficiency anemia is the most common type of anemia. In this situation, oral or intravenous iron supplementation in the preoperative period is the preferred treatment, which may even reduce transfusion needs [9].

The high prevalence of sepsis among patients who developed surgical complications (48.2%) corroborates the profile of patients treated in the emergency room of this hospital, which does not include trauma. Brazilian studies show that sepsis is present in up to 73% of deaths and is responsible for the high prevalence of dysfunction of multiple organs and systems [5]. To minimize this outcome, it is important to administer antibiotics early and fluid resuscitation in the first hours to prevent tissue hypoperfusion [10].

Acute AKI or CKD was also another factor identified in our study. Its perioperative incidence has variable etiology, however, for all cases, renal failure is associated with mortality rates of 60% to 90%. Postoperative renal dysfunction is related to a higher incidence of gastrointestinal bleeding, respiratory infection and sepsis. The best evidence for treatment involves maintaining normovolemia [11].

The large size variable was an independent predictive factor for the occurrence of perioperative complications and death. The data presented corroborate current literature [12]. It is known that large emergency surgeries, such as abdominal surgeries, are accompanied by various factors that increase the risk of postoperative complications, especially in more vulnerable populations, such as fasting, use of multiple drugs, immobility, use of nasogastric tubes, and indwelling urinary catheters [3]. An audit conducted in 35 hospitals in the United Kingdom showed a high mortality rate (14.9%) in patients undergoing laparotomies. This evidence led to the creation of the NELA project - National Emergency Laparotomy Audit, which consists of a series of pre-, intra-, and post-operative measures to improve outcomes in this population. Among these measures are the surgeon-led care plan and prompt diagnostic definition, formal access to risk assessment for death and complications, early administration of antibiotics, and early surgery [14].

The time interval between surgery indication and the procedure, although an important factor in the context of emergency surgeries, was not significant for the occurrence of postoperative complications and mortality. This may be related to the fact that structured preoperative management minimizes the impact of identified risk situations and appears to be more relevant than the rapid performance of surgery.

The average time to perform the procedure was 1.8 +/- 0.98 hours. Studies show that elective surgeries lasting more than 2.1 hours are an independent risk factor for complications and increased hospital stay. In view of this, the importance of supervision of resident doctors by preceptors during the entire period of surgical intervention is highlighted [15].

Our cohort had a limited number of patients, although the number of individuals who developed postoperative complications was quite significant. This study can contribute significantly to standardizing care and helping to define management priorities.

It is also worth highlighting that the study was carried out in a tertiary hospital in a developing country. Access to the service is difficult and, together with the severity of the disease stage at the time of admission, may have influenced the results. The literature shows that there is an association between perioperative mortality in patients undergoing general anesthesia and the Human Development Index (HDI), with mortality being higher in developing countries compared to developed countries [16]. These studies demonstrate the importance of the organization of health systems in post-surgical outcomes. Data observed in American hospitals, for example, showed that post-surgical survival is higher in those services that recognize the most seriously ill patients early, despite the number of complications being similar between institutions [17].

Therefore, it can be concluded that improving outcomes depends mainly on two factors: recognition of patients at higher risk and early treatment of complications. Factors that may be related to the difficulty in recognizing and treating complications include the high volume of patients at increased risk, reduced nursing staff, communication failure and lack of risk escalation [17].

There are some algorithms that more practically measure the risk of complications and death in non-cardiac surgery, which may vary according to the patient's morbidities and clinical condition. To calculate the risk, data about the person are considered, such as age, physical fitness, history, physical examination of the patient, laboratory tests and the type of surgery they will undergo.

In most hospitals, as is the case at HC UFG, obtaining an operating room for emergency surgery depends on dialogue and negotiation. In others, emergency surgeries are performed on a first-come, first-served basis [18].

Recognizing failures during the preoperative patient care process is important for developing measures to optimize the outcome and reduce fragmentation of care.

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