ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 15, Issue 6, 2022

Online - 2455-3891
Print - 0974-2441

Research Article

IMPACT OF AUDIT AND POLICY IMPLEMENTATION ON ELECTIVE CASE CANCELLATION RATE: A RETROSPECTIVE STUDY

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Received: 02 March 2022, Revised and Accepted: 08 April 2022

ABSTRACT

Objectives: Cancellation of elective posted case on the day of surgery is the most distressing news for the patient and their wards and also leads to wastage of hospital resources. Cancellation of elective surgical case is a preventable situation, if the involved team members take necessary steps suitable for successful conduct of surgery. This study was done to assess whether audit of case cancellation and policies implemented have reduced the rate of case cancellation.

Methods: This audit was conducted for the past 3 years (2016–2018) in tertiary care hospital with 1500 beds and 12 functional elective operating rooms distributed among eleven specialties. Case cancellation done after the case was posted in the list was considered for the audit. With the consensus of both the surgeon and anesthesiologist, cancelled cases were entered in the cancellation form with the reasons specified. The forms were collected at the end of the day. Cancellations were discussed in operation theater (OT) committee meeting and new policies were made and remedial measures were taken.

Results: Total numbers of elective posted cases were 6094, 5623, and 5353 and case cancellation rate was 8%, 5.6%, and 5.7% in 2016, 2017, 2018, respectively. Patient-related factors were 4.45%, 2.86%, and 3.51%, surgery-related were 2.3%, 1.5%, and 1.21%, anesthesia-related were 0.07%, 0.21%, and 0.3% and infrastructure-related cancellation rate was 1.3%, 1.07%, and 0.69%, respectively. The cancellation rates have been decreased with statistical significance of $p<0.00001$.

Conclusion: Regular audit of OT utilization and policy implementation will significantly reduce the avoidable causes of case cancellation.

Keywords: Case cancellation, Elective surgical case, Surgery related cancellation, Anesthesia related cancellation, Operation theater utilization.

 DOI: http://dx.doi.org/10.22159/ajpcr.2022v15i6.44563. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Operation theater (OT) forms a major part of hospital income; hence, hospital resources should be better utilized. Cancellation of elective posted case on the day of surgery is the most distressing news for the patient and their wards. Cancellation of elective surgical case is a preventable condition provided involved team members take necessary steps to make the condition suitable for surgery. It is the administrator job to maintain quality and unhinderance work in OT. Hence, it is necessary to prevent the reasons causing obstacles for workflow. Various literature showed that audit on OT elective list cancellation had an important role for achieving good quality of work. In the USA, the cancellation rates range as low as 0.21% to as high as 26% [1]. In the UK, 8% of scheduled elective operations was cancelled. In most countries, 5–25% of all elective surgery cases are cancelled on the day of surgery [2]. In our institute, the cancellation rate audited in 2013 was 9–12%. OT procedure cancellation audit form with reasons for cancellation was introduced to capture the genuine reason of cancellation. New policies were introduced to reduce the case cancellation. We aimed to assess whether audit of case cancellation and policies implemented have reduced the rate of case cancellation.

METHODS

This is a retrospective analytical study which was done in Mahatma Gandhi Medical College which is tertiary care teaching hospital. Ethical Committee approval is obtained. During the period of audit, the college hospital had 1500 beds and 12 functional elective operating rooms distributed among 11 specialties: General surgery, cardiac surgery, orthopedics, ophthalmology, obstetrics and gynecology, urology, pediatric, plastic, and otolaryngology. Different specialties were allotted different rooms on specific days of the week and the elective work period was 8.30 am–4.00 pm. It is the anesthesia departmental policy that all patients planned for surgery should visit pre-anesthetic clinic (PAC) and obtain clearance for anesthesia. Sometimes, PAC opinion pending cases due to comorbid illness were posted in the list. Difficult cases (anticipated long surgeries or patients with poor general condition or comorbidities or difficult airways) were seen by the concerned anesthesiologist during PAC visit or 1 day before surgery. OT list was finalized by surgeons and sent to OR day before surgery. Case cancellation done after the case was posted in the list was taken for audit. Cancelled cases forms with reasons specified were collected at the end of the day with consensus of both the surgeon and anesthesiologist. The audit was conducted for 3 years period from 2016 to 2018.

The cancellation form was made available in OT secretary table (Fig. 1). Moreover, it was prepared based on categories as lack of time, cancelled by anesthetist or surgeon, lack of OT equipments, and scheme approval status (Table 1).

After 1 year, modifications were made to identify the clear cause of case cancellation (Fig. 2).

Administrator came into the loop and cancelled cases were discussed in OT committee meeting and suggestions were given. New policies include (1) scheme cases had to be posted only after obtaining scheme approval, (2) mentioning expected timing of each case while sending the list to avoid long list, and (3) PAC fitness had to be obtained before posting the cases were implemented. Reasons for cancellation of cases

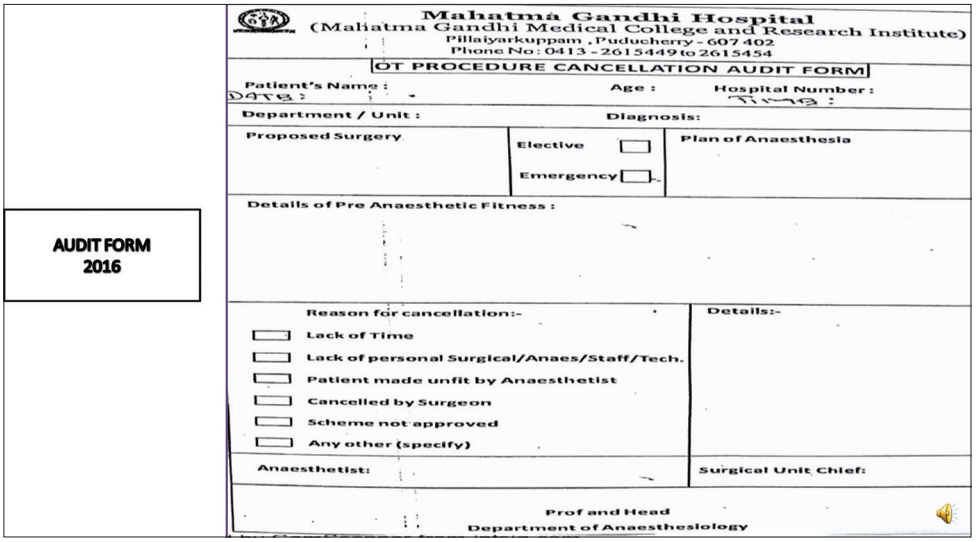

Fig. 1: Cancellation form version 1

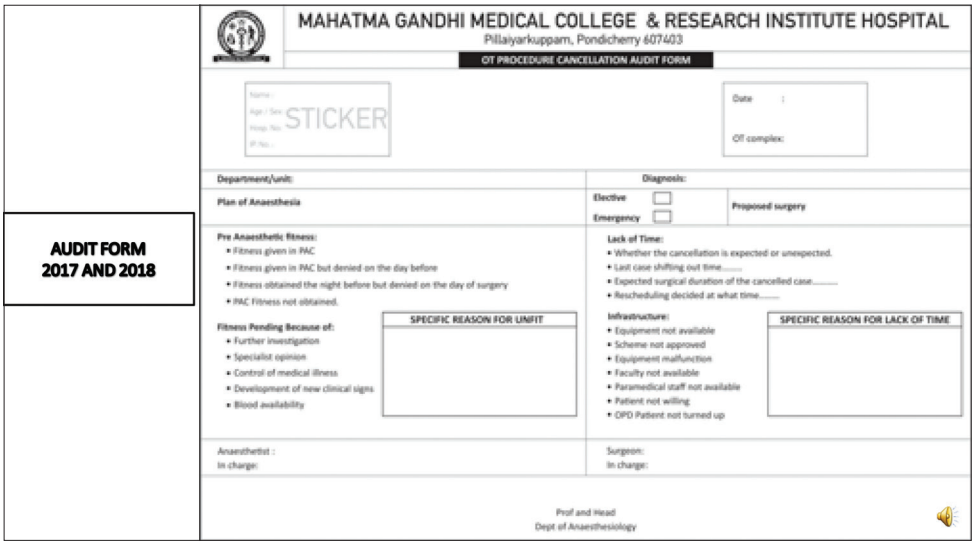

Fig. 2: Reformed audit form version 2

Table 1: Categories classified for case cancellation

Lack of time	The scheduled list is going beyond the elective operation theater time
Lack of personnel	Surgical/Anesthesia/Staff/Technician
Made unfit by Anesthetist	PAC fitness not obtained due to blood sugar not optimized, Blood pressure not optimized, recent respiratory infection
Cancelled by surgeon	Reason should be mentioned
Scheme not approved	
Any other	Patient not admitted, developed fever or respiratory infection, patient attenders not available, patient wants to have surgery at later date, and non-availability of required instruments

were classified as anesthesia-related, surgeon-related, infrastructure-, and patient-related (Table 2).

Retrospective analysis of impact of audit and policy implementation on elective case cancellation rate was done. Data were entered in Microsoft

Table 2: Classification of causes for case cancellation

Anesthesia-related	Case was cancelled after obtaining PAC fitness and asking for new investigation and cross consultation or developed anesthesia-related complication before start of surgery
Surgery-related	Patient is posted without control of medical illness
Infrastructure	Scheme not approved or requirement of sharing of equipment and non-availability of faculty
Patient-related	Patient had developed new clinical signs after obtaining PAC fitness and OPD patients did not report and patient financial issues

OPD: Outpatient department

Excel sheet and statistical analysis was done with percentage and Chi-square test and $p<0.05$ is taken as significant.

RESULTS

Total number of elective posted cases was 6094 in 2016, 5623 in 2017, and 5353 in 2018. Four hundred and eighty-seven in 2016, 316 in 2017, and 306 in 2018 cases were cancelled due to various reasons (Fig. 3). Case cancellation rate was 8%, 5.6%, and 5.7% in 2016,

2017, and 2018, respectively. Patient-related reasons were the major contribution for case cancellation followed by surgery-related reasons and infrastructure-related reasons. Anesthesia-related reasons were the least cause for case cancellation (Fig. 4).

Patient-related, surgery-related, and infrastructure-related factors all showed decline trend in case cancellation over these 3 consecutive years. However, anesthesia-related factor showed a mild increase in case cancellation (Fig. 5). The cancellation rates have been decreased with statistical significance of $p<0.00001$.

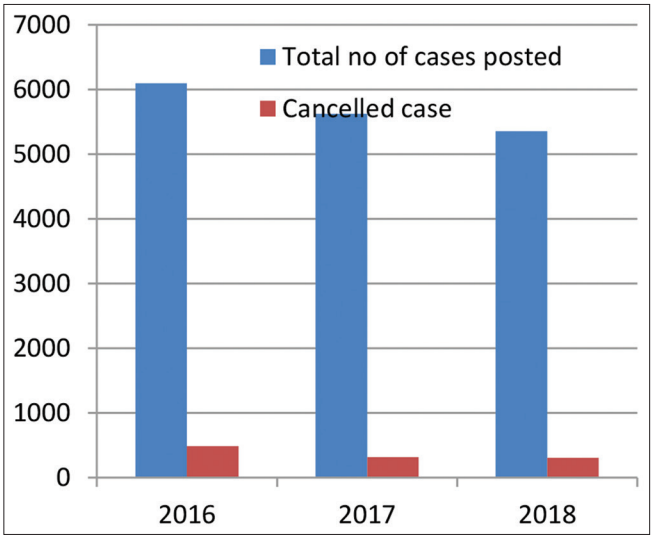

Fig. 3: Number of cases posted and cancelled cases in 3 consecutive years

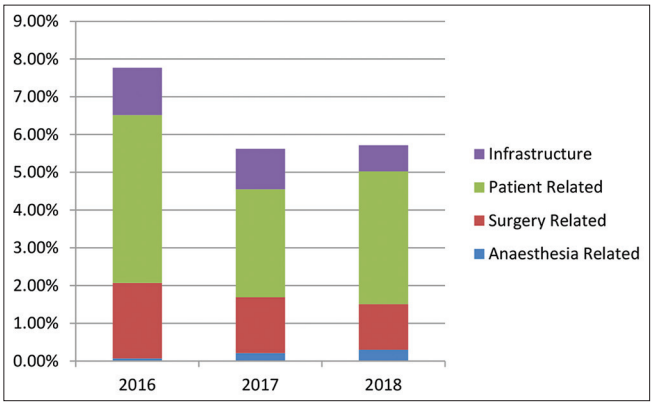

Fig. 4: Rate of cancellation and the various reasons for cancellation of surgery for 3 consecutive years

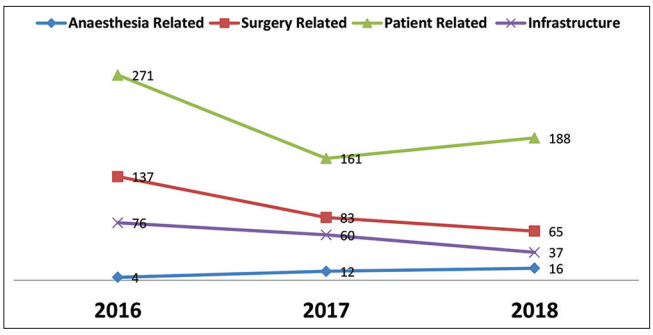

Fig. 5: Trend of factors of cancellation of elective cases over 3 consecutive years

DISCUSSION

Case cancellations on the day of surgery are a recognized problem in hospitals throughout the world. An efficient surgical service should have a low rate of cancellation of operations. Cancellations lead to underused OTs, jeopardized efficiency, increased waiting list, and increasing cost [1]. Cancellations create huge financial, logistic, and psychological hardships for the patients and their relatives who plan their working and family lives around postponed date of operation [3,4].

An audit helped in identifying situations where modifications might result in more efficient use of available operating time [5]. Hence, cancellation audit form was created by the anesthesiologist based on the stakeholders and infrastructure. Manual prospective collection of data on causes of cancellations by dedicated personnel may yield data of better quality with a costly solution [2]. OT secretary was responsible to collect the filled form. There was a debate and discrepancy regarding avoidable reason of cancellation and the department that is responsible for cancellation of cases. Hence, further modifications were made in the cancellation form. Initially, there was a reluctance and unresponsiveness in filling the case cancellation form. The importance of this audit was explained in the OT committee meeting and policy for strict adherence was implemented.

Patient-related factors of which outpatient department patients not showing up during their appointment contribute to most of the case cancellation similar to Paschoal and Gatto [6]. This may be due to the patient's last-minute doubts and fears and efforts should be made to improve patient communication and facilitate their compliance with scheduled procedures [3]. Absence of separate facilities for day-case surgery and utilization of same OT for in- and out-patient surgery also form a major contributing factor. As suggested and followed by Lee *et al*. and Turunen *et al*. [7,8], promoting scheduled arrivals of surgical patients to the hospital can be achieved through pre-operative phone calls by the nurses to the patients that may succeed in lowering the rate of operation cancelations.

Regarding infrastructure-related factors, pending scheme approval was the main reason for case cancellation. Discussion in the OT committee meeting leads to the implementation of policy where cases were posted after obtaining scheme approval which reduced the cancellation significantly. To reduce the case cancellation, due to lack of time, our hospital administration implemented extended work timing to finish the cases on the elective OR schedule day similar to the observations by MGM, Boston [9]. Very rarely, cases were cancelled due to (1) non-availability of surgeon, (2) sharing of instruments, and (3) non-availability of implants.

Surgery-related factors form the second common cause for cancellation due to case scheduling without optimization of medical illness as observed in the study done by Kumar and Gandhi [3]. The major reasons were hypertension, recent onset respiratory tract infections, uncontrolled diabetes, and an acute onset cardiovascular abnormality and it was reduced by 50% after introduction of cancellation form and implementation of policy.

Anesthesia-related factors for cancellation were the least reasons for cancellation and Hussain *et al*. reported that 8% of cancellation of cases, on the day of surgery, was anesthesia-related [10]. Case cancellation due to lack of time is usually due to underestimation of operating time as the lists prolonged beyond schedule as observed in the study done by Sanjay *et al*. [11]. Since our hospital is postgraduate institute, the time taken between surgeons and residents may vary. Although our hospital administration implemented flexible work timing, it usually applies for the cases that extends beyond the working hours and new cases with expected surgery time more than 2 h were not taken after 3PM because anesthesia and shift time further get added and whole process may go beyond 3 h. Pandit *et al*. also found that over running OT lists were the most common cause of cancellation of cases on the day of surgery (50% lists were overbooked and 50% over ran their scheduled time) [12].

Vinukondaiah *et al.* documented that lack controlled operating time was the single most important factor for cancellation of cases. This was mainly because surgeons took longer than the estimated duration of surgery [5].

Surgery department had the highest case cancellation similar to Schuster *et al.* [13] and followed by orthopedics and least cancellation being in ophthalmology and cardiothoracic department. The literature showed that department-wise cancellation varies from place to place. Schofield *et al.* in his audit found that ENT surgeries experienced the most cancellations (19.6%), followed by cardiothoracic surgery (15.8%) [14]. Lacqua *et al.* found that plastic surgery had significantly more and orthopedic surgery and obstetrics and gynecology had significantly fewer cancellations [15].

CONCLUSION

Regular audit and policy implementation are necessary for effective utilization of hospital resources and satisfaction of patients, relatives, and healthcare workers and will significantly reduce the avoidable causes of case cancellation.

AUTHOR CONTRIBUTIONS

Dr. Swati Jayant Pawar: Collection of data; Dr. Rani P: Protocol writing and write-up; and Dr. Hemanthkumar VR: Protocol write up and statistics.

CONFLICT OF INTEREST

There is no conflict of interest.

AUTHORS' FUNDING

There is no funding.

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