Impact of a care pathway in acute pancreatitis

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Background Previous studies have shown that accurate process of care predicts quality of care. Few examples currently exist for process of care for the acute surgical patient. A recent region wide audit had identified good outcomes for patients with acute pancreatitis at our institution but aspects of care that could be improved.

Methods For this re-audit, a simple written care pathway for the management of those presenting with acute pancreatitis was introduced in our institution from February to July 2009.

The audit standards were set against the British Society of Gastroenterology (BSG) guidelines for management of acute pancreatitis and were compared with the previous region wide audit.

Results Marked improvements were noted in the rates of abdominal imaging achieved within 24 h of diagnosis (35.2% vs 47.7%), severity stratification within 48 h of diagnosis (28.7% vs 75%), critical care admission for those classified as severe (39.3% vs 63.6%) and definitive treatment during index admission (22.2% vs 38.5%). Survival rates were 100% for this audit cycle and 95% for all patients within the region wide audit. Despite these improvements, care still does not reach the standards set out by BSG.

Conclusion Predefined processes of care may help to recognise those developing or likely to develop severe pancreatitis, ensure accurate documentation of severity, expedite critical care review and/or admission, and help to encourage the timely management of those with a treatable underlying cause of their pancreatitis.

Introduction

Acute pancreatitis represents a significant proportion of workload for all general surgical departments responsible for the admission of emergency patients. The incidence has been shown to be as high as 56.5 per 100 000 in a recent study¹ and seems to be increasing.² Most pancreatitis is mild and self-limiting but approximately 20% of cases are severe where mortality can approach 40% with infected necrosis.³

Optimal management of acute pancreatitis has been defined in evidence based national guidelines by the British Society of Gastroenterology (BSG).³ The results

of our unit's performance have recently been reported as part of a 6 month audit of management of pancreatitis undertaken by Ellis *et al* in our regional hepatobiliary unit.¹ This audit retrospectively identified all patients with hyperamylasaemia and audited their clinical record against BSG guidelines³ for management. They identified 963 patients region wide over 6 months of which 58 cases were from our unit. The results for our unit demonstrated good survival and good time to diagnosis. However, there were specific aspects of care which could be improved, specifically severity stratification and endoscopic retrograde cholangiopancreatography (ERCP) in those with acute severe pancreatitis of gallstone aetiology.¹

Care pathways prescribe the steps in care for specific patient groups. Care for all patients with a condition or undergoing a specific procedure or investigation is standardised. Deviations from the care pathway should only occur for good reason. Care pathways have been demonstrated to reduce cost with equivalent or better clinical outcomes for a variety of elective surgical procedures.^{4–6} In emergency patients, improved outcomes in terms of faster resuscitation, faster diagnosis and faster transfer from the emergency department have been shown in multiple trauma patients after introduction of a care pathway.⁷

It has also been shown in unselected general surgical emergency patients that measurement of process of care could be used as an accurate surrogate for quality of care.⁸ Furthermore, that increasing awareness of correct process of care increased quality of care and decreased errors in management.⁸

We hypothesised that introduction of a pathway of care for acute pancreatitis may increase awareness of best practice and improve performance against guidelines for management to improve severity stratification, access to abdominal imaging and ERCP rates for severe gallstone pancreatitis.

Methods

We introduced a clinical care pathway for patients presenting with acute pancreatitis and then performed a re-audit. Outcomes were measured against national guidelines.³ We measured rates of correct diagnoses made within 48 h of admission and rates of positive aetiology determination. Data on severity stratification performed within 48 h and initial abdominal imaging for gallstones within 24 h of diagnosis were also collected. Additional data on those with severe acute pancreatitis were collected, including the following: rates managed in critical care, rate of those with gallstone aetiology who had ERCP performed within 72 h, number who had a CT at 6–10 days to assess necrosis and overall mortality. All data collected are listed in table 1.

A simple flowchart for management of acute pancreatitis based around BSG guidelines³ was designed and approved by the senior authors for the department of surgery. Together with this was a proforma for basic data collection to be filled in by treating clinicians prospectively (online supplementary figure 1). The study team made medical and nursing staff aware of the new pathway during the pilot period although no formal training in its use was deemed to be required. The pathway and data collection proforma was designed as a single sheet to be kept in the first page of each patient's drug kardex to allow easy data collection at ward rounds. Data collection was continued until hospital discharge. Where patients were transferred to our regional hepatobiliary unit, the study team monitored their progress through communication with the unit. This was piloted over 2 weeks and then rolled out for all patients with acute pancreatitis presenting to North Tyneside General Hospital. Data for our re-audit were collected for 6 months from 1 February 2009 to 31 July 2009. Our results were compared with a previous regional audit by Ellis *et al* that had used the same data fields.¹ Approval for this audit was gained from the trust audit department.

Statistical analysis

Percentages of patients meeting each target were calculated and compared with previous audit data with Fisher's exact test using SPSS. A *p* value <0.05 was considered significant.

Results

In our re-audit period, 44 patients were admitted with a diagnosis of acute pancreatitis of whom 13 had severe acute pancreatitis (SAP). Two of the severe cases of pancreatitis became 'severe' due to clinical progression after 48 h and so the group that is considered for immediate critical care admission according to the BSG guidelines³ only comprised 11 patients. Seven patients with SAP had gallstone aetiology. The population of Ellis *et al*'s audit¹ (our control population) comprised 58 patients, 13 of whom had severe pancreatitis. Six of the severe cases of pancreatitis had a gallstone aetiology.

Comparisons of results between the re-audit after introduction of the care pathway and the previous audit are summarised in table 1. Diagnosis within 48 h was similar (100% vs 96%; *p*=0.18). The prior audit only included patients if they had a hyperamylasaemia recorded. In our audit, we included all diagnoses of pancreatitis, irrespective of method of diagnosis. Both patients who did not have their diagnosis made within 48 h had been admitted to non-surgical wards with 'chest pain' and not had their amylase checked. Diagnosis was made on subsequent CT scanning.

Abdominal imaging within 24 h improved after introduction of the care pathway from 31% to 48%, although this was not statistically significant (*p*=0.10). The rate of severity stratification improved significantly after introduction of the care pathway from 22% to 75% (*p*<0.01). The rates of aetiology determination were already high in this unit and did not change, and survival was 100% in both groups.

In the smaller subgroup of severe pancreatitis (*n*=11), admission rates to critical care increased from 31%

Table 1 Compliance with guideline recommendations in the management of acute pancreatitis³

	Prior audit ¹	Re-audit	BSG (%) ³	<i>p</i> Value
Diagnosis within 48 h	100% (58/58)	96% (42/44)	100	0.18
Abdominal imaging within 24 h	31% (18/58)	48% (21/44)	100	0.10
Severity stratification within 48 h	22% (13/58)	75% (33/44)	100	<0.01
Aetiology determined	88% (51/58)	86% (38/44)	80	1.00
Survival	100% (58/58)	100% (44/44)	>90	1.00
Severe pancreatitis				
Critical care admission	31% (4/13)	64% (7/11)	100	0.22
CT scan	46% (6/13)	46% (6/13)	100	1.00
Urgent ERCP for gallstone AP	0% (0/6)	43% (3/7)	100	0.19
Survival	100% (13/13)	100% (13/13)	>70	1.00

AP, acute pancreatitis; BSG, British Society of Gastroenterology; ERCP, endoscopic retrograde cholangiopancreatography.

to 64%, although this was not statistically significant ($p=0.22$). CT scan rates remained the same. However, urgent ERCP rates increased after introduction of the care plan from 0% to 43%. While this seemed a clinically significant improvement, small numbers prevented this reaching statistical significance but this has face validity ($p=0.19$).

Discussion

As the costs and expectations of medical care rise, the challenge to provide high quality, cost effective health-care remains great. Choices in healthcare must be made through the careful application of resources which have been proven to have a measurable effect on patient outcome. Managed care, a system whereby patients follow a standardised care pathway for a defined disease process, has been introduced to attempt to maximise quality of care and efficiency for problems that are either high volume and/or complex.⁶

Pancreatitis represents a significant bulk of the workload of the on-call general surgeon¹ and by its nature can give rise to patients with a very simple management pathway through to those requiring complex diagnostic and therapeutic procedures from a range of clinicians.³ The BSG guidelines for pancreatitis were an effort to streamline the diagnosis and management of pancreatitis and to set out expected levels of morbidity and mortality.³

Our study showed a clear trend towards improvement in the management of those with acute pancreatitis. Continued use of the pathway would be expected to continue to improve measurable outcomes of our care process. Stevenson *et al* clearly showed that although simple knowledge of being observed did not change error rate among health professionals, increased awareness of correct or suggested management (eg, through a care pathway) significantly reduced the error rate reflecting improved quality of care.⁸

Our study was limited by the small sample size, particularly for those classified as having severe pancreatitis. Relative to our previous audit, fewer patients developed severe compared with mild pancreatitis. The increased rates of critical care admission and urgent ERCP may well represent earlier recognition of severe pancreatitis due to improved rates of severity stratification or improved staff knowledge of the correct process when using the care pathway. Whether the static rate of CT scanning within the time frame suggested represents lack of availability of CT or whether by the time of CT management has progressed beyond the limitations of a care pathway for acute pancreatitis requires further investigation. We plan to use data from the re-audit to make a case for improved provision of CT and ERCP in our unit.

Overall the introduction of a care pathway in acute pancreatitis has resulted in faster identification of

a likely cause and stratification of severity. Critical care admission for those who need it is increased, as is urgent ERCP within the 72 h window, perhaps as a result of recognising the need for ERCP more quickly. It would require a much larger study to comment on whether survival rates are affected by a care pathway but our study certainly suggests that a care pathway 'focuses the mind' of those caring for patients with acute pancreatitis and raises the standard of care that patients receive. Improvements in process of care are reflected in quality of care.⁸ In conclusion, our care pathway in acute pancreatitis has helped in stratifying decision making and raised quality of care.

Contributors All authors designed the study, IJDMcC and GJH collected and analysed the data. The manuscript was revised by SA and KS.

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Competing interests None.

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