ORIGINAL ARTICLE

REASONS FOR SURGERY CANCELLATION IN A PUBLIC HOSPITAL IN IRAN

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ABSTRACT

Cancellation of surgical cases is increasingly considered as an adverse event that requires routine monitoring because of its effects on utilization of health system resources. The aim of this study was to determine prevalence and identify the reasons of cancellation of scheduled surgery Yazd Shohada Kargar hospital, Iran. This is a retrospective study to descriptive reasons of surgery cancelation. Medical records were reviewed all patients scheduled for elective surgeries in a period of 1 year, starting from 21st of March 2011 to 20th of March 2012. The reasons of surgery cancelation were divided as avoidable and unavoidable reasons. Statistical analysis was performed using SPSS version 20 software. A total of 14,670cases were scheduled to undergo elective surgical procedures. Of those, 274 cases were cancelled (1.87%). Majority 184 (67.2%) of cancelation was due to avoidable reasons other 90 (32.8%) due to unavoidable reasons. The highest number of cancelation cases were occurred in the general surgical service 70 (25.5%) followed by orthopedic surgery 65 (24%) and Gynecology surgery 45 (16.5%). There were many causes were recorded for cancellation of surgeries, the most common cause was cancellation due to patient medical problems (35.6%) and the second most common cause of cancellations was patient refusing the surgery (28.4%). The least cause of cancellations was due to problem with Facilities (4.4%). In conclusion, majority of the cancelation was due to avoidable reasons. The highest number of cancellation occurred in the general surgical, orthopedic surgery and Gynecology surgery. The most common causes for surgery cancelation were due to patient medical problems and patient refusing the surgery. The least cause was due to problem with Facilities.

***Keywords**: Cancellations; Surgical Procedures; Elective, Preseasons of cancelation.*

BACKGROUND

Cancellations and delays of surgical procedures are common occurrences throughout the world. There have been many reports to show that this results in wastage of operating room time, prolongs the duration of hospitalization [1]. The reported rate of cancellation of elective surgery in the hospitals has ranged from 11.9 to 34% [2]. International studies have documented day-of-surgery cancellation rates as high as 13% for elective surgery [3]. High cancellation rates may indicate that rare health resources are being used ineffectively, thereby increasing costs [4] and reflects inefficiency in management [5] .It can significantly inconvenience patients and families and negatively affect also the nursing team (work operation, time and material resource consumption, diminished care quality) and the hospital itself [6]. The cancelling of the surgical procedure increases operational and financial costs, causing losses to the institution [6]. Patients are also affected by cancellations; they increase waiting times and may lead to harmful delays of operations [7]. Furthermore, it has been reported that the cancellation of an operation causes depression in patients as a result of the high level of emotional involvement associated with surgery [8]. The delays and postponements specifically lower the morale among the staff, patients and relatives and may reflect as a decreased productivity in their workplaces [1]. Traditionally, patients are admitted to hospital a day before the operation for preoperative assessment and preparation. Cancelation on the day of surgery among these patients may lead to prolonged hospital stay and additional costs [9] .Surgery cancelling is an error resulting from noncompliance with the unit's administrative planning requirements [6]. There are many reasons of cancellation of elective surgical cases; however it differs from hospitals to hospitals. Studies have indicated high frequency of cancelling, due to organizational problems in health institutions, including lack of beds, scheduling errors, communication errors and other administrative problems[6]. This study was conducted to determine

prevalence and the reasons of cancellation of cases elective surgical operations on the day of surgery at a general hospital (Shohada Kargar Hospital which is belongs to Iran Social Security Organization). The study detected possible weak points and suggest improving services that could reduce the rate of such cancellations and lead to a more efficient use of the operating theatres.

METHODS

this descriptive study was carried out at Shohada Kargar Hospital in Yazd city of Iran which belongs to Social Security Organization of Iran. This hospital is free of charge for those under Social Security Insurance and is a referral center and delivers hospital and outpatient care in several medical specialties which surgical patients represent 60% of total hospitalizations. In this hospital (270 beds and 7 operating theatres), there is a fixed operating day and theater for elective procedures for all of the surgeons. The cases are mixed of general, urology, ENT, gynecologic, orthopedic, eye surgery and neurosurgical cases. The hospital used a "Fixed Hour System" for Operation Room (OR) allocation. Therefore, there was an eight-hour block of time from eight to 16 hours from Saturday to Wednesday and on Thursday morning from 8am to 12MD, which operations could be conducted. Night periods, weekends and holidays are reserved for emergencies.

Most of the patients are admitted in the surgical wards the days before the surgery to facilitate their preoperative preparation. The operation lists for elective procedures is prepared and sent to the theater by the preceding night; while emergency lists are sent over as soon as they come. All the patients thus listed are evaluated in the ward by the anesthesia residents and potentially difficult cases are suggested for more work up. Cancellation was defined as the patient's name being on the published operating room list but the patient did not undergo surgery on the scheduled day. When a cancellation occurred, the nurses report the main reason for the cancellation in the nursing report sheet of the patient document. After discharge, during the patient coding and documentation process in the medical record unit the cancelation of the surgery is coded as Z53.9 Canceled procedure (surgical) according to ICD-10-CM Index. This study was approved by hospital ethics committee and did not require individual consent based on the hospital guidelines for waiving consent. The inpatient medical records were reviewed for all patients scheduled for elective surgeries in a period of 1 year, starting from 21stof March 2011 to 20^{et} of March 2012. The study population was patients who were scheduled to undergo elective surgery admitted at least one day prior to their operation.

A checklist including the patient' demographic data (such as gender, age), Circumstance in which surgeries were cancelled (before or after the preparation of the surgery room or during the surgical procedure), hospitalization unit, surgery, date and reason for cancelling was prepared and the researchers filled it up the research form after the reviewing of patient medical document of those with record of cancellation code. The causes of cancellation were divided into five categories that were determined based on previously conducted studies. These categories included patient-related, structure-process, facilities, surgeon and unrecorded factors. Structure-process factors were defined as the need for additional preoperative laboratory tests or clinical consultations prior to surgery, or as the occurrence of an upper respiratory tract infection prior to surgery. Patient-related factors were defined as the patient choosing not to undergo the procedure or inadequate preparation (need for extra preoperative preparations such as bowel preparation). Facilities factors were defined as inadequacy of medical equipment, unavailability of ICU bed or problem with operation room. Surgeon factors defined as if surgeon could not reach to hospital because of any reason. Unrecorded factors were defined as if the reason for cancelation was not recorded in patient medical document. Cancellation reasons were entered into the database as coded variables. Statistical analysis was performed using SPSS version 20 software.

RESULTS

During the study period 14, 670 cases were scheduled to undergo inpatient elective surgical procedures. Of those 274 (58.7% male and 42.3% female) cases with an average age of 50.92 ± 24.61 years (ranging from 1 to 90 years old) and average length of stay 1.3 day for all cancelled cases.

The point prevalence of cancellations was 1.87 %. The average of cancellation rate per month was 1.8%. From these, 70 (25.5%) cases were general surgery cases, 65 (24%) of them were orthopedic cases, 45 (16.5%) of them were gynecology cases, 34 (12.5%) of them urology cases, 32 (11.5%) of them eye surgery, 17 (6%) of them were ENT cases and 11 (4%) of them were neurosurgery cases (Table 1).

Table 1: Cancellation by Specialty

Specially	[1]Frequency	Percentage (%)	[2] Frequency	Percentage (%)
General surgery	2,485	17	70	25.5
Gynecology	3,701	25	45	16.5
Orthopedic	3,923	27	65	24
Urology	1,355	9	34	12.5
ENT	869	6	17	6
Neurosurgery	594	4	11	4
Eye Surgery	1,743	12	32	11.5
Total	14,670	100	274	100

[1]Frequency: Number of all scheduled cases, [2] Frequency: number of cancelled cases

Table 2 shows that causes for cancelation were divided into five categories: patient-related, structure-process, facilities, surgeon and unrecorded factors. The most common was structure-process related factors (49.0%) include; Patient Medical condition (35.6%), Change in treatment plan (11.8%), Unavailability of lab test (0.8%), and Medical evaluation- Incomplete pre-op (0,8%) . The second most common cause of cancellations was Patient related factor (30.0%) include; Patient refused or gave no consent (28.4%) and preoperative instructions not followed by patient (1.6%). Facility related factors stands for 4.4%, which include Equipment broken or not available 3.6%and operation room condition 0.8%. Surgery staff not available is the cause of 4.3 of the cancellation and in 12.3% of the cases explanatory documentation could not be found. From total cancellation cases, 32 (11.68%) occurred in the operation room.

Table 2: Causes of Surgery Cancellation

Categories	Cancellation reasons	Percentage (%)
Patient	Patient refused or gave no consent	28.4
	Pre-operative instructions not followed	1.6
	Subtotal	**30.0**
Structure-Process	Patient Medical condition	35.6
	Lab test result not available	0.8
	Change in treatment plan	11.8
	Medical evaluation- Incomplete pre-op	0.8
	Subtotal	**49.0**
Facility	Equipment broken or not available	3.6
	No intensive care unit beds	-
	operation room condition	0.8
	Subtotal	**4.4**
Surgeon	Surgery staff not available	**4.3**
Not recorded		**12.3**
Total		**100**

Surgery specialties had different cancelation reason proportions (Figure. 1). The Largest proportion in general surgery (41.5%), genecology service (65%), orthopedic surgery (51.7%), and urology (40.6%) was patient-related issues. The Largest proportion in ENT service (68.7%), neurosurgery (55%) and Eye surgery (83.3%) had cancelations due to structure-process related reasons. The least proportion in neurosurgery, Eye surgery and ENT service had only 11.1%, 13.3% and 25% of patient-related reasons. 11.7% of surgery cancellation happened in surgery room, which the largest proportion was patient related factors.

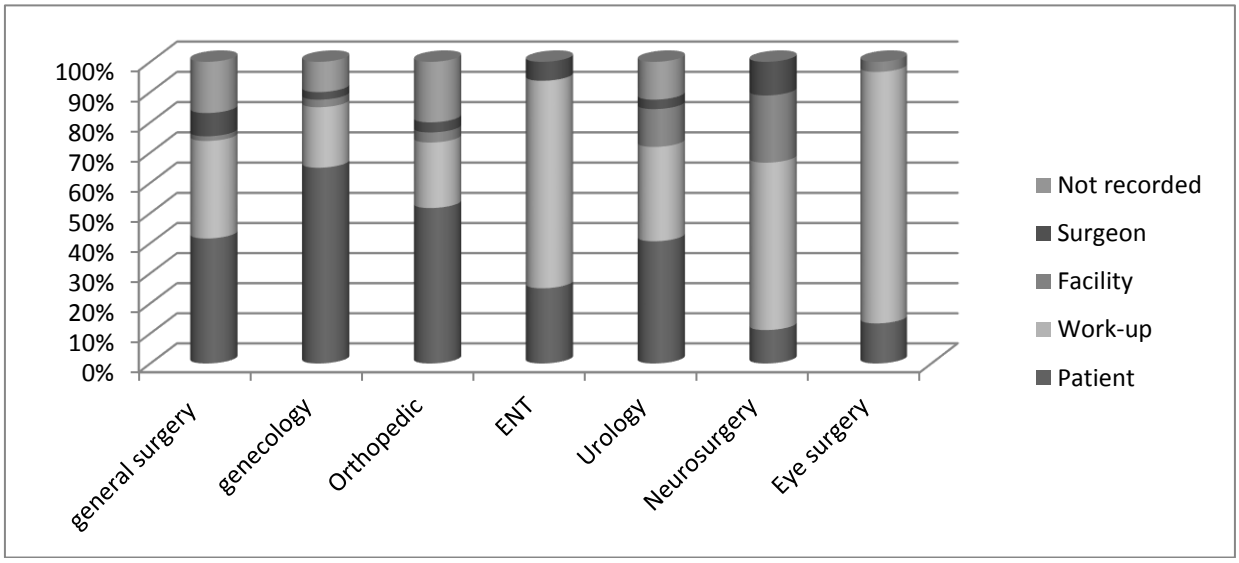

Figure 1: Cancellation Reason in Different Surgery Specialties

Table 3 presents avoidable and unavoidable reasons of surgery cancelation. Fifty-six cases (20.5%) were canceled due to unavoidable reason while 184 of cases (67.2%) were canceled due to avoidable reasons and reasons were not recorded for 34 (12.3%) cases. Among the avoidable cause of surgery cancellations, the patient medical condition was the most common cause of cancelation while among unavailable cause the most common cause was change in treatment plan.

Table 3: Reasons of Day of Surgery Cancellation

Avoidable	Unavoidable
Patient Medical condition	Equipment broken or not available
Lab test result not available	No intensive care unit beds
Medical evaluation- Incomplete pre-op	operation room condition
Patient refused or gave no consent	Surgeon condition
Preoperative instructions not followed or patient not instructed adequately	Change in treatment plan

DISCUSSION

This study investigated surgery cancelations on the day of surgery in a general mid-size hospital in Iran. Total cancelation rate was 1.87%. Yet, it varied between surgery specialties from 0% in Anesthesiology to 2.88% in General surgery service. The cancelation rate in our study was lower than study done by Nourouzinia et al [10] which found the cancellation rate of 18.6% in their study in a teaching hospital in Iran or study was done by Haana et al. [11] in Australia in which they found Over one year 7.2% of cases were cancelled on the Day of Surgery (DOS). Our study is in line with study was done in New South Wales, Australia, which the benchmark for booked patient cancellations on the day of surgery (for any reason) was less than 2%, cancellation due to a medical condition was set at less than 1%.[14].There is no consensus on the acceptable case cancellation rate when defining efficient operating theatres, but less than 5% is generally recommended.[13]. The finding of this study is that day of surgery cancellations can be decreased to less than 2%. Although our study was not designed to specifically test methods to decrease DOS cancellations, our low cancellation rate may be due to a combination of factors. These may include an expandable block schedule, good communication and coordinating between surgeons, hospital administration staffs and operation room administration staffs and high bed occupancy rate of hospital (86%) which make patients to not miss their operation schedule after long waiting time. The three top reasons for cancellation accounted for 75.8% of all cancelled surgeries and were all patient initiated. The two most cancellation reason was due to patient medical condition (35.6%) and cancellation based on patient's decision (28.4%). Cancellation due to Patient Medical condition due to unfit patients for surgery was most common in Eye surgery (83.33%)

and ENT service (68.75%) due to their age (average age of Eye surgery cancelled cases was 66.20 ± 20.29 and 50% of DOS cancellation cases was under 12 years old) while most cancelation reason in general surgery, genecology service, orthopedic surgery, and urology was based on the patients' own requests.

The second common reason for DOS cancellation was cancellation related to patient' decision which was in line with study was done by Schofield et al [2]. It is probably possible to avoid most of cancellations related to patient decision or not following the construction (1.6% of cases) by patient education. It is likely that, when patients feel that they are more involved in their care and know what will happen next, fear and doubt, contributing to cancellations, can be reduced [12]. Changing the view of the patient and including him/her in the whole planning process might be a way to reduce several of the reasons for cancellations, especially those directly related to the patient or to a poor pre-operative investigation [13].

The third reason for cancelation was operation no longer being necessary (11.8%). The cancellation reason related to patient medical condition could be reduced by medical evaluation before admitting to the hospital. It could be done even one month before the surgery as Pollard and Olson in their study [14] found that the DOS cancellation rate for outpatients was the same for patients evaluated within 24 hours of surgery versus those evaluated 2-30 days in advance. The findings of this research revealed that cancellations due to surgeon condition represented only 4.3% of the total and Surgery cancelling due to medical equipment problems just stands for 3.6%. Among total DOS 12.3% of cancellation did not have recorded meaningful explanation. Without knowing the reason of DOS it would be difficult to manage the problem. There was no report of cancelled case because of unavailability of beds and patient not showing up which is in contrast by study done by Jonnalagadda et al. [1] or by Schofield et al. [2]. In this study, 67.2% of elective procedure cancellations are potentially avoidable. These findings evidence concrete possibilities of reducing the level of surgical cancellations by using quality improvement techniques.

CONCLUSION

The study identified the causes and reasons of surgery cancelation. And, the prevalence of surgery cancelation was determined. Majority of the cancelation was due to avoidable reasons. The highest number of cancellation occurred in the general surgical, orthopedic surgery and Gynecology surgery. The most common causes for surgery cancelation were due to patient medical problems and patient refusing the surgery. The least cause was due to problem with Facilities. The prevalence of the cancelation was not high but nearly 70 % of the cancelation could be avoided. The surgery cancelation is one of the issues in the general hospital based on the study findings.

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