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Cancellation of elective surgical procedures in the university teaching hospital center Yalgado Ouedraogo in Burkina Faso: incidence, reasons and proposals for improvement

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Background: Cancellation of scheduled surgery leads to operating theatre under-occupancy and is recognised as a major cause of emotional trauma to patients and their families. This study aimed to assess the incidence of elective surgery cancellation in order to make proposals for healthcare improvement.

Methods: A prospective study was undertaken on cancellation of scheduled surgery in the general surgery service. Cancellation is considered to have occurred when planned surgery did not take place on the day it was scheduled and recognised as 'final' when it was no longer considered at a later date. Cancellations were classed as 'avoidable' or 'unavoidable'.

Results: A total of 103 surgeries were scheduled for patients with an average age of 41.1 years. Abdominal surgery (36.9%) dominated and 63.1% ($n = 65$) of the operations were scheduled. Some 36.9% ($n = 38$) of interventions were delayed, of which 9.7% ($n = 10$) were definitively cancelled and 27.2% ($n = 28$) were carried forward. Half of the cancellations (47.4%) were related to equipment and 31.6% related to patient factors. Hospital-related cancellation accounted for 63.9%. Cancellation was avoidable in 68.5% of cases. A financial cause was relevant for 16.6% ($n = 6$) and 2.6% of cancellations were due to a 'long preceding intervention'.

Conclusion: The impact of cancellation is high and better organisation and communication between relevant role players within the operating theatre should reduce unnecessary cancellation.

Keywords: cancellation, elective surgery, operating theatre

Introduction

In a hospital, the operating theatre (OT) is considered to be the heart of the technical platform.¹ OT activities require significant material and human resources.² Hospital managers allocate 10–15% of the total hospital budget to the OT.^{3,4} A well planned operating schedule is the cornerstone of the organisation and is therefore very important for all of the hospital activities. Determining the cancellation rate of scheduled surgeries is an important standard of care quality and management assessment. The incidence of postponed elective surgery varies from 10% to 40%.^{2,5,6} There are multiple causes which vary from one hospital to another.⁷ Some are avoidable but others are not.² In Australia, 86.5% of carryover causes were predictable.⁸ The postponement of surgery is a source of anxiety, expense and increased mortality and morbidity. The aim of this study was to evaluate the incidence of and reasons for surgery cancellation in the general and abdominal adult surgery department of Yalgado Ouedraogo University Hospital Center (YOUHC) and to find appropriate solutions for improvement patient care.

Patients and methods

This was a three-month prospective hospital-based study conducted in the teaching hospital at YOUHC from April 30, 2012 to July 30, 2012. YOUHC is the tertiary referral and teaching hospital of Ouagadougou University College of Health Sciences. The hospital has many operating theatres (OTs), each of which has one to three rooms. These rooms are used for general or other

surgery. Our study was approved by the local ethics committee. All patients scheduled for elective surgery were included. Social and demographic characteristics, type of surgery and reasons for cancellation were assessed. Data sources included patients, the registry of the OTs and members of staff of the Department of Surgery and logistics services. The scheduled operating programme was obtained on the preceding day. This programme contains information such as the patient's identity, names of the surgeon and anaesthetist, type of surgery and OT number. When the surgical procedure was completed, various data on the timing of the operation were obtained from the anaesthesia record. Cancellation was defined as any surgery scheduled on a given date that did not occur on that date. It was considered a 'final cancellation' when it was not rescheduled for a later date. The causes of cancellation were classified as avoidable (no operating room, no room for postoperative care, mistakes in patient identity, administrative causes, materials and transport problems, lack of communication, unwilling patient, surgeon not available) or unavoidable (cancellation by the patient him/herself, medically justified, emergency priority). Data were analysed using Epi Info™ software version 3.5 (CDC, Atlanta, GA, USA).

Results

One hundred and three patients were included in this study. The average patient age was 41.1 years (95% CI 15–87). Digestive disease (36.9%) and outpatients (72.8%) represented the majority (Table 1).

Table 1: Patient characteristics (n = 103)

General data		Mean (SD)	No.	%
Age (years)		41 ± 12		
Gender	Female/male		58/45	56.31/44.69
Job	Housewife		36	35
	Farmer		13	13
	Civil servant		10	10
	Retired		2	2
	Pupil/student		14	14
	Trading		18	18
	Others*		8	8
Patient income	Low		33	32
	Medium		67	65
	High		3	3
Hospital stay	Inpatient/outpatient		28 /75	27.2/72.8
Surgery by type	Digestive		38	36.9
	Thyroid		5	4.9
	Venous/arterial stent		8	7.8
	Gynaecology		12	11.7
	Urology		5	4.9
	Bone		4	3.9
	Abdominal wall		23	22.3
	Dermatology		9	8.7

*Drivers (3); hairdressers (1); mason (4).

Table 2: Scheduled surgery and cancellations according to demographic data (n = 103)

Demographic data		No. of patients scheduled	No. of patients	Surgery at first appointment, n (%)	No. of cancellations, n (%)
Age	[15–19]	6	4	(66.6)	2 (33.3)
	[20–29]	12	9	(75)	3 (25)
	[30–39]	21	9	(42.8)	10 (47.6)
	[40–49]	18	11	(61.1)	5 (27.7)
	[50–59]	26	18	(69.2)	4 (15.4)
	[60–69]	9	7	(77.7)	1 (11.1)
	> 70	11	7	(63.6)	3 (27.2)
Gender	Male	58	38	(65.5)	14 (24.1)
	Female	45	27	(60)	14 (31.1)
Income	Low	33	21	(63.6)	9 (27.2)
	Medium	67	41	(61.20)	19 (28.35)
	High	3	3	(100)	–
Residence	Ouagadougou	67	44	(65.6)	17 (25.37)
	Outside Ouagadougou	36	21	(58.3)	11 (30.55)

In total, 63.1% (n = 65) had their scheduled surgery as planned. The scheduled surgery and cancellations are shown according to demographic characteristics in Table 2.

Thirty-eight programmed surgical interventions were cancelled (36.9%) including 10 final cancellations (9.7%) with 28 cases postponed (27.1%). Cancellations were related to equipment

(47.4%), patients (31.6%) or caregivers (15.8%) (see Table 3). 2.8% of cancellations were due to a long preceding surgical procedure. Surgery was delayed once (82.1%), twice (14.3%) or three times (3.6%) for some patients.

The incidence and reasons for surgical cancellations according to the literature are presented in Table 4.

Table 3: Causes of cancellation on the day of intended surgery (n = 38)

Causes related to		No.	Specific causes (%)	Percentage of cancellations
Patient	Absence	3	25	7.9
	PAA* not carried out	2	16.6	5.3
	Intercurrent disease	3	25	7.9
	Financial problem	4	33.3	16.21
	Sub-total patient factors	12	100	31.6
Material	No available sterile materials	14	77.7	36.9
	Monitor broken down	2	11.1	5.3
	Power failure	2	11.11	5.4
	Sub-total materials	18	100	47.4
Caregivers	Blood not reserved	2	66.6	10.6
	Unavailability of the surgeon	1	16.66	2.6
	Patient not informed	2	33.33	5.26
	Long preceding surgical operation	1	2.8	2.6
	Sub-total caregivers	6	100	15.7
Other	Cardiorespiratory arrest	1	50	2.6
	Histology revealed cancer	1	50	2.6
	Sub-total other	2	100	5.3
Total		38		36.9

*PAA = preanaesthetic assessment.

Table 4: Comparison of incidence and reasons for surgery cancellation according to the literature

Authors	Journal	Design	Rate (%)	Reasons for cancellation			
				Patient (%)	Administrative (%)	Surgeon (%)	Anaesthetist, medical or material problem (%)
Present study	–	P	36.9	31.6	48.1	15.8	4.5
Ojo and Ihezue ⁶	East and Central African J Surgery	P	28.5	57.3	40.3	2.4	–
Kumar and Gandhi ¹³	J Anaesthesiol Clinical Pharmacology	P	17.6	21.1	63	1.2	11.6
Chiu <i>et al.</i> ¹⁵	Hong Kong Med J 2012	R	7.6	10	73	17	–
Mesmar <i>et al.</i> ¹⁶	Eastern Mediterranean Health J 2009	P	3.6	31.4	30.4	2.1	38.2
Dhafar <i>et al.</i> ³	Pak J Med Sci 2015	R	7.6	42.81	20.03	9.45	5.17

Notes: P = prospective study; R = retrospective study.

Discussion

During our study, 103 surgical interventions were planned and of which 36.9% (n = 38) were cancelled. The cancellation rate was high in our study. In Nigeria, Ojo and Ihezue⁶ and Ramyil *et al.*⁹ reported that 28.5% and 36.4% of surgeries were cancelled respectively, while in developed countries the rate is much lower. In the United Kingdom,¹⁰ 8% of scheduled interventions were cancelled compared to 17.6% in India,² 7.6% in Saudi Arabia³ and 21% in Tanzania.⁴ Cancellation rates are listed in Table 4. Nevertheless, the incidence of cancelled scheduled surgery can reach 20 to 40%.^{5–7} Insufficient organisation may be the main cause. Cancellations generate under-utilisation of the OT, a low rate of efficiency, lengthening of waiting lists and, finally, an increase of global costs.² When resources are not correctly used the general population suffers, especially the underprivileged who depend on the public sector for their healthcare

requirements.² Cancellations result in financial, logistical and psychological problems for patients and their families, who have to organise a second operating date.² This high rate of cancellation reflects a high degree of wastage in our day-case practices. The majority of surgeries were general surgery (80.4%), gynaecology (11.7%), vascular surgery (7.8%) and urology (4.9%). The prevalence of pathologies varies in the literature.^{2,8} Most patients living in Ouagadougou (67.7%) were operated on at their first appointment compared to 32.3% of those resident outside Ouagadougou. This situation points to the need to hospitalise patients the day before surgery in order to decrease cancellations. However, in our context, the proportion of patients coming from outside Ouagadougou is not negligible (32.3%) and this is due to different reasons: a search for care quality, medical centres being partly non-operational and the diversity of interventions practised in the study hospital.

Almost half (47.4%) of the cancelled surgeries were related to equipment. In Saudi Arabia, the equipment problems contributed to 20.3% of cancellations.¹¹ Failure of sterilisation or the absence of some equipment, in association with management matters, cause many surgical unit cancellations. The unavailability of surgical specialists accounted for 36.9%. Lack of available surgical specialists associated with routine problems is a major cause of cancellations. A reasonable investment in equipment and drapes will also be necessary to ensure better continuity of service.

Patient-related causes accounted for 31.6% of cancellations, and 16.2% were cancelled due to a lack of funds. This is lower than the 42.8%, 74.4%, 62% reported respectively by Dhafar *et al.*,³ Ramyil *et al.*⁹ and Bode and Adeyeme.¹² In Saudi Arabia, Dhafar *et al.*³ reported 50% of cancellations being due to financial reasons. In our present study in Burkina Faso, the lack of a health insurance system is the main reason. Poverty prevents access to basic health care according to the World Health Organization (WHO).⁸ Dhafar *et al.*³ reported 20.7% of cancellations for non-compliance with the appointment by the patient compared to 7.9% in our series.

Cancellations following patient request (4.7%) in the literature^{8,10,13} were comparable with our data. Medical-related causes were found in 25% of cases. This study found substantial hospital-related cancellations of 63.9%. Ojo and Ihezue⁶ in Nigeria reported 40.3%. These causes are usually preventable. The high rate reflects the extent of neglect and infrastructural decay in our hospitals. Power failure accounted for 5.4% of cancellations. Frequent power failure and lack of surgical/theatre materials are not insurmountable. In our series, causes related to caregivers were 15.8%, compared with 8.4% in Tanzania.⁴ The incision of the first patient took place after 9 o'clock (62.5%). Cancellation for long preceding surgery was identified in 2.6% of cases. Kumar and Gandhi¹³ in India reported 63% of cancellations being due to a lack of time related to a long preceding surgical operation. Late starting time, going beyond expected duration and a long time cleaning the OT between two cases led to a waste of resources.^{3,11} The impact of an effective starting time of surgery in order to respect the appointment time seems obvious, as a late start prolongs total operating room time. This is a major cause of surgery being postponed due to lack of time. Good collaboration between practitioners would allow interventions to start early.^{3,11} Fortunately, 82.1% of cancellations occurred only once per patient but 14.3% of patients had two cancellations. The number of cancellations per patient varies from 1 (32.3%) to 4 (3.1%) according to the literature.^{3,10,14}

Our study showed that causes of cancellation are known: facility problems, delay, and an unavailability of practitioners. An important way to optimise OT utilisation timing is to start surgery on time. The majority of the operative surgical procedures (93%) were not started at the expected time. Therefore, precious OT time can be saved to admit other deserving patients. Studies have shown that patient preadmission can reduce cancellations.¹⁴

We recommend that a facility for hospital preadmission be created. There are some measures that are needed to reduce the case cancellation rate and to improve OT utilisation, including comprehensive assessment of patients prior to booking, making patients more aware about the planned surgical procedure and preparing them prior to operation. Making sure that all surgical patients have been examined and their cases discussed with the

consultant ahead of booking is also important to avoid a lengthy list. Moreover, many tasks such as room turnover time, starting on time and setting up of the anaesthesia equipment are of great importance. Attention must be paid to providing adequate, sufficient equipment and good management. The patient's admission on the preceding day, clear and honest information and good collaboration between OT players would reduce cancellations. Health and disability insurance could improve access to care for the entire population, thus decreasing financial insecurity.

In conclusion, the cancellation rate of scheduled surgeries is high in the general and abdominal adult surgery department of YOUHC. The majority of causes are foreseeable, avoidable and many are related to the hospital itself. Patient poverty also plays a considerable role in cancellations. It is vital to prevent further wastage by focusing attention on hospital welfare and general infrastructural developments complemented by better planning of day cases with refined preoperative patient counselling and booking to avoid unnecessary cancellations.

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Conflicts of interest – The authors declare that they have no competing interests.

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