



ORIGINALES

Incidences and Causes of Surgery Cancellation in a University Hospital in Barranquilla, Colombia, in 2016

Incidencias y causas de la cancelación de cirugía en un hospital universitario, Barranquilla, Colombia 2016

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ABSTRACT:

Introduction: Surgery is any procedure performed in the operating room that allows timely treatment of pathologies and injuries; in Colombia, an indicator of the quality of the information system is the proportion of scheduled surgery cancellations.

Materials and method: We designed a retrospective observational study, selecting all patients scheduled for surgery at the hospital institution from January 1, 2016 to December 31, 2016. A total of 3207 patients were included. We analyzed cases of surgery cancellations because of factors attributable to the patient, institution, and medical order.

Results: Of the 3207 scheduled procedures, 1739 (54.2%) were men and 1468 (45.8%) were women. Surgical procedures were scheduled for patients aged between 6 months and 116 years, with an average age of 38 years. Of the scheduled procedures, 244 (7.6%) surgeries were cancelled. The months with the lowest and highest incidences of surgery cancellation were August and November, with 9 (3.7%) and 36 (14.8%) cancellations, respectively. The cancellation rate for surgical specialties independently ranged from 1 (0.4%) for gynecology specialties of oncology, maxillofacial, and urology and 85 (34.8%) for orthopedics.

As the causes of cancellation, 93 (38.1%) were attributable to the institution, 99 (40.6) to patients, and 52 (21.3%) to medical orders.

Conclusions: In total, 41% of cancellations could have been avoided. We recommend continuous monitoring of scheduled patients, as well as the dissemination of our findings to professionals for the empowerment of responsibilities and the need for education for patients undergoing intervention.

Key words: surgery; surgical suspension; causes of cancellation.

RESUMEN:

Introducción: La cirugía es todo procedimiento realizado en quirófano que permite el tratamiento oportuno a patologías y traumatismos; en Colombia un indicador de calidad para el Sistema de Información de salud es la proporción de cancelación de cirugía programada.

Materiales y método: Diseñamos un estudio observacional retrospectivo, seleccionando todos los pacientes programados en la Institución Hospitalaria en el periodo de 1 enero 2016 a 31 diciembre de 2016. Un total de 3207 pacientes programados. Se analizaron las cancelaciones en factores atribuibles al paciente, institución y orden médica.

Resultados: De los 3207 procedimientos programados 1739 (54,2%) fueron hombres y 1468 (45,8%) mujeres, se programaron procedimientos quirúrgicos entre 6 meses y 116 años de edad, con un promedio de 38 años. Del total de programaciones 244 (7,6%) sufrieron cancelación de la cirugía, los meses con el menor y mayor incidencia de cancelación fue de agosto y noviembre con 9 (3,7%) y 36 (14,8%) respectivamente. La tasa de cancelación por especialidades médico quirúrgicas de manera independiente oscila entre 1 (0,4%) de las especialidades de ginecología oncológica, maxilofacial, urología y 85 (34,8%) de ortopedia.

Las causas de cancelación se clasificaron en atribuibles a la institución 93 casos (38,1%), al usuario 99 (40,6) y por orden médica 52 (21,3%).

Conclusiones: El 41% de las cancelaciones podrían haber sido evitadas. Recomendamos seguimiento continuo a los pacientes programados, además divulgación de estos estudios a profesionales para el empoderamiento de las responsabilidades y la necesidad de educación a los usuarios que serán intervenidos.

Palabras clave: Cirugía; Suspensión quirúrgica; Causas de cancelación.

INTRODUCTION

Patient safety is currently a worldwide public health concern. According to data from the World Health Organization (WHO), 1 in 300 patients suffers from harm caused by medical care compared with the likelihood of a passenger suffering harm on an airplane, which is one in every million passengers ⁽¹⁾.

The cancellation of scheduled surgeries is classified as one of the unsafe healthcare practices that can lead to adverse events, specifically including those factors related to resource management, such as lack of surgical supplies or equipment, lack of sterile clothing, or staff shortage. As emergency surgery replacement can also be provided⁽²⁾, WHO emphasizes that approximately 230 million major surgical procedures are performed worldwide every year, and it is estimated that investments in the surgical department make up 30.1% of the hospital's budget ⁽³⁾. Therefore, the cancellation of scheduled surgeries affects and determines the budgetary, labor, and medico-legal conflicts in the institution, thereby increasing costs and having a negative impact on patient care, particularly to those belonging to the most underprivileged section of the population ⁽⁴⁾. As a result, the service and its impact must be organized and optimized⁽⁵⁾.

In Colombia, Law 100 of 1993 established the General System of Social Security in Health (SGSSS) in order to declare health as a social right through the promotion, prevention, diagnosis, treatment, and rehabilitation of individuals who access the health system services. The first quality indicator for healthcare presented by the SGSSS in 2007 was the cancellation of scheduled surgeries, which represented a rate of 7.7% ⁽⁶⁾.

The Integrated System of Information in Health and Social Protection, in its quality indicators of Resolution 0256 of 2016, showed an indicator of surgery cancellation which, within the periods 2016-1 and 2016-2, showed an average of 3.62 and 0.92, respectively, at a national level; however, there are only reports from four institutions⁽⁷⁾.

According to the report from the Observatory for National Health Care Quality, the trend of the indicator for cancellation of scheduled surgeries showed a decrease of 1.8%, from 8.7% in the second half of 2006 to 6.9% in the first half of 2009 ⁽⁸⁾. It is estimated that approximately 60% of elective surgical cancellations were potentially avoidable if improved techniques were used ⁽⁹⁾.

Avoiding factors that lead to surgery cancellations obliges institutions to commit themselves to reduce those agents that affect pre-surgery arrangements, which may generate additional healthcare costs, costs derived from internal or external failures, and prevention and analysis costs. To achieve excellence, institutions must prove their efficiency and quality via continuous improvement, which results in a relationship of trust between the patient and institution as a result of the optimization of resources and extra work needed for the preparation of operating rooms ⁽⁹⁻¹¹⁾.

The objective of this research was to analyze the causes behind scheduled surgery cancellations in the university institution to allow surgeons, anesthesiologists, surgical instrument technicians, nurses, and administrators to introduce suitable measures to reduce the department's cancellation rate.

MATERIAL AND METHODS

We designed an observational study with a retrospective database. All patients scheduled for surgery at the University Hospital between January 1, 2016 and December 31, 2016, were included, with a total of 3207 patients.

A secondary data source of surgical planning was completed by the head of the institution's surgery department. For the study, sociodemographic variables (sex and age), and surgical procedure (scheduled month, surgical specialty, completion or cancellation of the procedure, and reason for cancellation) were evaluated.

This is a level 4 healthcare institution with surgical specialties and cutting-edge technology and infrastructure, with seven operating rooms for the development of scheduling, with interdisciplinary talent and anesthesia, cardiovascular, general surgery, oncology, pediatrics, plastic surgery, dermatology, gynecology, maxillofacial, nephrology, pneumology, ophthalmology, otorhinolaryngology, orthopedics, and urology specialties.

The surgical schedule is prepared on a daily basis at 5:00 pm for due organization and planning, and it is delivered to the department for the preparation of the hospitalized patient; for outpatients, surgeries are confirmed by telephone the day before surgery. Cancellation is defined as any scheduled surgical intervention that is not performed (scheduled and unperformed surgery)

The reasons for surgery cancellation were classified into three groups:

1. Failure of the institution: lack of authorizations by the Health Promoting Agencies (EPS), unavailable medical equipment, unavailable supplies, incomplete preoperative processes
2. Patient's reasons: rejection of the intervention, patient's non-attendance
3. Medical decision: health status, acute intercurrent illness

The data were analyzed in Microsoft Excel for statistical significance with a bivariate analysis using the Chi-square test and the statistical software SPSS, version 22.

RESULTS

Of the 3207 procedures scheduled, 1739 (54.2%) were surgeries for men and 1468 (45.8%) were for women. Surgical procedures were scheduled for patients aged between 6 months and 116 years old, with an average age of 38 years (standard deviation, 24).

Of the total scheduled interventions, 244 (7.6%) ended up being cancelled. The months with the lowest and highest incidences of cancellations were August and November, with 9 (3.7%) and 36 (14.8%) cancellations, respectively. Analysis of the distribution of surgical procedures performed and cancelled per month revealed statistically significant differences (chi-square = 58.71; $p < 0.000$) (Table 1).

Table 1. Percentage of surgery cancellations per month at Barranquilla in 2016

| Month | Surgery cancelled | Surgery performed | Total |
|----------|-------------------|-------------------|-------|
| January | 23 | 319 | 342 |
| | 9.4% | 10.8% | 10.7% |
| February | 21 | 372 | 393 |
| | 8.6% | 12.6% | 12.3% |
| March | 10 | 245 | 255 |
| | 4.1% | 8.3% | 8.0% |
| April | 11 | 287 | 298 |
| | 4.5% | 9.7% | 9.3% |
| May | 22 | 306 | 328 |
| | 9.0% | 10.3% | 10.2% |
| June | 18 | 290 | 308 |
| | 7.4% | 9.8% | 9.6% |
| July | 23 | 232 | 255 |
| | 9.4% | 7.8% | 8.0% |
| August | 9 | 189 | 198 |
| | 3.7% | 6.4% | 6.2% |

| | | | | |
|-----------|--------|--------|--|--------|
| September | 26 | 221 | | 247 |
| | 10.7% | 7.5% | | 7.7% |
| October | 23 | 185 | | 208 |
| | 9.4% | 6.2% | | 6.5% |
| November | 36 | 194 | | 230 |
| | 14.8% | 6.5% | | 7.2% |
| December | 22 | 123 | | 145 |
| | 9.0% | 4.2% | | 4.5% |
| Total | 244 | 2963 | | 3207 |
| | 100.0% | 100.0% | | 100.0% |

Analysis of the surgical specialties independently revealed varying cancellation rates, ranging from 1 (0.4%) for the oncology, gynecology, maxillofacial, and urology specialties and 85 (34.8%) for the orthopedics specialty. Analysis of the distribution of surgical procedures performed and cancelled by surgical specialty revealed statistically significant differences (chi-square = 534.93; $p < 0.000$) (Table 2).

Table 2. Percentage of surgery cancellations by surgical specialty in Barranquilla in 2016

| Specialty | Cancelled procedure | Procedure performed | Total |
|--------------------------|---------------------|---------------------|-------|
| Anesthesiology | 0 | 4 | 4 |
| | 0.0% | 0.1% | 0.1% |
| Cardiovascular surgery | 5 | 57 | 62 |
| | 2.0% | 1.9% | 1.9% |
| General surgery | 35 | 829 | 864 |
| | 14.3% | 28.0% | 26.9% |
| General oncology surgery | 0 | 6 | 6 |
| | 0.0% | 0.2% | 0.2% |
| Gynecologic | 1 | 26 | 27 |

| | | | |
|---------------------|-------|-------|-------|
| oncology surgery | 0.4% | 0.9% | 0.8% |
| Oncology surgery | 3 | 7 | 10 |
| | 1.2% | 0.2% | 0.3% |
| Pediatric surgery | 31 | 340 | 371 |
| | 12.7% | 11.5% | 11.6% |
| Plastic surgery | 36 | 481 | 517 |
| | 14.8% | 16.2% | 16.1% |
| Vascular surgery | 11 | 111 | 122 |
| | 4.5% | 3.7% | 3.8% |
| Dermatology | 0 | 4 | 4 |
| | 0.0% | 0.1% | 0.1% |
| Gynecology | 5 | 82 | 87 |
| | 2.0% | 2.8% | 2.7% |
| Maxillofacial | 1 | 26 | 27 |
| | 0.4% | 0.9% | 0.8% |
| Nephrology | 0 | 2 | 2 |
| | 0.0% | 0.1% | 0.1% |
| Pneumology | 5 | 41 | 46 |
| | 2.0% | 1.4% | 1.4% |
| Neurosurgery | 9 | 216 | 225 |
| | 3.7% | 7.3% | 7.0% |
| Ophthalmology | 5 | 20 | 25 |
| | 2.0% | 0.7% | 0.8% |
| Otorhinolaryngology | 11 | 168 | 179 |
| | 4.5% | 5.7% | 5.6% |

| | | | |
|-------------|--------|--------|--------|
| Orthopedics | 85 | 543 | 628 |
| | 34.8% | 18.3% | 19.6% |
| Urology | 1 | 0 | 1 |
| | 0.4% | 0.0% | 0.0% |
| Total | 244 | 2963 | 3207 |
| | 100.0% | 100.0% | 100.0% |

Among the reasons for surgery cancellation attributable to the institution, we found 93 (38.1%) cases in which the most common reasons were incapacity by the specialist, damaged equipment such as an image intensifier, bed unavailability in the intensive care unit, lack of hospital supplies for the procedure, and delay in the surgery schedule (Table 3).

Table 3. Reasons for surgery cancellation in Barranquilla in 2016

| Reason for Cancellation | Frequency | Percentage |
|-----------------------------------|-----------|------------|
| Attributable to the institution | 93 | 38.1% |
| Attributable to the patient | 99 | 40.6% |
| Attributable to the medical order | 52 | 21.3% |
| Total | 244 | 100.0% |

When reviewing the cancellation causes attributable to patients, we found 99 (40.6%) cases in which the patient's non-attendance and unsigned consent were very common.

Cancellation causes attributable to medical orders accounted for 52 of cases (21.3%), including cases of patients with high blood pressure, fever, vomiting, diarrhea, hyperglycemia, hypertension, and a patient who died before surgery.

The high cancellation rate of 28% (n = 70) in orthopedics was due to the absence or incompleteness of material.

When classifying cancellation causes into three groups based on the possible prevention thereof, we found that 101 (41%) cases of cancellation could be avoided with the participation of the institution, professionals, and external agents.

DISCUSSION

Surgery cancellation is a public health issue because of its impact both on the institutions' economy and on patients' psychological status. Various institutions, such as the Modernization Agency of the National Health Service ⁽⁸⁾, after an analysis of the causes, have issued recommendations regarding measures aimed at correcting surgery cancellation.

In a study conducted at the CMA ⁽⁹⁾, the primary cause for cancellation was the incorrect selection or preparation of the patient, which accounted for 27.1% of cases. Our study showed factors attributable to the institution resulting from doctors' incapacities, lack of supplies, and equipment damage. In 2013, 7.6% of cases were cancelled worldwide, and the three most frequent reasons for cancellation were those related to patients, facilities, and inadequate treatment ⁽¹⁰⁾.

A retrospective analysis of 8 years at an institution resulted in a reasonable cancellation rate of 3.66% within the world average ⁽¹¹⁾, while our cancellation rate was 7.6%. However, the study classified cancellations into those attributable to the patient, administrative, and medical causes, with a percentage of 26.8% for those attributable to administrative causes; while ours was 38.1%.

Administrative factors that were considered to be the main cause of surgery cancellations are indicative of the need to improve the organization and planning in this institution, and in the present study, those processes related to orthopedic procedures, which were the interventions that presented the highest rate of cancellation ⁽¹²⁾.

November and December showed the highest and lowest cancellation rates, respectively ⁽¹³⁾; in Brazil, surgery cancellation was 7.6%, with the lowest rate in December (4.3%), and the highest rate recorded in November (11.1%) ⁽¹⁴⁾. At our institution, November recorded the highest rate, while the lowest rate was recorded in August.

A study conducted in Australia showed 51 procedures cancelled on the day of surgery, in which 14.3% were due to the lack of surgical aptitude, followed by inadequate surgical time ⁽¹⁵⁾. However, in institutions that make a preoperative call 2 days before surgery and a weekly review of the surgery schedule, the cancellation rate was reduced from 3.8% to 3.5%. This strategy could improve the cancellation rate in the institutions of the region, thereby improving the surgical cancellation indicator. Cancellations related to the patient were reduced from 81% to 79.7%, while those attributable to the hospital were reduced from 17.5% to 15.9% ⁽¹⁶⁾.

During a period of 2 months across 13 specialties, a qualitative and prospective analysis was performed, which showed that cancellations occurred before the day of surgery and occurred because patients' health status was not optimal for the scheduled surgery or due to the lack of organizational resources ⁽¹⁷⁾, a situation in the

present study in which the factors were associated with the patient and administrative procedures.

An analysis of the efficiency of operating rooms conducted a measurement of procedures with indicators of surgery onset on time, percentage of cancellations, and average number of patients per day; these are indicators that refer to the quality of service. In the present study, although only the incidence of cancellation and causes⁽¹⁷⁾ were assessed, it is advisable to investigate the efficiency, costs, surgical times, and profitability of surgery services because, in addition to providing health services to the population, it is a profitable business.

Instead of applying the instrument to professionals, the results determined that 83% of the population surveyed had noticed the cancellation of surgeries in the departments; approximately 50% attended the surgery department and 33% in hospitalization. Other reasons for cancellation were 44% because of the institution's administrative staff, 12% because of the lack of interdisciplinary team management, 28% because of poor medical management, and 16% because of poor nursing management⁽³⁾.

Limitations of the study

We recognize that the records of the surgery book may underestimate the true rate of surgical cancellation and that the true causes of cancellation may not be recorded accurately, which constitutes a limitation of this study.

CONCLUSIONS

This study showed that the surgical cancellation rate of the hospital institution in 2016 was 7.6%. Regarding the causes for cancellation, the most frequent reasons were related to the specialty of orthopedics (34.8%), and those attributable to the patient accounted for 40.6%.

In total, 41% of cancellations could have been avoided by providing education to the patient and suitably planning procedures in which specialized surgical medical supplies are needed.

The results in this research indicate the need to provide training programs addressed to healthcare professionals who are a part of this process so that proper measures can be taken to improve the quality of the service, in addition to being a reference at the local level because such a study has not been conducted before.

We suggest conducting studies that address this issue in the city, department, and country, as well as the efficiency of the measures taken to reduce this quality indicator in health institutions.

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