Cancellations of Elective Surgeries on the Day of the Operation in a Portuguese Hospital: One Year Overview

Cancelamentos de Cirurgias Eletivas no Próprio Dia da Operação num Hospital Português: Um Ano em Perspetiva

ARTIGO ORIGINAL

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Acta Med Port 2021 Feb;34(2):103-110 ▪ https://doi.org/10.20344/amp.13437

ABSTRACT

Introduction: Cancellations of elective operations on the day of the surgery reflect the efficiency and quality within organisations, and have a significant clinical, social and economic impact, not only for the patient and their families, but also for healthcare institutions. This study assesses the extent of these cancellations in one public Portuguese hospital, through case quantification and identification of the causes, origin, as well as its predictability according to the sociodemographic variables of the patient and interventions used to decrease it.

Material and Methods: Non-experimental descriptive quantitative methodology – longitudinal and retrospective – of operation cancellation cases on the day of the surgery, from the 1st of January to the 31st of December 2018.

Results: The rate of cancellations of elective surgeries on the same day of the operation was 2.9% with variations among different surgical specialties; cancelled operations are more frequent in female patients, in patients aged between 50 and 80 years old, physical status classified as II or III according to the American Society of Anesthesiology, and without anaesthetic pre assessment or preoperative consultations; the three most relevant causes for cancellations are: lack of operative time, scarcity of beds and/or medical equipment, and changes in health status; most of which can be avoided and are the responsibility of the institution.

Discussion: Different reasons for cancellation of elective operations reflect a variety of upstream and downstream processes causing cancellation of surgeries and whose origin/imputability is related to both the institution and patients.

Conclusion: The rate of cancellations of elective surgeries on the same day of the operation is relatively low, but the causes are often preventable, thus justifying the generalization of cancellation reduction strategies.

Keywords: Appointments and Schedules; Clinical Governance; Efficiency, Organizational; Elective Surgical Procedures/statistics & numerical data; Health Quality; Hospital Administration; Operating Rooms/organization & administration; Portugal; Utilization Review

RESUMO

Introdução: Os cancelamentos de cirurgias eletivas que ocorrem no próprio dia da cirurgia acarretam importantes consequências clínicas, sociais e económicas, individuais e familiares, mas também institucionais, e refletem processos de eficiência e qualidade das organizações. Este estudo pretende avaliar a dimensão dos cancelamentos no dia da cirurgia numa instituição do Serviço Nacional de Saúde, quantificando-os, identificando as causas, origem e previsibilidade, na relação com variáveis sociodemográficas e intervenções dedicadas à sua redução.

Material e Métodos: Metodologia quantitativa descritiva, de abordagem não experimental, longitudinal e de dimensão temporal retrospetiva, relativa aos episódios com cancelamentos cirúrgicos no dia da cirurgia, decorridos no período compreendido entre 1 de janeiro e 31 de dezembro de 2018.

Resultados: A taxa de cancelamento no próprio dia foi de 2,9%, variando entre as especialidades cirúrgicas, maioritariamente em doentes do sexo feminino, na faixa etária dos 50 aos 80 anos, com estado físico II ou III, segundo a American Society of Anestesiology, e sem consulta pré-anestésica ou pré-operatória prévias; as três causas de cancelamentos mais evidentes são: a falta de tempo operatório, a falta de camas e/ou materiais e a alteração do estado de saúde, a maioria das quais evitáveis e imputáveis à instituição.

Discussão: Os múltiplos motivos de cancelamento refletem uma variedade de processos a montante e a jusante, que culminam no cancelamento cirúrgico, e cuja a origem/imputabilidade se dispersa entre a instituição e o próprio doente.

Conclusão: A taxa de cancelamento de cirurgias eletivas no próprio dia da operação é relativamente baixa, mas as causas são frequentemente evitáveis, justificando a generalização de estratégias de redução dos cancelamentos.

Palavras-chave: Agendamento e Marcações; Eficiência Organizacional; Portugal; Procedimentos Cirúrgicos Electivos/estatística & dados numéricos; Revisão da Utilização; Salas Cirúrgicas/organização e administração

INTRODUCTION

Health was classically described by the World Health Organization (WHO)[1] as a state of complete physical, social and mental well-being and is not only restricted to the absence of disease, in a concept as comprehensive and positive as it is utopian. Healthcare is one of the determinants of health, directly limited by healthcare institutions,[2] with specificities of organisational management, leadership and control, depending on the intrinsic failures of the healthcare market, making it more difficult to achieve a balanced economic efficiency.[3,4]

The increase in demand for surgical care related to demographic changes has induced the reformulation of policies focused on the balance between surgical demand and supply, through response criteria in clinically acceptable

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Recebido: 14 de janeiro de 2020 - **Aceite:** 27 de julho de 2020 - ***Online issue published:*** 01 de fevereiro de 2021

times. In Portugal, strategies to improve access to surgical care were developed and were included into the Integrated Surgical Register Management System (*Sistema Integrado de Gestão de Inscritos para Cirurgia* - SIGIC), which is aimed at the integrated, continuous and universal management of patients registered for surgery.[5,6] The SIGIC was later incorporated into the Integrated Access Management System (*Sistema Integrado de Gestão do Acesso*) due to legislative changes, namely the principle of free access and circulation within the National Health Service (NHS).[7]

With the SIGIC, all surgical proposals are registered into the (*Sistema de Informação Hospitalar* - SIH) and with an ensured maximum response time (*tempo máximo de resposta garantido* - TMRG), according to priority criteria, into a bureaucratic process including intermediate clinical and administrative sub-processes, such as patient registration, contact and scheduling. Surgical performance also includes several procedures related to patient admission and all events performed during the perioperative period.[8]

Same-day surgical cancellation, regardless of the reason, is usually defined as any cancellation occurring within 24 hours of the scheduled date or after posting of a previously generated surgical list (usually late morning of the previous day) that was not performed.[9-17]

Same-day surgical cancellations are particularly important for the patients, society, policy-makers and hospital administrations and reflect failures in some of the steps of the process chain up to a surgical intervention, with clinical, social, economic and organisational outcomes. Submission to a surgical procedure is a time of emotional and biological stress for the patients, involving periods of personal and family lack of attendance at work, with high individual and social costs. In fact, any surgical cancellation may change the health outcomes themselves, reducing satisfaction, increasing waiting times or hospitalisation, causing anxiety, worsening of pain and potentially decompensated conditions, with implications in recovery and even mortality.[18] When it occurs on the same day of surgery, cancellation involves the double penalty of preventing from rescheduling a new patient in due time for the period now available, with operational and financial costs for the institution, underutilisation of operating rooms (OR) and waste of specialised human resources, materials and equipment, with an impact on the productivity and (in)efficiency of the institution, leading to a double burden within a free access setting.[19-21]

Four major reasons for cancellation are defined by the SIGIC[5] tutorial:

1. Patient-related cancellation due to non-clinical reasons (refusal with/without a reasonable reason, no show with/without reasonable reason, withdrawal or unreachable patient);
2. Clinical reasons (death or other clinical reasons);
3. Hospital-related (lack of response at the operating room (OR) or the wards, administrative error, lack of intervention capacity (transfer due to exceeding the TMRG), among others);
4. Third party responsibility (the patient was operated in another institution, hospital worker's strikes, etc.).

The reasons for cancellation are more specific and refined in the SIH, usually available at the Information System for Hospital Patient Management (*Sistema de Informação para a Gestão de Pacientes Hospitalares* - SONHO), although they still maintain considerable redundancy. When a cancellation occurs, the reason is usually administratively recorded in SONHO and often on (manual or digital) record sheets, allowing for an easier analysis by OR/surgical department management and hospital administration.

The cancellation of a scheduled surgery is often multifactorial, with many interrelated causes and no standardised coding, making the analysis and refinement of this subject much more difficult. A systematic review[20] on same-day surgical cancellations validated the perceived mutability of rates between different studies, including significant variations between hospitals of similar size and with the same profile. This may be explained by variables such as hospital typology and size (differentiation, university status), study methodology (grouped reasons for cancellation) and different health systems and policies, in addition to specific variables, such as surgical specialty, OR management model (extended or fixed scheduling) and the presence of cancellation minimisation procedures, including timely pre-anaesthesia and pre-operative assessments. A comparative retrospective study by Schuster[13] has reached the conclusion that substantially higher cancellation rates were found in university hospitals and in general surgery. Variable rates have been described in different countries, including China (< 1%), United States of America (USA) (2-12%), United Kingdom (5-14%), Spain (7%), Hong Kong (8%), Canada (10%), Australia (12%) and India (17%).

In a study by Al Talawah,[20] reasons for cancellation were ranked according to predictability, with evidence suggesting that reasons were mostly avoidable (86.5%) and due to institutional causes (≥ 80%), including lack of OR time (most frequent reason, ranging from 17.5% to 78%), shortage of ward beds and/or equipment (from 0.5% to 28%), staffing shortage (2% to 26%) and inappropriate surgical proposal (1.2% to 7.6%). Patient-related causes include no-shows (20% to 60%, depending on the study), patient refusal (3.8% to 6.8%), change in patient's clinical status (17.5%) and inadequate patient preparation (from 2.1% to 20%). Causes related to physicians were also defined by the same author, such as surgeon-related (2.6% to 41%), anaesthesia-related (up to 36.4%) and overbooking (excess of patients in the operative list, reaching up to 74% of the reasons for cancellation, due to the surgeon who was responsible for its preparation).

The different reasons were grouped by Schuster[13] into administrative/patient-related (14.2%, including no-show as the most frequent reason - 6.8%), medical (38.4%), including change in patient's clinical status and inadequate patient preparation, and institutional (41%), including overbooking as the leading reason - 23.2%. These groups of reasons reflect the variability among surgical specialties. In fact, both this author and Al Talawah,[20] in line with other authors, have

reached the conclusion that most causes are institutional.

In Portugal, the absence of a standardised record of cancellations scatters data across different information systems, with subsequent subjectivity of the reason classifications. Access to information regarding cancellations per institution and nationwide was previously requested to the Central Administration of the Health System (ACSS), having reported that these data are no longer subject to analysis. Even so, the latest public data suggest overall same-day cancellation rates of around 12%, suggesting a sustained reduction over the study period.[22]

Quality in care delivery is shown by elective surgeries performed on the scheduled date and time and complying with all safety conditions, with an impact on different indicators, including mean waiting time and pre-operative length of stay, mean hospital delay and OR utilisation rate.[19] These indicators are a valuable strategic resource for continuous improvement, reflecting the effectiveness and efficiency of the OR.[23]

This study was aimed to answering a core question - "what is the real dimension of same-day surgical cancellations in a public institution?" - and was carried out at a public hospital ranked within group C of the ACSS benchmarking and following a functional organisational structure. There are eight operating rooms in the institution aimed at elective surgery, with a 08:00 – 20:00 fixed scheduling, including a ten-bed post-anaesthesia care unit (PACU) and performing about 400 elective conventional surgical procedures per month within the following specialties: general surgery, plastic surgery, orthopaedics, otorhinolaryngology (ENT), ophthalmology (OPHT), urology, dental medicine and oral & maxillofacial surgery.

This study was mainly aimed at the assessment of same-day surgical cancellations in conventional surgery.

Other specific objectives of the study were also included:

a) Rate of same-day cancellations;
b) Identification of the reasons for cancellations;
c) Identification of the origin and predictability of surgical cancellations;
d) Comparison of the causes of surgical cancellations with socio-demographic variables, surgical specialties and interventions/procedures to reduce cancellations.

MATERIAL AND METHODS

A study design covering and organising the necessary operational actions and controlling any sources of bias must be followed.[24] A non-experimental approach was used, focused on data collection and description of same-day cancellations, with no manipulation of the independent variable. The research was developed as a quantitative and retrospective approach, with systematic collection of numeric data, submitted to analysis by using longitudinal descriptive statistical procedures.

Episodes corresponding to elective surgical cancellations from 1 January 2018 to 31 December 2018 were considered as study population, provided that these had happened within the 24 hours prior to the time of scheduling and involving patients registered at an outpatient setting (or similar), according to the rules established in the SIGIC. The following were therefore excluded from the study:

- Episodes related to conventional surgery involving patients registered at an inpatient setting (hard-to-reach information[25] and with no formal preoperative assessment);
- Outpatient, emergent and conventional surgery episodes in paediatric surgery and obstetrics, due to the specific characteristics of these patients (namely the high prevalence of cancellations in paediatric population,[15,20] as well as the expected absence of cancellation in elective obstetric procedures, namely regarding elective C-sections).

This methodology was aimed to reflect the complete SIGIC procedure, including its different sub-processes and to approach conventional surgery cancellations, usually less studied when compared to outpatient surgery. Easier data collection and the size of the study population made it possible to consider the entire population, without the need to use sampling techniques.

The list of surgical cancellations having occurred after the surgical scheduling forms had been issued (within the previous 24 hours) was obtained from the SONHO programme, in collaboration with the Information Technology (IT) and Knowledge Support departments of the institution. When required, administrative data from the SClinico® programme and administrative, as well as OR scheduling spreadsheets filled daily by the nursing team were obtained.

The different causes of cancellations obtained from the SONHO, refined by data from the electronic medical record and operating room scheduling spreadsheets, were classified as avoidable or non-avoidable, institutional or patient-related, according to the reason for cancellation, based on the consensus found in literature and by multiple agreement between the authors and the clinical board of the OR. The actual causes were subsequently grouped into seven groups of reasons, by consensus:

- Inadequate patient preparation;
- Shortage of material, equipment and/or ward beds;
- No-show / patient refusal;
- Staff shortage;
- Lack of OR time;
- Change in patient's clinical status;
- Hospital worker's strikes.

The data regarding the number of episodes was based on the following variables:

- Socio-demographic characteristics of the patients (gender and age group);
- Reason for cancellation;
- Surgical speciality;
- Classification of physical status according to the American Society of Anesthesiologists (ASA);
- Pre-anaesthesia assessment (within six months prior to the scheduled appointment date, which is

considered as valid by the ASA) and preoperative assessment by the surgical specialty (up to one month prior to the scheduled appointment date).

After validation, the database was exported from Excel® to SPSS® and descriptive (frequency distribution) and inference (independence tests and association measures) data analysis was carried out.

Pearson's chi-square test of independence was used with Yates's correction and Monte Carlo simulation, whenever appropriate, for the statistical analysis of inference and crossover between nominal variables.[25] Adjusted residuals (AR) were used to measure the impact of independence rule failure in the application of both tests and Cramer's V to evaluate the intensity of association in the analysis of nominal variables.[26]

The applicable ethical standards were strictly met throughout the study. After application, including a detailed description of the scope, objectives and methodology of the study and upon the positive and corrective advices of the Ethics Committee and the Local Committee for Personal Data Protection of the hospital, the study was approved by the Executive Board.

RESULTS

A total of 3,756 elective conventional surgeries were scheduled within the period from 1 January to 31 December 2018 and according to the inclusion criteria, 112 (2.98%) from which were cancelled on the same day. Ophthalmology (44.68%), dental medicine (8.11%) and orthopaedics (3.14%) showed the highest cancellation rates while plastic surgery showed the lowest (1.40%) (Table 1).

Most cancellation episodes corresponded to female patients (58.04%) aged 50 to 65 years (34.82%) and ASA grade 2 (51.79%); the last quarter of the year showed the highest number of cancellations, with October being the month with the highest prevalence of cancellations. When considering the three leading specialties in total number of patients (general surgery, orthopaedics and urology; combined value above 66%), there is no significant association (AR < 2) between specialties and gender, ASA status or age group (Table 2).

When grouped, the most frequent reasons for cancellation included "lack of OR time" (31%), "shortage of material, equipment and/or hospital bed" (19%) and "change in patient's clinical status" (19%) (Table 3).

A variable distribution has been found within each specialty (Table 4). The grouped causes were globally specialty-related, showing statistical significance ($p < 0.05$). Using the adjusted residuals (AR), there is a greater association between:

- General surgery ↔ lack of OR time (AR = 4);
- Gynaecology ↔ change in patient's clinical status (AR = 3.3);
- Ophthalmology ↔ inadequate patient preparation (AR = 3);
- Orthopaedics ↔ lack of OR time (AR = 2.5) and shortage of material, equipment and/or hospital bed (AR = 2.4).

Approximately 58% of the cancellations were considered as potentially avoidable, with a mild overall association with attending a pre-anaesthesia assessment (Cramer's V = 0.18). Approximately 79% of the reasons for same-day cancellations were originated from the institution itself and there is statistical significance ($p < 0.05$) of a variable imputability of the cause according to the specialty [strongest association with gynaecology (AR = 3.8)].

In this population, 57% of the episodes regarded non-attendance at pre-anaesthesia assessment and 83% of the

Table 1 – Scheduled surgeries and same day cancellations, per specialty

Specialty	Scheduled surgeries	Same day cancellations	Rate of same day cancellations
General surgery	1,011	25	2.27%
Dental medicine	37	3	8.11%
Plastic surgery	143	2	1.40%
Gynaecology	268	8	2.99%
Ophthalmology	47	21	44.68%
ENT/Otorhinolaryngology	264	4	1.52%
Orthopaedics	1,083	34	3.14%
Urology	813	15	1.85%
Total	3,756	112	2.98%

Table 2 – Distribution of the sociodemographic characteristics within the three leading specialties in number of patients

		Gender		Age group					ASA			
		♀	♂	≤ 35 years	]35; 50]	]50; 65]	]65; 80]	> 80 years	I	II	III	IV
Specialty	**General Surgery**	7	18	4	2	9	7	3	4	11	9	1
	Orthopaedics	17	17	1	5	7	13	8	3	17	11	3
	Urology	10	5	0	4	5	5	1	3	7	5	0

episodes did not include a pre-operative assessment within one month before the scheduling date. There is statistical evidence ($p < 0.05$) that attending a pre-anaesthesia and pre-operative assessment is overall dependent on the specialty:

- Ophthalmology is negatively associated with attending pre-anaesthesia (AR = -4.4) and pre-operative (AR = -2.3) assessments;
- Orthopaedics is negatively associated with attending pre-operative assessment (AR = -3.2);
- General surgery is positively associated with attending pre-anaesthesia (AR = 3.3) and pre-operative assessment (AR = 8.3).

A positive association was also found between "lack of OR time" and non-attendance at pre-anaesthesia (AR = 2.1) and pre-operative assessment (AR = 3.3).

When comparing the attendance at pre-anaesthesia and preoperative assessment in the study population with the whole elective surgeries (excluding 'hospital worker's strike' reason) (Table 5) the following was found:

- There is statistical evidence that cancellation is dependent on attending pre-anaesthesia assessment ($p < 0.01$);
- There is statistical evidence that cancellation is dependent on attending pre-operative assessment ($p < 0.05$).

The absence of pre-anaesthesia and pre-operative assessment is associated with odds of cancellation [95% confidence interval (CI)] of 2.3 (1.53; 3.38) and 1.8 (1.10; 3.03), respectively.

DISCUSSION

Classically, cancellation rates were highly variable between institutions, reflecting different healthcare systems, OR management models and hospital typologies. A reduced overall rate has been found in this institution with postgraduate teaching structure and a fixed OR schedule, when compared to hospitals of similar typology in similar healthcare systems,[15,27] more in line with private hospitals with smaller size and with extendable OR schedules,[14,28] which could be explained by the exclusion criteria of the study population.

Cancellation rates were variable among the surgical specialties even though the administrative scheduling

Table 3 – Aggregated reasons for same day cancellations

Aggregated reason	No. of cases	% of cancellations (95% CI*)
Lack of OR time	35	31.2% (22.8% - 40.7%)
OR material shortage or lack of ward bed	21	18.8% (12% - 27.2%)
Change in patient's clinical status	21	18.8% (12% - 27.2%)
Inadequate patient preparation	18	16.1% (9.8% - 24.2%)
Hospital worker's strike	12	10.7% (5.7% - 18%)
Patient refusal	3	2.7% (0.6% - 7.6%)
Staffing shortage	2	1.8% (0.2% - 6.3%)

* CI: confidence interval

Table 4 – Aggregated reasons for cancellation, per specialty

		Specialty								
		Gen. surgery	Plastic surgery	Dental Med	Gynaecology	OPHTH	ENT	Orthopaedics	Urology	Total
Aggregated reasons	Staffing shortage	0	0	0	0	0	0	2	0	2
	Material shortage or lack of ward bed	4	0	1	0	1	0	**11**	4	21
	Lack of OR time	**16**	**2**	**2**	2	1	1	5	**6**	35
	Inadequate patient preparation	3	0	0	0	8	0	4	3	18
	Patient refusal	0	0	0	1	0	0	2	0	3
	Change in patients clinical status	2	0	0	**5**	2	**2**	8	2	21
	Hospital worker's strikes	0	0	0	0	**9**	1	2	0	12
	Total	25	2	3	8	21	4	34	18	112

processes are relatively similar (with the exception of ophthalmology, considering a 44.68% outlier, apparently due to hospital worker's strikes). The association between non-attendance at pre-anaesthesia and pre-operative assessments and cancellation in different specialties is worth mentioning, which was stronger regarding ophthalmology, orthopaedics and general surgery and therefore non-attendance at these assessments had an impact on the cancellation rate, in line with previous studies.[29,30] Different patient approaches occur in pre-anaesthesia assessments, including the evaluation of the patient's functional health status and perioperative needs, reducing causes such as lack of OR time (association found in this study), inadequate patient preparation, shortage of hospital beds (in differentiated units) and change in patient's clinical status; pre-operative assessment, when carried out by the attending surgeon, allowed a reduction in no-shows, shortage of material and lack of OR time (association found in this study) and could prevent any inadequate planning (overbooking).[31-33]

The reasons found in the study reflect the prevalence of overbooking in OR plans, shown by the lack of OR time, when excluding unpredictable causes such as unexpected delay in the previous surgery or OR occupation by an emergency - from the 35 episodes regarding lack of OR time, 23 were considered due to overbooking, which is considered as the specific reason for the highest number of cancellations (and more significantly associated to general surgery and orthopaedics). Overbooking is in itself multifactorial and can be expressed by poorly designed operative plans and impaired communication between teams, when all the required OR times were not incorporated (including anaesthesia techniques and OR turnover) and inadequate surgical proposals. Overbooking is generally avoidable and is related to non-attendance at pre-anaesthesia and pre-operative assessments.[13,30,34-36]

More than half of the cancellations were considered as avoidable and although this figure is in line with the international literature, it should be analysed, especially as regards the ability to be improved. Apart from overbooking, different other causes related to inadequate preparation and are due to poor communication within the teams and with the patients, in addition to the shortage of material or hospital beds, are mostly susceptible to intervention strategies.[14]

Shortage of material and equipment are mostly predictable reasons, including the lack of requisition or specification in the operative programmes, unavailable material in due time and in loco and are frequent issues in specialties with high material turnover (orthopaedics). The lack of ward beds is a more comprehensive issue due to the lack of a postoperative bed at a differentiated unit (usually predictable) and the lack of a ward bed, usually more frequent in specialties such as general surgery or urology, according to the patient profile.[37] The management of the shortage of ward beds is a challenging issue due to a multifactorial origin, which depends not only on inpatient clinical management in the different surgical departments (and also in medicine departments), as well as on the social responses, including hospital bed availability downstream.

Inadequate patient preparation relates to changes in the underlying pathology, with implications in the surgical technique, or when certain preoperative recommendations were not transmitted (or reinforced) to patients; both situations regard inadequate communication between physicians and patients. These frequently occur when the patient's registration is not made by the attending surgeon (frequent in ophthalmology) and are related to the time that elapses from the registration to the date of scheduling.

Patient no-shows on the day of the surgery were virtually negligible in this study, in clear contrast with recent literature in countries with a similar system.[15,38] No-shows are multifactorial and often depend on the quality and frequency of contacts between the institution and the patients.[28,30] Although a small rate of attendance at pre-operative and pre-anaesthesia assessments (protective factors of cancellations and corresponding to communication proximity with the patients) has been found in this population, it is speculated that the low rate of cancellations due to no-show is due to socioeconomic factors, whose temporal delimitation follows the same pattern as described in literature (greater no-show prevalence in October).

Changes in patient's clinical status is an aggregate reason that derives from the refining of multiple reasons inserted in the SONHO programme. It is usually due to changes related to comorbidities or new medical conditions inducing a postponement or even cancellation of the surgical appointment. Although unpredictable, these are minimised by reducing the period between registration and surgery and by their early recognition through previous contact with the patients, either scheduling pre-anaesthesia or pre-operative assessments closer to the date of surgery or by contact with the patients on the eve of the surgery, as mentioned above.[29-31,33]

Table 5 – Pre-anaesthesia and preoperative assessments

		Cancelled	Completed	Total
Pre-anaesthesia assessment	Yes	45(*)	2,368	2,413
	No	55(*)	1,276	1,331
	Total	100(*)	3,644	3,744
Pre-operative assessment	Yes	19(*)	1,093	1,112
	No	81(*)	2,551	2,632
	Total	100(*)	3,644	3,744

(*) The cases that were cancelled due to 'strikes' were excluded

This study was carried out at a single public hospital and included a small group of episodes, even though covering a one-year period and could not be generalisable to the national universe. However, it was intended to reflect the episodes that followed the classic SIGIC administrative processes; in addition, after finding incomplete data when applied to a longer time period, the authors understood that this extension would not add any value. Further studies in other similar settings, following the same methodology, would be relevant to obtain a better definition of the subject, from a national but also regional perspective.

On the other hand, it is unanimous that the distribution of the reasons for surgical cancellation is highly variable in literature and usually depends on the methodology of the studies, including the classification that has been used. There is a certain variability in the terminology related to the real causes, with limitations of scope in the SIH coding and some subjectivity in the cancellation forms filled in by the nursing team. Even so, we aimed at achieving the greatest possible consensus in the definition of cancellations and their reasons, based on a comprehensive literature and multiple agreements between the authors and OR management (when applicable).

The assessment of the subject in this institution would benefit from further application of root cause analysis frameworks for each of the different reasons, allowing the identification of critical moments in the different processes and the implementation of strategies aimed at each of these. On the other hand, it would be important to use the qualitative methodology in interviews / focus groups, allowing to understand the relationships between the different role players in the surgical process and how these interfere with the observed outcomes.

CONCLUSION

Same-day surgical cancellations are due to weaknesses within different administrative, clinical and organisational processes. A relatively small rate of cancellations has been found in this hospital and regarding the episodes of conventional surgery included in the study, showing variations between the different surgical specialties, mostly avoidable and due to institutional-related reasons. The most common reasons for cancellation included the lack of operative time, lack of material/equipment or ward beds and changes in patient's clinical status.

This study highlights the importance of interventions to minimise surgical cancellations, namely attending pre-anaesthesia and preoperative assessments. On the other hand, the need for management and quality improvement in administrative and teamwork processes is emphasized, reducing the most common causes of cancellation, particularly overbooking and the shortage of ward beds.

HUMAN AND ANIMAL PROTECTION

The authors declare that this project complied with the regulations that were established by the Ethics and Clinical Research Committee, according to the 2013 update of the 466/12 Resolution of the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

CONFLICTS OF INTEREST

The authors declare that there were no conflicts of interest in writing this manuscript.

FINANCIAL SUPPORT

The authors declare that there was no public or private financial support in writing this manuscript.

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