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Kamal Aryal, Arnab Bhowmick, Alan Beveridge, Nigel A. Scott

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Hotel NHS and the Acute Abdomen

– admit first, investigate later.

Kamal Aryal, SpR General Surgery
Royal Preston Hospital, Preston

A Bhowmick, Consultant Colorectal Surgeon,
Royal Preston Hospital, Preston

AJ Beveridge, Consultant Colorectal Surgeon,
Royal Preston Hospital, Preston

NA Scott. Consultant Colorectal Surgeon,
Royal Preston Hospital, Preston

(* correspondence to
Mr Nigel Scott
Royal Preston Hospital
Preston
PR2 9HT
nigel.scott@lthtr.nhs.uk – 01772 522261)

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Aim

To determine for patients with an admission diagnosis of suspected acute abdomen, the financial consequences of a policy of admission first –followed by definitive investigation.

Results

Over a one month period 122 patients were admitted with a suspected surgical diagnosis of acute abdomen - (55 male, 67 female); age range 16 to 95 years (median 56.5). Based on either surgical operation required (n=36), death after admission (n= 6 - 3 postoperative deaths) and/or severe surgical illness (n=17) – 56 required surgical in-patient admission, while 66 did not. Those patients that did not require admission, spent significantly shorter time in hospital than those that required admission (median 5 days v 8.5 days; p=0.0000).

Total hospital hotel and investigation cost (not including ITU or theatre costs) for all 122 patients was £330,468. Overall £205,468 was consumed by those 56 patients that required admission whilst £125,000 was spent on 66 patients whose clinical course did not justify admission – 92% of which was spent on hospital hotel costs and 8% on the cost of imaging and/or endoscopy.

Discussion and Conclusion

On a national basis, emergency General Surgery admissions account for 1,000 Finished Consultant Episodes per 100,000 population. The findings of

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this study suggest that this equates to a national NHS spend of £650 million each year, for the hotel costs of patients that could arguably avoid surgical admission altogether. Continuing to admit patients with a suspected acute abdomen first - and then requesting definitive investigation makes neither clinical nor economic sense.

KEY WORDS: Acute Abdomen, Surgical admission, NHS cost

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What's already known about this topic?

- Current UK surgical practice, admits patients with abdominal pain but no surgical disease, who wait as inpatients for definitive investigation.
- CT scanning before surgical admission rapidly and accurately identifies those patients that do not require admission

What does this article add?

- Quantifies the "hotel costs" of current UK emergency surgical practice
- Estimates the national cost of this practice as £650 million – this could be better used in expanding access to definitive imaging before admission

Introduction

Emergency general surgical admissions comprise the largest group, by a considerable majority, of all surgical admissions in the UK (1). Clinical assessment of the acute abdomen aims to select for admission, those patients that require operation and/or support of critical surgical illness. However, based on clinical assessment alone, different groups of doctors vary widely in their views about the need for emergency surgical admission (2).

Traditional UK surgical assessment before admission is based on clinical examination, with plain abdominal films and laboratory investigations. Definitive imaging and/or endoscopy is usually instituted after patients have been admitted. Thus, patients that neither require surgical intervention nor critical illness support, incur "hotel costs" for board and accommodation while awaiting their definitive investigation. The aim of this study was to determine, for a cohort of patients with an admission diagnosis of acute abdomen, the financial consequences of a policy of admission first –followed by definitive investigation.

Patients and methods

Adult patients admitted to the Surgical Assessment Unit (SAU) of Royal Preston Hospital (RPH) with the diagnosis of acute abdominal pain were studied prospectively over a one month period. Patients with non-acute abdomen surgical problems (e.g. superficial abscesses) and vascular diagnoses were excluded. Details of clinical presentation, provisional diagnosis, results of blood tests including white cell count, haemoglobin, liver

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function tests, serum amylase and CRP were prospectively collected. Definitive investigation details, (ultrasound scan (US), Computerised Tomography (CT) scan and endoscopy) during the admission, **final diagnosis and where relevant operation description and cause of death were obtained.**

Based on the clinical presentation, investigations and final outcome, patients were divided in to two groups. Those that underwent surgery, died after admission and/or had severe surgical illness – clearly required surgical admission. The remainder of the admitted patients – neither critical illness support nor surgical intervention - were defined as not requiring surgical admission. Hotel costs for individual patients were based on hospital bed cost per admission day (£324) and investigation cost (Ultrasound scan - £122; CT scan - £276; Gastroscopy - £197; Flexible Sigmoidoscopy - £200; Colonoscopy - £250; ERCP - £552). Comparison of the two defined patient groups was performed using the Mann Whitney test, using SPSS software (v14).

Results

122 patients were admitted with a suspected surgical diagnosis of acute abdomen - (55 male and 67 female) with age range 16 to 95 years (median 56.5) over the one month period. Based on one or more of the criteria of either surgical operation required (n=36), death after admission (n= 6 - 3 postoperative deaths) and/or severe surgical illness (n=17) – 56 required surgical in-patient admission, while 66 did not (TABLE 1).

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Median age and patient gender was virtually identical for the two groups. Those patients not requiring admission, spent a significantly shorter time in hospital than those that required admission (median 5 days v 8.5 days; p=0.0000). Overall 79 (65%) patients underwent 91 imaging and/or endoscopy investigations. The inpatient time waiting (2 days) for definitive imaging/endoscopy investigation was similar for both patient groups (TABLE 1).

Total hospital hotel and investigation costs (not including ITU or theatre costs) for all 122 patients were £330,468. Overall £205,468 was consumed by those patients requiring admission whilst the remainder was spent on 66 patients whose clinical course – no operation, no critical illness and no mortality - did not justify admission. The total cost of these latter 66 patients, discharged without surgical intervention was £125,000 – 92% of which was spent on hospital hotel costs while 8% represented the cost of imaging and/or endoscopy.

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Discussion

Emergency presentation is the most common reason for admission to a surgical bed in this country (3). During the course of a single month, a busy surgical unit spent £330,468 investigating and accommodating 122 patients admitted as an emergency with a suspected diagnosis of an acute abdomen. Approximately 40% of this cost (£125,000) was expended on the “hotel costs”

of 54% of the admissions, who neither required surgical intervention nor support of critical surgical illness.

Nationally, emergency General Surgery accounts for approximately 1,000 Finished Consultant Episodes per 100,000 population (4). Based on this study, this activity equates to a UK emergency surgery hotel and investigation cost of £1620million per annum. Further this study would suggest that £650 million of this expenditure is used each year for the hotel costs of patients that could arguably avoid surgical admission altogether.

The problem of costs associated with admission of patients with non-surgical abdominal pain, has been described previously – in 1992 being estimated at £807 per patient compared with £1900 per patient in this study (4). However, in the past expenditure on hotel costs while excluding a significant surgical diagnosis was unavoidable – as conventional radiology followed by repeated clinical inpatient observation was the only definitive diagnostic approach available.

A significant difference now, is access to immediate and accurate early cross sectional imaging for acute abdominal pain (5). **Conventional** radiology of the acute abdomen is associated with a diagnostic sensitivity and accuracy of 30.0% and 56.0% - unenhanced helical CT assessment in the same patients produces a diagnostic sensitivity and accuracy of 96.0% and 95.6% (7) Thus acute abdomen diagnosis can now be rapidly and reliably established by definitive investigation before admission (6-8).

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As importantly, employing definitive investigation before the decision to admit - reduces the number of unnecessary surgical admissions (9-11). In a study of CT based decision making in elderly patients with acute abdominal pain, 23/104 (32%) could be discharged after the results of the CT were known (10). Similarly, of 273 patients clinically suspected to have underlying abdominal diagnoses requiring admission to the hospital - 47% (127 of 273) had negative CT results and 38% (104 of 273) were discharged without surgical admission (11). In the context of this study, an annual national saving in NHS "hotel" costs of £247milion.

Assessment of patients with acute abdominal pain is complex. Clinical evaluation of the acute abdomen will continue to have a central role, albeit within a climate of uncertain surgical experience and expertise (12). A significant reduction in hospital surgical admissions may also require expenditure on the development of community services to support patients sent home with significant symptoms but no cause for surgical intervention (13-15). Moreover, placing definitive radiological imaging as the gatekeeper of surgical admission will require algorithm development (16) and measures to minimise inter-observer error in imaging interpretation (17). However, to continue to admit patients with a suspected acute abdomen first - and then ask for definitive imaging, at an annual NHS hotel cost of £600million per year, makes little sense.

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TABLE 1

	Required admission n=56**	Did not require admission n=66	p
Gender	0.6M:1F	0.78M:1F	ns
Age (median) range	59 (16-94)	53.5 (16-95)	ns
Hospital stay (median) Range	8.5 (1-57)	5 (1-21)	0.0000
Time to definite investigation (median) Range	2 1-9	2 1-12	ns
Investigations CT scan USS Endoscopy	 22 13 6	 27 17 4	
Hospital Costs	£205,468	£125,000	

**[surgical operation required (n=36), death after admission (n= 6 - 3 postoperative deaths) and/or severe surgical illness (n=17) - Pancreatitis (8), Acute Cholecystitis(2), Biliary stricture (1),GI bleeders(2), Adenocarcinoma of small bowel(1), Colitis (1), Carcinoma oesophagus(1), Pelvic inflammatory disease (1)]

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