

Magnitude and Reasons of Surgical Case Cancellation at a Specialized Hospital in Ethiopia

Addis Shiferaw Ayele¹, Misrak Weldeyohannes² and Yohannes Tekalegn^{3*}

¹Department of Anesthesia, Kotebe Metropolitan University, Addis Ababa, Ethiopia

²Department of Anesthesia, Addis Ababa University, Addis Ababa, Ethiopia

³Department of Public Health, Madda Walabu University, Bale Robe, Ethiopia

*Corresponding author: Dr. Yohannes Tekalegn, Department of Public Health, Madda Walabu University, Bale Robe, Ethiopia, E-mail: yohannessefa@gmail.com

Received date: November 25, 2019; Accepted date: December 16, 2019; Published date: December 23, 2019

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Abstract

Background: Elective surgical case cancellation refers to any elective surgical case that is booked into the operation theatre list on the day prior to surgery but were not operated on the intended day of the schedule. Elective surgical case cancellation is common and can have significant adverse effects. The cancellation of planned surgeries causes prolonged waiting times, harm to patients, and is a waste of scarce resources. Reasons for cancellations are complex because they are related to patients, organizational issues, and clinical staff.

Methods: A hospital-based cross-sectional study was conducted from February 1 to March 1, 2016. All elective surgical cases which were scheduled for the surgical procedure during the study period were included in the study. Data were collected by using pretested structured questionnaires and entered into SPSS version 20 for analysis. The result of the study was reported in the form of frequency tables, pie chart and bar graphs.

Results: A total of 369 patients was scheduled for the elective surgical procedure during the study period. Among those 244 (66.1%) patients were operated on their planned day of surgery and 125 (33.9%) surgical procedure were canceled. The main reasons for cancellations were a shortage of time (39.2%); management related (21.48%) and patient-related factors (20%).

Conclusion: Cancellation of elective surgical procedures on the scheduled day of surgery was high during the study period. Most of the reasons for the cancellation was the shortage of time and management related and patient-related factors. Most of the reasons could be preventable. To reduce this high cancellation rate, implementation of patient preoperative assessment should be applied, ensuring realistic scheduling of patient considering time spent for each surgical procedure, reducing time spent in the operating room and better handling resources should be applied.

Keywords: Surgical case; Elective; Cancellation; Ethiopia

Abbreviations: ICU: Intensive Care Unit; OR: Operation Room; SD: Standard Deviation; SPSS: Statistical Package for Social Sciences; TASH: Tikur Anbessa Specialized Hospital.

Introduction

Cancellation of the elective planned surgical case is a known quality problem in the healthcare system that harms patient and waste resources, leading to increased healthcare costs. Reasons for cancellations are complex because they are related to patients, organizational issues, and clinical staffs [1]. Unexpected surgical cancellations are not uncommon [2]. The reported incidence of cancellation in different hospitals varies from 0.38% to 40% [3-18].

Surgery cancellations are undesirable in hospital settings as they increase costs, reduce productivity and efficiency, increase waiting lists, and directly affect the patients. Considerable resources are invested in maintaining operating theatres and having surgeons and theatre staff available on an agreed schedule. In spite of this, the cancellation rate of elective surgeries is high, especially in the public sector. Cancellations can significantly inconvenience patients and their families. It is also

reported that patients may suffer psychological stress, and/or financial hardship. Accordingly, cancellations are tense and costly, with a high level of emotional involvement before surgery [19,20]. This study aimed to assess the magnitude and reasons for elective case cancellation. It is relevant because researches and reviews are inadequate. Identification of reasons for elective surgical case cancellation will enable the health facilities to make appropriate strategies and make better use of its operation theatre facility.

Methods

Study area and period

This study was carried out in Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. TASH is Ethiopia's largest general public hospital and one of University Hospitals in the country. The hospital is the largest and oldest teaching hospital in Ethiopia providing teaching for about 300 medical students and 350 residents every year. TASH offers diagnosis and treatment for approximately 370,000-400,000 patients per year. The hospital has about 800 beds, with 130 specialists, 50 non-teaching doctors. The emergency

department sees around 80,000 patients a year. The study was conducted from February 1 to March 1, 2016.

Study design and aim

The hospital-based prospective cross-sectional study was conducted to determine magnitude and reasons for surgical case cancellation.

Study participants and sampling procedure

All patients admitted to the hospital for the elective surgical procedure from February 1 to March 1, 2016, were the source population. All patients scheduled for different elective surgical procedures during the study period were included in the study, and those listed for elective surgery but done before the day of schedule as an emergency were excluded.

Variables and measurements

Surgical case cancellation was the dependent variable of the study. Independent variables were; age, Sex, departments of patient admission, Patients related (medical, refusal, absent); Management related factors (ICU bed, equipment, electric power shortage); Shortage of time (prolonged case, over-scheduling); staff related factors (surgeon, anesthetist, nurse); Incomplete investigation. Cancellation of surgical procedure is defined as a planned operation that is not performed on the day of the schedule. Elective surgery is non-emergency surgery which is medically necessary, but which can be delayed for at least 24 hours.

Data collection technique and quality control

The data were collected by reviewing the daily schedule lists for elective surgery with a structured questionnaire which was developed by reviewing patients chart and related literature. The questionnaire included basic information about the patient and the presumed reasons for cancellation. Causes for the cancellation was identified by interviewing the operation theatre staffs (nurses, surgeons or anesthetists) and ward medical staffs on the day of surgery and immediately recorded in the predesigned form by the data collector. Data collection was conducted by two anesthetists and supervised by one experienced anesthetist. Training was given to data collectors and supervisor on data collection procedure, information to be collected and ethical handling of patients' data. Completeness of questionnaires was checked on a daily basis.

Data processing and analysis

Data was entered and analyzed using statistical package for social science (SPSS) version 20 software. Results were reported using tables, pie charts and bar graphs.

Ethical considerations

Ethical clearance was obtained from ethical review committee of Addis Ababa University, school medicine, department of anesthesia. After receiving ethical clearance, permission to conduct the research was obtained from the medical director and operating room (OR) directorate of the hospital. Verbal consent was obtained from all participants after explaining about the study and its importance. For children under 18 years old verbal informed consent was obtained from their parents or legal guardian. Name of the participant were

omitted from the questionnaire; instead we used medical record number to ensure confidentiality.

Results

Socio-demographic characteristics

A total of 369 patients were scheduled for elective surgical procedure during study period. The mean age of study participants were 27.9 ± 19.3 (SD) years. Among those 244 (66.1%) patients were operated on their planned day of surgery and 125 (33.9%) surgical procedure were cancelled. Among total cancelled cases, male accounts for 86 (68.8%) and females were 39 (31.2%). Male to female ratio of cancellation was 2.2:1 (Table 1).

Variable	Category	Frequency	Percent
Age	Less than 10	31	24.80
	10-20	12	9.60
	21-30	18	14.40
	31-40	30	24.00
	41-50	24	19.20
	51-60	7	5.60
	61-70	2	1.60
	Greater than 70	1	0.80
Sex	Male	86	68.8
	Female	39	31.2
n=Sample included in the analysis			

Table 1: Socio-demographic characteristics of cancelled surgical cases (n=125) in Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia, 2016.

Cancellations of elective surgical procedures among departments of the hospital

Among all departments, orthopedic surgery has highest rate of cancellation 38 (30.8%), followed by pediatrics department which accounts for 24 (19.2%) of the total cancellation (Figure 1).

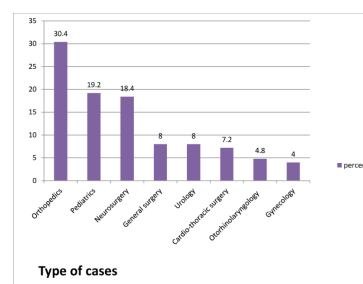


Figure 1: Cancellations of elective surgical procedure among departments of TASH, Ethiopia, 2016.

Reasons of elective surgical case cancellations

Out of all cancelled cases (n=125); the most frequent reasons for elective surgical case cancellation were shortage of time which accounts for 53 (42.5%). The second frequent reason was management related problems which accounts for 29 (23.2%) (Table 2).

Reasons	Category	Frequency	Percent
Patient related reason	Medical illness	7	5.6
	Lack of investigation	3	2.4
	Refusal	3	2.4
	Absent	5	4.0
	Not fasting	5	4.0
	Other	4	3.2
	Total	27	21.6
Medical reasons	Ischemic heart diseases	2	1.6
	Acute febrile illness	2	1.6
	URTI	3	2.4
	Others	1	0.8
	Total	8	6.4
Management related reason	Shortage of surgical materials	9	7.2
	Lack of Intensive care unit	2	1.6
	Lack of blood for transfusion	17	13.6
	Lack of oxygen	1	0.8
	Total	29	23.2
Emergency case encountered	-	1	0.8
Lack of investigation	-	8	6.4
surgical staff related reasons	-	9	7.2
Shortage of time	Previous case prolonged	13	10.4
	Emergency priority	2	1.6
	Over scheduling	38	30.4
	Total	53	42.4
Total		135	100

Table 2: Reasons of elective surgical case cancellation (n=125); Tikur Anbessa specialized Hospital, Addis Ababa, Ethiopia, 2016.

Discussion

Cancellation of elective surgical procedures in health institution is a considerable problem with many adverse consequences. Cancellations are major loss to health care resources, increases costs of operating rooms, results in wasted operating room time and decreases efficiency.

An efficient surgical service should have a low rate of cancellation. Elective surgical case cancellations decrease operation room efficiency and increases patients waiting time for operation, decrease patient satisfaction, waste medical resources, and undermine the morale of medical personnel [2,11].

This study aimed at assessing magnitude and reasons of elective surgical case cancellation in Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia. Rate of cancellation in this study was 33.9%. This result is higher when compared with the study conducted in Tanzania, 21%, South Africa, 5.6%, Sudan, 10.5%, Nigeria, 28%, Jimma University, Ethiopia, 23% and Hawassa, Ethiopia, 31.6% [11,13,20-23] America, 4.4% [5], Brazil, 6.8% [10], German, 12.7% [24], Wales, 7.6 [7], New Delhi, 17.6% [25]. Rate of elective surgical case cancellation ranges from 10-40% in developing countries [13] and 0.21-26% and developed countries [2]. This variation in the magnitude of cancellations could be explained by the fact that: facilities in resource limited area has high amount of case overload, and low surgeons to population ratio when compared with developed countries. Rate of cancellations in present study was higher than other Ethiopian studies. Since our study hospital is the referral center for all regions in Ethiopia, it might have higher loads of cases which may in turn result in higher cancellation rate.

This study found that cancellation rate out of total scheduled operations in male and female were 37.2% and 28.3% respectively. Out of all canceled cases proportion of male (68.8%) was higher than that of females (31.2%). This finding is in line with study conducted in Hawassa university comprehensive specialized hospital [23].

Present study found that surgical patients with age group less than 10 years were the highest scheduled age group 101 (27.4%) and their cancellation rate was also among the highest 31 (24.8%). Age group 31-40 years old were second highest canceled groups 30 (24.0%), and lower cancellation rate was observed in the age groups of greater than seventy years (0.8%). Study conducted in Spain revealed that cancellations were more common in patients with age group of 0-10 years, 13%, followed by age group of 21-30 years, 9%. Cancellations were less frequent in older age groups (71-80 years, 5%, and 61-70 years, 6%) [26]; this finding is similar with our result. It could be explained by the fact that anesthetists could face difficulty in intubation of endotracheal tube of children, finding venous line for parenteral administration of fluids, drugs and anesthetic agents. But in Sudan, the highest canceled group was 61-70 years old (31.1%) followed by 51-60 years old group (25.4%) [27].

In this study out of all departments orthopedics has the highest rate of cancellation 38 (30.4%), followed by pediatrics 24 (19.2%), neurosurgery 23 (18.4%) and the least was observed in Otorhinolaryngology 6 (4.8%). Our finding is similar with the study conducted in Saudi Arabia; orthopedics account the highest cancellation rate, 33.9% and Otorhinolaryngology has the least, 5.2% [8]. Our finding is in line with result reported by research conducted in Hawassa, where orthopedics has high cancellation rate [23]. Our finding differs from study conducted in Finland where orthopedics cases canceled, 31.8% [28]. In Saudi Arabia general surgery has high cancellation rate, 28% and neurosurgery was least, 3.1% [29].

This study found that the most common reasons for cancellation was shortage of time, 53 (39.26%) and management related factors, 29 (21.48%). This finding is almost similar with the study conducted in Spain where Shortage of time was frequent reason of cancellation, 36.6% [26]. But in UK patient related reasons, 51% [30] and in China

management related reasons, 73% were high [7]. The main factors leading to shortage time were over scheduling, 38 (71.7%) and prolongation of procedures prior to the scheduled case, 13 (24.5%).

Cancellation by all medical staffs were accounts for 7.2%, from this surgeons accounts for 6.4% and anesthetist 0.08% which is low compared to study in Saudi Arabia which reported 34% cancellation by medical staffs [31]. Management related reason accounts for 23.2% of cancellation. From this the frequent reason was failing to prepare cross matched blood 17 (13.6%), followed by operating room material shortage 9 (7.2%). When compared to study in Saudi Arabia management related reasons accounts for 20.03% of cancellation [8] and 25.5% in Sudan [12].

Since this study is a cross sectional study, we assessed cancellation rate at single point of time. Hence, we cannot generalize that the magnitude of cancellation to all months throughout the year. Further researches with longitudinal approach are recommended to assess the trends and temporal relationship over period of time.

Conclusion

Cancellation of elective surgical procedures on the scheduled day of surgery was high during the study period. Most of the reasons were shortage of time, management and patient related reasons. It is known that most of the reasons for cancellation were avoidable and can be prevented by different methods. There is need to further reduce operation cancellation rate which could lead to wastage of resources and precious time that can be used for providing more health care service to the population.

Limitations

This study is cross-sectional study. All limitations associated with the cross-sectional study may apply. Hence, seasonal variation in magnitudes of surgical case cancellation was not addressed by this study.

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from ethical review committee of Addis Ababa University, school medicine, department of anesthesia. After receiving ethical clearance, permission to conduct the research was obtained from the medical director and operating room (OR) directorate of the hospital. Consent was obtained from all participants after explaining about the study and its importance. For children less than 18 years old informed consent was obtained from their parents or legal guardian.

Consent for publication

Not applicable.

Availability of data and materials

The data that support the findings of this study are available from the corresponding authors upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This study was funded by Addis Ababa University. The funder has no role in designing of the study, analysis and interpretation of the results, writing of manuscript.

Authors' contributions

ASA, MW& YT involved in designing of the study, analysis and interpretation of the results, writing of manuscript, and read and approved the final version.

Acknowledgements

We thank Addis Ababa University for Financial support of this study.

References

1. Hovlid E, Bukve O, Haug K, Aslaksen AB, von Plessen C (2012) A new pathway for elective surgery to reduce cancellation rates. *BMC health Serv Res* 12:154.
2. Xue W, Yan Z, Barnett R, Fleisher L, Liu R (2013) Dynamics of elective case cancellation for inpatient and outpatient in an academic center. *J Anesth Clin Res* 4:314.
3. Argo JL, Vick CC, Graham LA, Itani KM, Bishop MJ, et al. (2009) Elective surgical case cancellation in the Veterans Health Administration system: identifying areas for improvement. *Am J Surg* 198:600-606.
4. Schofield WN, Rubin GL, Piza M, Lai YY, Sindhusake D, et al. (2005) Cancellation of operations on the day of intended surgery at a major Australian referral hospital. *Med J Aust* 182:612-615.
5. Kaddoum R, Fadlallah R, Hitti E, El-Jardali F, El Eid G (2016) Causes of cancellations on the day of surgery at a Tertiary Teaching Hospital. *BMC Health Serv Res* 16:259.
6. Abeeleh MA, Tareef TM, Hani AB, Albsoul N, Samarah OQ, et al. (2017) Reasons for operation cancellations at a teaching hospital: prioritizing areas of improvement. *Ann Surg Treat Res* 93:65-69.
7. Chiu CH, Lee A, Chui PT (2012) Cancellation of elective operations on the day of intended surgery in a Hong Kong hospital: point prevalence and reasons. *Hong Kong Med J* 18:5-10.
8. Dhafar KO, Ulmalki MA, Felemban MA, Mahfouz ME, Baljoon MJ, et al. (2015) Cancellation of operations in Saudi Arabian hospitals: Frequency, reasons and suggestions for improvements. *Pak J Med Sci* 31:1027-1032.
9. Sung WC, Chou AH, Liao CC, Yang MW, Chang CJ (2010) Operation cancellation at Chang Gung Memorial Hospital. *Chang Gung Med J* 33:568-575.
10. Santos GAACD, Bocchi SCM (2017) Cancellation of elective surgeries in a Brazilian public hospital: Reasons and estimated reduction. *Rev Bras Enferm* 70:535-542.
11. Elrahman AA, Hamza AA, El-Haj MA (2014) Cancellation of elective general surgical operations at the day of intended surgery. *Global J Med Res* 14.
12. Mutwali IM, Abbass AM, Elkheir IS, Arbab SS, Bur A, et al. (2016) Cancellation of elective surgical operations in a teaching hospital at Khartoum Bahri, Sudan. *Sudan Med Monit* 11:45.
13. Chalya PL, Gilyoma JM, Mabula JB, Simbila S, Ngayomela IH, et al. (2011) Incidence, causes and pattern of cancellation of elective surgical operations in a university teaching hospital in the Lake Zone, Tanzania. *Afr Health Sci* 11: 438-443.
14. Lankoande M, Bonkounou P, Traore SI, Kabore RAF, Ouangre E, et al. (2016) Cancellation of elective surgical procedures in the university teaching hospital center Yalgado Ouedraogo in Burkina Faso: incidence, reasons and proposals for improvement. *S Afr J Anesth Analg* 22:140-144.

15. Prin M, Eaton J, Mtalimanja O, Charles A (2018) High elective surgery cancellation rate in Malawi primarily due to infrastructural limitations. *World J Surg* 42:1597-1602.
16. van Klei WA, Moons KG, Rutten CL, Schuurhuis A, Knape JT, et al. (2002) The effect of outpatient preoperative evaluation of hospital inpatients on cancellation of surgery and length of hospital stay. *Anesth Analg* 94:644-649.
17. Tung A, Dexter F, Jakubczyk S, Glick DB (2010) The limited value of sequencing cases based on their probability of cancellation. *Anesth Analg* 111:749-756.
18. Pollard JB, Olson L (1999) Early outpatient preoperative anesthesia assessment: does it help to reduce operating room cancellations? *Anesth Analg* 89:502-505.
19. Granja C, Dyb K, Bolle SR, Hartvigsen G (2014) Reduced elective surgery cancellations through patient involvement in pre-operative planning in Norway. *Medicine* 164-169.
20. Ebirim LN, Buowari DY, Ezike HA (2012) Causes of cancellation of elective surgical operations at a University Teaching Hospital. *J Med Med Sci* 3:297-301.
21. Chamisa I (2008) Why is surgery cancelled? A retrospective evaluation. *S Afr J Surg* 46:79-81.
22. Haile M, Desalegn N (2015) Prospective Study of Proportions and Causes of Cancellation of Surgical Operations. *Int J Anesth Res*. 3:87-90.
23. Desta M, Manaye A, Tefera A, Worku A, Wale A, et al. (2018) Incidence and causes of cancellations of elective operation on the intended day of surgery at a tertiary referral academic medical center in Ethiopia. *Patient Saf Surg* 12:25.
24. Schuster M, Neumann C, Neumann K, Braun J, Geldner G, et al. (2011) The effect of hospital size and surgical service on case cancellation in elective surgery: Results from a prospective multicenter study. *Anesth Analg* 113:578-585.
25. Kumar R, Gandhi R (2012) Reasons for cancellation of operation on the day of intended surgery in a multidisciplinary 500 bedded hospital. *J Anaesthesiol Clin Pharmacol* 28:66-69.
26. Zafar A, Mufti TS, Griffin S, Ahmed S, Ansari JA (2007) Cancelled elective general surgical operations in Ayub Teaching Hospital. *J Ayub Med Coll Abbottabad* 19:64-66.
27. Hewawasam G, Maduwanthi A (2013) Cancellation of elective surgical procedures in the Genito-Urinary section of National Hospital of Sri Lanka—can we do better? *Sri Lankan J Anaesthesiol* 21.
28. Laisi J, Tohmo H, Keränen U (2013) Surgery cancellation on the day of surgery in same-day admission in a Finnish hospital. *Scandinav J Surg* 102:204-208.
29. El-Dawlatly AA, Turkistani A, Aldohayan A, Zubaidi A, Ahmed A (2008) Reasons of cancellation of elective surgery in a teaching hospital. *Intern J Anesthesiol* 15.
30. Sanjay P, Dodds A, Miller E, Arumugam PJ, Woodward A (2007) Cancelled elective operations: An observational study from a district general hospital. *J Health Organ manag* 21:54-58.
31. Sultan N, Rashid A, Abbas SM (2012) Reasons for cancellation of elective cardiac surgery at Prince Sultan Cardiac Centre, Saudi Arabia. *J Saudi Heart Assoc* 24:29-34.