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30-Day Readmission Rate and its Causes in General Surgical Patients

Rizwan Sultan¹, Umme Hani Abdullah² and Tabish Chawla¹

ABSTRACT

Objective: To find out the 30-day readmission rate for different surgical procedures and determine the causes for readmissions.

Study Design: An audit report.

Place and Duration of Study: Department of Surgery, The Aga Khan University Hospital, Karachi, in the calendar year 2014.

Methodology: Records were retrospectively reviewed for 30-day readmission rate and their cause in general surgical patients who underwent a general surgical procedure at The Aga Khan University Hospital, Karachi, in the year 2014.

Results: Out of 217 (6.4%) readmissions in 3,387 patients, more than 50% unplanned readmissions were avoidable. The highest readmission rate was after placement of feeding tubes (28.5%).

Conclusion: More than half of the readmissions could have been prevented by proper patient/attendant education, good communication and provision of nursing services to these patients beyond the hospital.

Key Words: Surgery patients. Readmission rate. Causes of readmission. Tertiary care centre.

INTRODUCTION

Whether planned or unplanned, readmission in a hospital is an additional financial, social and psychological burden to both patient as well as family. It is also a quality indicator for hospital in NHS, and contributes to "star" status for a hospital. From 2003 to 2004, 19.5% of all medicare beneficiaries, who were discharged from a hospital, were readmitted within 30 days, leading to a cost of \$17.4 billion.¹ It was estimated that a single readmission after pancreatic resection costs an average of \$16,000 or more.¹ Readmission problem is different in surgical patients compared with medical patients.^{2,3} After a surgical procedure, majority (70.5%) of readmissions are due to medical conditions and are unavoidable. Among the medicare beneficiaries undergoing major bowel surgery, 16.6% were readmitted for gastrointestinal problems, and 6.4% were readmitted with a postoperative infection.⁴

In developing countries like Pakistan, where there is a marked shortage of nursing care outside hospitals,⁵ risk of readmission with minor ailments increases significantly.⁶ Similarly, readmission rate seems also related to the education of the caretakers about the disease.^{7,8} Besides cost of treatment, avoidable readmissions also burdens emergency departments of

hospitals with preventable admissions.⁹ Data regarding cost of readmissions after a surgical procedure is not available from Pakistan or South Asia.

Knowledge of causes of readmissions is important to be able to avoid the avoidable causes; and rate of readmission is important for preoperative counselling of patients and their families to decrease the anxiety and frustration associated with readmissions.

The objective of this study was to review all general surgical procedures performed in the year 2014 to find out procedure specific 30-day readmission rate and causes of these readmissions.

METHODOLOGY

Exemption from Ethical Review Committee of The Aga Khan University was taken prior to the start of study (3973-sur-ERC-15). The audit included all patients undergoing general surgical procedures in the year 2014 at Aga Khan Hospital, Karachi. The patients who left against medical advice or died during the index hospital admission were excluded from the study.

The investigators reviewed computer records of all patients for 30-day readmissions. Medical records of the patients with readmissions within 30 days of their discharge were then reviewed for cause of readmission; and details of the readmission were recorded on a pre-designed proforma. The variables recorded were the cause of readmission, median days between discharge and readmission, whether readmission was planned or unplanned/avoidable or unavoidable, requirement of intervention in readmission, and eventual outcome.

Data was entered in SPSS 19. Continuous variables like age, length of stay, and time between primary discharge to readmission were measured by using mean +/- SD or

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medians with IQR. The categorical variables were described in frequency with percentages. Comparison between the two groups was done using Chi-square test. P-value of <0.05 was considered significant.

RESULTS

The total number of procedures performed in the year 2014 in the Department of General Surgery at Aga Khan University Hospital, Karachi, was 3,428 (Table I). Mean age was 46.94 ±15.9 years. Nineteen hundred and fifty-four (57%) patients were male. Median LOS (length of stay) was 2 days (IQR 1-4). Three thousand (87.5%) procedures were performed under general anesthesia. Two thousand, seven hundred and fifty-one (80%) procedures were done after admitting patient in the hospital; 2,451 (71.5%) cases were electively planned before the day of surgery. There were 41 deaths among these patients (mortality rate 1.1%), rest of 3,387 patients

Table I: Details of patients (n=3,428) who underwent general surgical procedures at AKUH in the year 2014.

Variables	Frequency
Mean age	46.94 ±15.9 years
Gender	
Males	1954 (57%)
Females	1474 (43%)
Median LOS	2 days (IQR 1-4)
Median length of surgery	60 minutes (IQR 35-92)
Type of anesthesia	
GA	3000 (87.5%)
LA	299 (8.8%)
Regional (spinal, caudal, epidural)	113 (3.3%)
MAC (monitored anesthesia care)	16 (0.5%)
Nature of admission	
Inpatient	2718 (79.3%)
Day care	710 (20.7%)
Nature of procedure	
Elective	2451 (71.5%)
Emergency	759 (22.1%)
Add on	218 (6.4%)
Outcome	
Mortality	41 (1.2%)
Alive	3387 (98.8%)

Table II: Details of 30-day readmissions.

Variables	Frequency
Number of patients followed for 30-day re-admissions	3387
Total re-admissions	217 (6.4%)
Planned re-admissions	32 (14.9%)
Duration between primary discharge and re-admission	(median) 15 days (IQR 3-23)
Unplanned re-admissions	185 (85.1%)
Unplanned unavoidable re-admissions	91 (49%)
Duration between primary discharge and re-admission	(median) 8 days (IQR 3-17)
Unplanned avoidable re-admissions	94 (51%)
Duration between primary discharge and re-admission	(median) 3 days (IQR 1-7)
Second intervention required	15 (0.44%)
Mortality	4 (0.12%)

were discharged from hospital. Out of these, 209 (6.17%) patients were readmitted within 30 days of their discharge. Eight patients required more than one readmission within 30 days making, a total of 217 readmissions (6.4%).

Out of 217 admissions, 32 admissions were planned at the time of discharge and were not avoidable (Table II). Rest of 185 readmissions were unplanned. Ninety-four unplanned admissions were due to minor issues like increased ileostomy output, postoperative pain, nausea, vomiting, urinary retention or surgical wound related issues. These were managed in emergency room and did not require any further interventions; while 91 patients were admitted in the hospital and 15 required another intervention for a postoperative complication. Seventy-six patients had a medical issue like electrolyte imbalance, kidney injury or pneumonia, which did not require any intervention. Out of 15 patients requiring surgical intervention in the readmission, there was no mortality; but out of 76 who were conservatively treated, there were four mortalities.

Procedure-wise readmission rate (Table II) showed that the patients operated for placement of feeding tubes had highest 30-day readmission rate of 28.57%. After major abdominal surgeries like Whipples procedure and Ivor Lewis Esophagectomy, the 30-day readmission rate was 21.74% and 14.28%, respectively. Stoma formation in lower GI surgery was associated with readmission rate of 15.7% at the time of primary procedure and an additional 10.5% readmission rate after stoma closure; while lower GI surgery without stoma was associated

Table III: Procedure-wise readmission rate.

Procedure	Total patients	Readmission	No readmission	Procedure specific readmission rate
Hernia	326	25	301	7.67%
Wound debridement and amputations	173	14	159	8.1%
Skin and subcutaneous tissues	490	20	470	4.08%
Anal and perianal procedures	374	17	357	4.54%
Diagnostic lap	47	6	41	12.76%
Endoscopic procedures	40	2	38	5%
Appendectomy	167	10	157	5.99%
Cholecystectomy	1033	37	996	3.58%
Splenectomy	14	1	13	7.14%
Feeding tubes	63	18	45	28.57%
Bile duct and liver	32	1	31	3.125%
Gastric procedures	60	3	57	5%
Whipple	23	5	18	21.74%
Two-stage esophagectomy	21	3	18	14.28%
Abdominal mass	19	3	16	15.79%
Pancreatic procedures	6	0	6	0%
Lower GI surgery with stoma	140	22	118	15.71%
Lower GI surgery without stoma	95	6	89	6.32%
Stoma closure	86	9	77	10.5%
Other Laparotomy	178	15	163	8.43%
Total	3387	217	3170	6.40%

with readmission rate of 6.32%. This difference between the two groups was statistically significant ($p=0.029$).

DISCUSSION

This study showed that 30-day readmission rate after discharge was 6.4% in general surgery department of the Aga Khan University Hospital, Karachi. More than 50% of unplanned admissions were for minor issues and were avoidable with good communication and education at discharge and better involvement of nursing staff outside the hospital (home healthcare). It would have helped in reduction of overall cost of the treatment as well as burden on the Emergency Department of the hospital.

The highest readmission rate was associated with placement of feeding tubes. There are two reasons for these readmissions. Most of these patients with malignancy were planned for chemotherapy and some are elderly people with multiple comorbidities requiring readmission due to medical issues. Every 5th and 7th patient gets readmitted after major abdominal procedures like Whipples procedure and Ivor Lewis Esophagectomy. Another interesting finding was, readmission rate in lower GI surgery patient with stoma, which was 2.5 times the readmission rate in patients without stoma. The patients with stoma had to bear another 10.5% readmission rate at the time of stoma reversal surgery.

There is very little data on readmission rate and its causes after discharge from surgery department. In 2007, Dayo *et al.* suggested that the readmissions cannot be predicted on the basis of age, comorbidities, psychiatric illness and number of drugs on discharge.¹⁰ In 2011, Atul Gawande suggested that if we target the patients who are at high risk for readmissions, we can certainly decrease number of readmissions and save cost.¹¹ These patients were labelled as "hot spots". In 2012, Kassin *et al.* concluded that multiple comorbidities, inpatient surgical procedures and need of admission before surgery were risk factors for readmission.¹² Intraabdominal procedures were prone with more readmission rate requiring more vigilance and attention.¹³ Less educated family and poor socioeconomic background are also found to be significantly associated with the readmission rate.¹⁴ Similarly, stoma formation is also associated with higher postoperative readmission rate.¹⁵

To the best of authors' knowledge, this is a first study looking at readmission rate and causes of readmissions in Pakistan. Large number of patients, variety of surgical procedures, and utilization of computerized data for retrieval of readmissions were our advantages; while we could have missed the patients not readmitted in the hospital. The authors have introduced concept of hotline, in which a cellular phone carried by a registered nurse is given to the patient at discharge so that he/she

can contact her regarding any complaint at home to decrease the unplanned avoidable readmission rate.

CONCLUSION

Effective communication using hotline, patient education and use of home healthcare services can decrease unplanned avoidable admission rate. In some high risk procedures, the risk of readmission should be explained to the patients preoperatively.

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