Surgical Readmissions: Causes And Cost Implications

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Citation

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Abstract

Background

The unplanned readmission rate is a national performance indicator used to measure hospital care outcomes. Readmissions highlight gaps in the delivery of care and also increase cost to the healthcare system. The objective of this study was to analyse the incidence, causes and financial implications of surgical readmissions. This would in turn help to develop effective care pathways to reduce the avoidable readmissions and improve the overall patient care.

Methodology

A retrospective analysis of all surgical readmissions over a period of 12 weeks in two District General Hospitals in the UK was done. Case notes, electronic discharge summaries and clinical coding records were reviewed to collect the required data.

Results

197 case records were reviewed. The majority of readmissions following initial elective and emergency admissions were related to the index pathology [67.9% and 81.1% respectively]. Non-surgical causes (20%), post-operative wound collection [10.6%], cholelithiasis [10.1%], non-specific abdominal pain [7.6%], and post-operative pain [6.6%] were the main causes identified. 60% of patients were women. 80.9% of all patients readmitted on account of post-operative wound collections required drainage procedures. Short-term readmissions (overnight stay) made up 26.9% of all readmissions within the study period. Non-surgical index pathologies were coded as surgical admissions (10.8%). The overall cost of readmissions was £ 395,495, with a projected annual cost of £ 1.7 million. 27 (13.7%) readmissions reviewed were avoidable with a projected annual cost of £ 182,593, which could have been avoided. Coding errors were responsible for 11.2% of all readmissions under the surgical directorate.

Conclusions

Causes of readmissions are usually multifactorial and have huge financial implications for healthcare providers. Effective care pathways both in secondary and primary care are needed to reduce readmissions.

INTRODUCTION

There were 560,807 hospital readmissions in England in 2011-12 and over a 10-year period there was a 27% increase in the readmission rate from 9.01% to 11.45% (1). Emergency readmission rates are used as a national performance indicator to benchmark healthcare performance and provide information to monitor NHS service provision. The Department of Health (UK) policy implies that any readmission within 30 days of discharge will mean a non-payment of charges, which brings in new challenges to an already stretched financial budget of acute trusts (2). It is also known that a small reduction in readmission rates could have a substantial financial impact (3). Research has aimed to identify and reduce hospital readmission rates and in turn to improve patient care (4). Readmissions could represent a failure of plan of care or an occurrence due to an unexpected adverse event (5). Mismatches in demand and capacity of beds might have an effect on patient discharge and readmission rates (6). Various factors influence hospital readmission rates and their use as an indicator of quality of care is still debated (7-10).

The objective of this study was to analyse the incidence, causes and financial implications of surgical readmissions in two busy London hospitals. This would in turn help to develop effective care pathways to reduce the avoidable readmissions and improve the overall patient care.

METHODOLOGY

This study was registered with the Audit department of the Barking, Havering and Redbridge NHS trust. As it was an evaluation of routine practice and a service improvement process, ethical clearance was not deemed necessary. All surgical readmissions over a 12-week period between the April 2012 and July 2012 at two busy Hospitals in London were analysed. As a part of the study, case notes, electronic discharge summaries and clinical coding records were reviewed. We collected data on patient demographics, index procedure, emergency or elective admission, length of stay, time from discharge to readmission, cause for readmission, intervention provided, cost of treatment or intervention. We then looked at the coding of the patient episode and compared this to the patient notes. We also recorded the index procedure, the diagnosis and the clinical codes recorded. The cause of readmission was taken as the single most appropriate diagnosis causing the patient to re-present. All costs of patient care were obtained from the trust finance department including the total reductions made by the Primary Care Trust. Annual projections were made based on the details obtained from this data.

Exclusion criteria included: emergency transfers from other hospitals, patients readmitted following a self-discharge against medical advice, any patient who was initially admitted under obstetrics and any patient diagnosed with cancer. Readmission was defined as any emergency admission occurring within 30 days of a prior admission. Descriptive statistical analysis was done to evaluate the results.

RESULTS

234 cases of readmissions were identified during the study period. Medical records from 37 patients' notes were unavailable and hence were not included in the analysis. In total, 197 case records were available and reviewed. There were 118 female and 79 male patients in this study group. The average age of the study group was 51.6 years (range: 4-95). The average duration of stay in the hospital prior to discharge was 3.4 days (range: 1-41). Cases were broadly categorized into groups and are as shown in figure 1. Gastrointestinal disorders (22%) were the largest group, which included diverticular disease, inflammatory bowel disease, perforation, obstruction and ano-rectal causes. Pancreatic and hepatobiliary conditions (16%) were the second largest group; majority of which were due to cholelithiasis and its complications. 14% of cases were due to non-specific abdominal pain (NSAP) and 10% were related to cancer related conditions. Appendicular pathology contributed to 6% of cases, whilst 8% were due to vascular causes. The mean duration of stay prior to discharge of all cases was 3.42 days (range: 1-41).

The causes of readmissions are as shown in figure 2. Non-surgical causes like electrolyte imbalances and gynaecological pathologies contributed to 20% of readmissions. Wound infections and collection formed 10% of cases, whilst non-specific abdominal pain (NSAP) was noted in 13% of cases. Urinary tract infections formed 5% of cases and 3% readmission were due to post-operative pain. 1% of cases were due to respiratory tract infection.

We also performed a subgroup analysis based on initial elective and non-elective admissions. Of the 197 cases, 138 (71%) cases were initially admitted as acute emergencies and the remaining 59 (39%) cases were initially admitted for elective surgical procedures. Mean age of patients in the emergency admission group was 48.4 (range 13-95) and that of the elective admission group was 58.6 (range: 4-92). 60% (83) of cases were women and 40% (55) were men in the emergency admission group. In the elective admission group, there were 35 (59%) women and 24 (41%) men. The main cause for readmission in the elective admission group was post-operative wound collection (25%), which was followed by pain (20%). Less frequent causes were grouped in the 'others' category. This included elective cystoscopy (n=1); hospital acquired pneumonia (n=1); cellulitis (n=1); pleural effusion (n=1); anaemia (n=1); ileus (n=1) pulmonary oedema (n=1) and diarrhoea (n=1). The average number of days to a readmission in this group was 11 days. For the emergency admissions group non-specific abdominal pain made up the majority of readmissions (13%) followed by cholelithiasis (11%). The "others" category included: endometrial cancer (n=1); T-lymphoma (n=1); peripheral vascular disease (n=1); ovarian cyst (n=1); colon cancer (n=1); electrolyte imbalance (n=1); liver biopsy (n=1); portal vein thrombosis (n=1); appendix mass (n=1); broken jejunostomy tube (n=1); acute urinary retention (n=1); hypoglycaemia (n=1); pulmonary embolus (n=1); mesenteric adenitis (n=1), osteomyelitis (n=1); urinary tract infection (n=1) and luteal cyst (n=1). The average number of days to a readmission in this group was 10 days.

The majority of readmissions following initial elective and emergency admissions were related to the index pathology (67.9% and 81.1% respectively). Post-operative wound collection (10.6%), cholelithiasis (10.1%), non-specific abdominal pain (7.6%), and post-operative pain (6.6%) were

the main causes identified for readmissions. 80.9% of all patients readmitted on account of post-operative wound collections required drainage procedures. Short-term readmissions (overnight stay) made up 26.9% [53/197] of all readmissions within the study period. Of the 197 readmissions, 43 were unrelated to the index pathology (21.8%). Diagnosis included benign prostatic hypertrophy, lower respiratory tract infections, hypertension, gastroenteritis, convulsions, chronic obstructive airways disease, constipation, fracture of neck of femur, renal failure, head injury and sickle cell crisis. Also non-surgical index pathologies were coded as surgical admissions (10.8%).

The overall cost of readmissions was £395,495, with a projected annual cost of £1.7 million. 118 of these were related to the index procedure, however 79 were not - this cost the trust £97,722 with a projected annual cost of £423,462. 27 readmissions reviewed (13.7%) were avoidable with a projected annual saving of £ 182,593. These coding errors were responsible for 11.2% of all readmissions under the surgical directorate, which cost £39 172.

Figure 1

Pie chart showing diagnosis at first admission

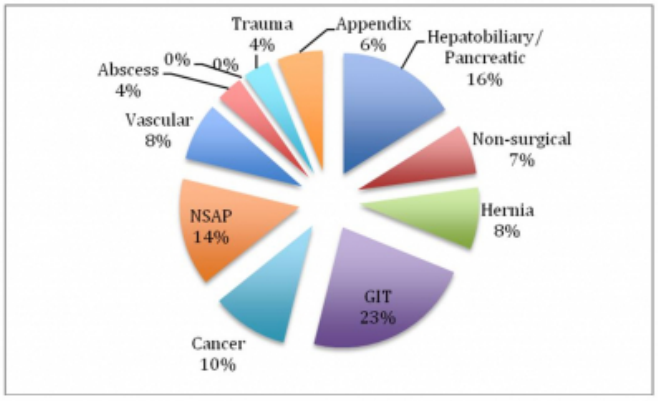
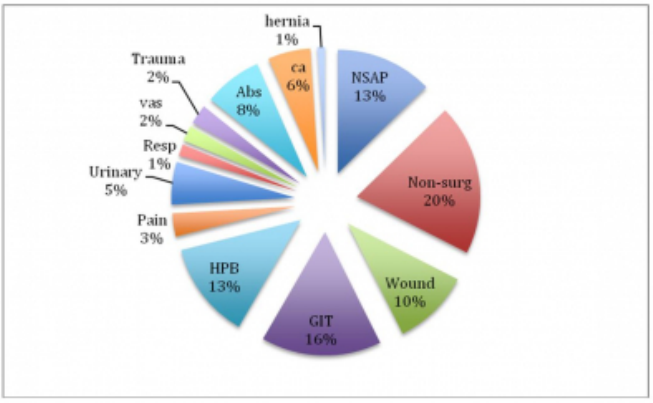


Figure 2

Pie chart showing the diagnostic groups on readmission



DISCUSSION

The study provides valuable information on surgical readmissions. This study suggests that majority of the readmissions were not related to the index admission diagnosis and were 'non-surgical'. Of the readmissions related to the initial surgical diagnosis, majority were due to post-operative complications; mainly gastro-intestinal and hepatobiliary pathologies. Post-operative pain and wound complications were the predominant post-operative problems noted. Fallacy of clinical coding contributed to a higher surgical readmission rate, which had obvious financial implications. The main drawback of the study is the small number of cases reviewed. We have also not looked at co-morbidities in individual patients, which might also influence readmissions. Details of individual social circumstances, support in the community and access to primary care were also not available for analysis, as these factors have some implications on the readmission rates (11).

One of the major causes of readmissions in our study was due to non-surgical causes. These patients presented with a different clinical problem not related to their surgical diagnosis at initial admission. Department of Health (DOH) defines readmission as any emergency admission occurring within 30 days of initial admission (1). This implies that any readmission irrespective of the diagnosis at initial admission would be categorized as a readmission under the surgical specialty, with exclusion criteria like cancer and obstetrics. This is most often due to a new pathology developing after discharge in our study. Readmissions are multifactorial and some reviews have shown that the causes of readmissions can be unrelated to the medical problems which necessitated the initial admission (12,13). It has been argued that confounding variables like chronic medical conditions might

influence readmission rates, which makes readmission rates not a very useful indicator of quality of care (8). This questions the validity of using readmission rate as a performance indicator of the healthcare provider. With huge financial implications, it makes it highly relevant to develop tools to identify confounding variables to evaluate readmissions more carefully.

The most common cause for readmissions in our study was gastrointestinal and hepatobiliary related pathologies, which contributed to nearly one-third of our cases (29%). There is some evidence to suggest colorectal and hepatobiliary surgeries are associated with an increased hospital readmission rate (14-18). Associated co-morbidities and post-operative complications have been implicated as important contributors to an increased readmission rate in this subgroup (15,19). An increased risk of post-operative wound infection with colorectal surgery has been implicated in an increased risk of readmissions, which was also seen in our study (20).

Nearly a fifth of the readmission in our audit was coded incorrectly, which not only increased the readmission rate, but also had financial implications. Coding errors do occur; however, policy-makers, planners and researchers need to recognize and account for the degree of inaccuracy in routine hospital information statistics (21). Data capture and accurate coding play a vital role in financial prudence. Clinicians are expected to play an increased role in improving and maintaining coding accuracy (http://www.connectingforhealth.nhs.uk/systemsandservices/data/clinicalcoding/noncoders). Data capture is still a weak link and it is unimaginable that any other company, which relies so heavily on coding accurately for its profits, would let such a system pass. There seem to be two major types of coding error - 1. The index procedure did not lead to the cause of readmission or the cause was due to malignancy. Therefore the trust should not have to pay this penalty. 2. The readmission was coded incorrectly as a surgical pathology or patient factors led to error in coding. With such a high cost as a result of these errors changes to the coding system must be recommended. In addition, regular departmental monitoring of readmission in order to flag unusually high numbers should trigger a review and re-audit of surgical readmissions.

The annual readmissions costs from our audit were estimated to be £ 1.7 million. A further analysis suggested a potential saving of approximately £ 0.5 million with either avoidance of short-term readmissions and avoiding coding errors.

Readdressing the definitions of readmission might add more to this cost estimate. Readmissions within a month of discharge cost the NHS £2.2 billion annually, which is nearly 2% of the annual NHS budget (22). 13% of all inpatients in the United States of America use more than half of all hospital resources through repeated admissions (23). This affects funding and in turn patient care (24).

Implications for change:

Following this audit, we have instituted an integrated surgical unit, which is a combined Surgical Assessment Unit (SAU) and 'Surgical Hot Clinic'. Patients requiring early review are brought back the very next day to a clinic that runs from 0900hrs to 1700hrs. This clinic hopes to reduce the anxiety often felt by clinicians and patients who benefit from early review, but cannot wait for a formal clinic appointment. Therefore high-risk patients are identified at discharge, with arrangements made for early follow-up in 'Hot clinics'. As pain is a major cause of re-presentation, a senior clinician will carry out a review prior to patient discharge in order to prevent subsequent readmissions due to inadequacy of analgesia. A patient information leaflet is designed to provide information on analgesia and contact information in the event of enquiry. The clinic seems promising and initial feedback has been extremely promising. Studies in medical specialties have suggested careful discharge planning, with an individualized plan of care and support may reduce unplanned readmissions (25,26). Close collaboration with primary care will also be effective in reducing readmissions (27).

It is clear that surgical readmissions not only lead to an increase in resource usage but also come with a significant financial burden to hospitals. We have demonstrated that there are several factors that are important to minimise the overall impact of what is a largely preventable cost.

CONCLUDING MESSAGE

Managing patients needing readmissions requires careful consideration and effective care pathways both in secondary and primary care. There are huge financial implications for healthcare providers, which need to be carefully evaluated.

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