Audit Of Readmission Following Non-Elective Surgical Management

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Citation

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Abstract

Introduction Readmission to hospital after elective or non elective treatment is often used as a measure of the quality of care as patient experience is improved by keeping visits to hospital to a minimum. The aim was to determine the reasons for readmission and identify what measures can be applied to reduce it.Methods All emergency surgical admissions for one year (April 2009 to March 2010) were included in the study. Of a total number of 6305 surgical admissions, 1712 were excluded (1655 admitted electively and 57 readmitted elsewhere) leaving 6148 for analysis.Results The uncorrected readmission rate was 15.4% (954/6205) whereas the true readmission rate was 8% (494/6148). The duration of initial admission or whether patients had diagnostic or therapeutic intervention did not significantly influence readmission. The overall readmission rate for biliary tract disorders was 6.85% but for those undergoing emergency cholecystectomy, the rate was 2.4%. The readmission rate after appendicectomy was 6.7% (25/373). Conclusions Readmission following emergency appendicectomy and cholecystectomy compare favourably with UK national statistics. Measures should be adopted to increase the proportion of acute patients undergoing emergency cholecystectomy. This study reiterates the need for a clear definition of and detailed categorisation of readmissions to allow accurate comparisons in the future.

INTRODUCTION

Analyses have shown that 5-7% of patients discharged from NHS hospitals are readmitted as an emergency within 28 days [1]. Readmission to hospital after elective or non-elective treatment is often used as a measure of the quality of care as patient experience is improved by keeping visits to hospital to a minimum [2]. Readmission carries with it associated risks and discomfort for patients and has cost implications to the National Health Service. When readmission happens within 28 days of discharge, it is regarded as part of the original treatment spell and consequently not paid for separately [3]. Given the link to payment, it becomes important to ascertain the true incidence of readmission for various conditions, particularly the common ones. Dr Foster, UK's leading provider of comparative information on health and social care services [4] raised concern that our institution was an outlier regarding readmission following emergency surgical care prompting this study. The aim was to determine the reasons for readmission and identify what measures can be applied to reduce it.

PATIENTS & METHODS

All emergency surgical admissions for one year (April 2009 to March 2010) were included in the study. Dr Foster's list of 954 readmitted cases was amalgamated with 6906 from the hospital database of non-elective admissions during the same period who had no readmission spells. The diagnostic category, type of diagnostic or therapeutic intervention, duration of stay during the index/initial admission, migration between hospital consultants or specialty groups and readmission to hospital within 28 days of discharge were all recorded. The reason for readmission was also recorded. Patients readmitted to other hospitals or electively for a planned procedure were excluded from analysis.

Of a total number of 6906 surgical admissions, 1655 were excluded as they were admitted electively leaving 5251 for analysis while of 954 readmissions from Dr Foster's list, 57 who were readmitted elsewhere were excluded. The total number of cases analysed was therefore 6148. True readmission was defined as admission within 28 days with the same condition or due to a complication of procedure performed during the index admission. Readmissions with a new surgical problem or to a different specialty with an

unrelated problem were considered false readmissions. Readmissions to other hospitals were excluded as it was not possible to determine whether they were true or false readmissions. Statistical analysis of the influence of various factors on readmission were performed using chi-square analysis or Student t test with a p-value <0.05 taken as significant. Comparison was also made with the UK Department of Health (DOH) data.

RESULTS

Of the 6205 non elective admissions, 954 were readmitted within 28 days giving an uncorrected readmission rate of 15.4%. Fifty-seven of these were to other hospitals and were therefore excluded leaving 897 for analysis. There were 494 true readmissions including 434 patients with the same condition, 51 with complications of surgery and 9 miscellaneous conditions giving a true readmission rate of 8% (494/6148).

The duration of initial admission was not significantly different between those readmitted and those not readmitted within 28 days (t = 0.5881; p = 0.5565, Table 1). Seven percent (412/5897) of patients whose initial admission was under the care of the same consultant were readmitted whereas 32.7% (82/251) of patients discharged from the care of a different consultant were readmitted (Yates' x^2 = 211.439; df = 1; p < 0.0001).

Forty percent (2430/6148) had either a diagnostic or therapeutic procedure performed during their first admission. The true readmission rates according to whether a procedure was performed and not performed were 7.2% (175/2430) and 8.8% (319/3718), respectively. Diagnostic/therapeutic intervention during initial admission significantly reduced the rate of readmission (Yates' x^2 = 3.593; df = 1; p = 0.054). Seventy-six percent (377/494) of true readmissions occurred within 2 weeks. The mean±SEM time from discharge to readmission was 9.1±0.35 days (median 6 days) for true readmission compared to 10.5±0.38 days (median 9 days) for false readmissions (t = 2.7049; p = 0.007)

The top ten categories relate to the original emergency admission of 6148 patients and the true readmission (second admission) of 494 patients. This indicates that abdominal pain, post-operative complications, pancreatico-biliary problems are common reasons for readmission (Table 2).

The overall readmission rate for biliary tract disorders was 6.85% (27/394) but for those undergoing emergency cholecystectomy, the rate was 2.4% (2/83). There were no statistically significant differences in the distribution of readmission according to diagnostic or therapeutic intervention (Yates' x^2 = 0.704; P = 0.401) (Table 3). The readmission rate after appendicectomy was 6.7% (25/373). There were no statistically significant differences in the distribution of readmission according to surgical intervention (Yates' x^2 = 0.001; P = 0.974) (Table 4).

Figure 1

Table 1: Length of initial admission (days)

Length of initial admission	No readmission N = 5251	True readmissions N = 494
Range	0 – 371	0 - 44
Mean admission length	3.2	2.9
Standard error of mean	0.12	0.22
Median admission length	1	1

Figure 2

Table 2: Common categorical classification of true readmissions

First admission	%	Second admission	%
Abdominal pain	31.4	Abdominal pain	17.6
Complications of surgical procedures or medical care	10.5	Complications of surgical procedures or medical care	17.6
Pancreatic disorders (not diabetes)	7.9	Pancreatic disorders (not diabetes)	10.1
Biliary tract disease	5.5	Biliary tract disease	6.9
Appendicitis and other appendiceal conditions	5.3	Anal and rectal conditions	5.1
Anal and rectal conditions	5.1	Skin and subcutaneous tissue infections	3.6
Skin and subcutaneous tissue infections	4.7	Other gastrointestinal disorders	3.4
Genitourinary symptoms and ill-defined conditions	2.4	Genitourinary symptoms and ill-defined conditions	2.6
Other gastrointestinal disorders	2.4	Urinary tract infections	2.6
Urinary tract infections	2.2	Complication of device; implant or graft	2.6

Figure 3

Table 3: Biliary tract disorders

	No readmission	True readmissions	Total	%
ERCP +/- sphincterotomy	58	6	64	16.2
Cholecystectomy (laparoscopic and open)	81	2	83	21.1
Other surgical procedure (related to biliary tract)	4	0	4	1
Other surgical procedure (not related to biliary tract)	3	0	3	0.8
No surgical procedure	221	19	240	60.9
Total	**367**	**27**	**394**	**100**

ERCP = endoscopic retrograde cholangio-pancreatography

Figure 4

Table 4: Appendiceal conditions

Appendicitis	No readmission	True readmissions	Total	%
Appendicectomy (laparoscopic and open)	348	25	373	98.2
No surgical procedure	6	1	7	1.8
Total	**354**	**26**	**380**	**100.0**

Figure 5

Table 5: Comparison of readmission figures

HRG Description	Index admissions	True readmissions	Readmission rate	Comments
General abdominal disorders<70	106,722	11,366	10.7	DOH data for 2006/7
General abdominal disorders >69	40,048	6,041	15.1	DOH
General abdominal disorders (overall)	146,770	17,407	11.9	Rate calculated by combing two rows above
General surgical problems	5251	494	9.4	Derriford (April 2009 – March 2010)
Excision of gallbladder	31,748	1,760	5.5	DOH
Excision of gallbladder (laparoscopic or open)	83	2	2.4	Derriford (April 2009 – March 2010)
Emergency excision of appendix	23,033	1,625	7.1	DOH
Emergency excision of appendix	373	25	6.7	Derriford (April 2009 – March 2010)

HRG = health related group; DOH = Department of Health, United Kingdom

DISCUSSION

Readmission following surgical care appears to be increasing. DOH statistics (Table 5) show an increasing trend of emergency readmissions – for patients <70 years, emergency readmission for general abdominal disorders increased from 9.2% during 2003/4 to 10.7% during 2006/7 [5]. The Poole Hospital NHS audit data reported that the readmission rate for General Surgery was 10.5%, 2.8% higher than the expected figure. Three other local peer hospitals demonstrated higher readmission rates than expected [6]. Increased number of readmissions in recent years could be due to referral to the hospital (especially out of hours) by cover doctors rather than patient's own GPs. Some have suggested that the length of hospital stay during the initial admission directly influences readmission rates [7]. In our study, however, the duration of initial admission did not appear to influence the readmission rate ($p = 0.5565$) inferring that overzealous discharges may not be a major

factor responsible for readmissions. The key factors predicting readmission to hospital include age, gender, previous admission and clinical condition [8]. Khan and co-workers [9] found that increasing age was a risk factor for readmission.

It is not clear why patients transferred to or discharged by another consultant were more likely to be readmitted (P = 0.05) in our series. It is speculated that this may be due to the need for further diagnostic or therapeutic intervention as such patients might have either unconfirmed diagnosis or require further diagnostic or therapeutic intervention as part of their management.

Our study shows that readmission following emergency appendicectomy and cholecystectomy compare favourably with DOH statistics (Table 5). The readmission rate after appendicectomy in this study is similar to the rate of 6.07% for 461 patients undergoing open appendicectomy between 2007 and 2009 in Pakistan [10]. However, other studies report a lower readmission rate of 4.6% [11,12]. Pokala and co-workers demonstrated a higher readmission rate for complicated appendicitis treated by laparoscopic surgery compared to open surgery - 11.6% (5/41) versus 4.9% (3/61), respectively [13]. Measures should be adopted to increase the proportion of acute patients undergoing emergency cholecystectomy. A "hot" gallbladder service has been instituted in our institution to enable patients with biliary colic, cholecystitis or mild acute pancreatitis to undergo timely cholecystectomy. A number of surgeons have volunteered to provide this service and through the slots in the dedicated emergency theatre or additional slots which may be present at short notice from lists finishing early, such patients would undergo their definitive procedures.

This analysis has important limitations as it did not include information on patients' social circumstances. We were not able to analyse the effect of patients' ages and the accuracy of clinical coding could not be verified in all the cases. It was also not possible to assess the effect of recent measures in the hospital to reduce follow-up on readmission rates. Increasingly patients are advised upon discharge to contact their general practitioners if they had any concerns. Discharge letters often do not contain adequate information of what to do in the event of continuing symptoms or complication and so patients by default return to hospital. It was not possible to analyse the reasons for transfer to other consultants/specialities due to the retrospective nature of the study.

To reduce readmission rates, a clear care plan for each patient on discharge is mandatory and adequate resources must be made available in the community to enable general practitioners to manage most problems not requiring secondary care input. This study reiterates the need for a clear definition and detailed categorisation of readmissions. Patients who attend the Surgical Assessment Unit and are attended to without being admitted overnight in hospital should not be regarded as readmissions but as "ward attenders". It is possible that some readmissions with a different diagnostic category may be due to failure to make the right diagnosis during the initial admission. It is difficult to determine how many readmissions are linked to the original treatment and caution must be exercised in regarding readmission rates as a measure of quality of care. In this study we have distinguished between "true" and "false" readmissions in a retrospective manner but to allow accurate comparisons in the future it is important to have a DOH-defined classification system. The broad categories of such a system should include:

CONCLUSION

An overall true readmission rate of 8% following non elective surgical admissions in this series is within reasonable limits and is less than the computed DOH rate of 11.9% for general abdominal disorders. This is especially so taking into account that elective and day-case surgical cases usually associated with low readmission rates have been excluded. It is possible to reduce this rate even more by increasing the proportion of gallbladder patients undergoing their definitive operation during the initial admission. This obviously has implications for other services like radiology that need to provide timely diagnostic imaging.

References

1. Emergency readmission to hospital following discharge. http://www.chi.nhs.uk/Ratings/Trust/Indicator/indicatorDescriptionShort.asp?indicatorId=1026
2. Healthcare Commission. NHS performance ratings 2003/2004. London 2004
3. Roberts M: Hospitals to face financial penalties for readmissions. http://www.bbc.co.uk/news/10262344
4. http://www.drfosterhealth.co.uk/docs/hospital-guide-2010.pdf
5. Emergency readmission rates: further analysis. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_090053
6. Readmissions Audit - Poole Hospital NHS Foundation Trust. http://www.poole.nhs.uk/about_us/board_meetings/July_2007/papers/TB%20July%20K%20-%20Readmissions%20Audit.pdf
7. Williams S, Bottle A, Aylin P: Length of hospital stay and subsequent emergency readmission. BMJ; 2005; 331(7513):

371.
8. Billings J, Dixon J, Mijanovich T, Wennberg D: Case finding for patients at risk of readmission to hospital: development of algorithm to identify high risk patients. BMJ; 2006; 333(7563): 327. doi: 10.1136/bmj.38870.657917.AE).
9. Khan SA, Stephens LR, O'Riordan D, Rothwell J: Impact of patient related factors on readmission and overstay rates following laparoscopic day case inguinal hernia repair. Surg Chronicle; 2011; 16: 91-95.
10. Shaikh AR, Khatoon S, Arif M: Evaluation of re-admission after open appendicectomy. Rawal Med J; 2011; 36: 100-103.
11. Henderson J, Graveney MJ, Goldacre MJ: Should emergency readmissions be used as health service indicators and in medical audit? Health Serv Manage Res; 1993; 6: 109-116.
12. Bisset AF: The case for clinical audit of emergency readmissions afterappendicectomy. J R Coll Surg Edin; 1998; 43: 257-261.
13. Pokala N, Sadhasivam S, Kiran RP, Parithivel V: Complicated appendicitis--is the laparoscopic approach appropriate? A comparative study with the open approach: outcome in a community hospital setting. Am Surg; 2007; 73: 737-741; discussion 741-742.

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