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Title page

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Nonagenarian Surgical Admissions for the acute abdomen: Who benefits?

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ABSTRACT

Introduction

Patients 90 years and older, form an increasing proportion of the general population. Outcomes of their acute surgical admissions are not well documented.

Methods and Materials.

Surgical management of 49 consecutive nonagenarian admissions (median age 92yrs) with an acute abdomen compared to the management and outcome of 50 younger patients (median age 53.5) admitted with a suspected acute abdomen over the same period.

Results

Nonagenarian group were mainly female (71% v 50% p=0.003). The use of laboratory investigations and imaging was similar for the patients aged over 90 and the younger patients – although proportionately fewer nonagenarians were investigated by abdominal CT scan (8% v 24%).

Of the 49 nonagenarian patients admitted, only 4% (n=2) were operated on. By contrast, 38% (n=19) of patients aged 50-59 (P=0.0001) underwent a surgical intervention.

A much greater proportion of nonagenarians died in hospital than patients in the 50-59 comparator group (16% nonagenarians versus 4% comparator patients; p=0.04). The very large majority of survivors in both age groups were

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discharged back to their pre-admission domicile (39 (95%) nonagenarians versus 46 (96%) comparator 50-59 year group).

Conclusions

In this study, when compared with younger patients very few nonagenarian patients (2%) with a suspected acute abdomen benefited from surgical admission. Instead the large majority of nonagenarians either died or were discharged back to their home address without surgery.

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What is known about the topics?

- Nonagenarians represent a growing part of the population.
- Nonagenarian acute surgical admissions have increased and are likely to increase further.
- Selected patients in their nineties can be successfully operated on as emergencies and discharged from hospital alive.

What does this study add?

- Most Nonagenarians are unlikely to benefit from hospital surgical admission.
- Palliative treatment must remain a major consideration for nonagenarians with significant comorbidity and/or severe surgical illness.
- Future admission protocols for nonagenarians with a suspected acute abdomen should usefully incorporate assessment of “illness severity” before the decision to admit.

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INTRODUCTION

The number of nonagenarians in England and Wales continues to increase (1). An inevitable consequence of this increase in life expectancy is an increasing workload of surgical illness amongst the very elderly. (2) While the outcomes of surgery in selected elderly patients are well documented (3-6), less clear is whether the overall management of the nonagenarian acute abdomen, including the frequency of the decision to operate, is the same as in younger patients.

In this study we documented the surgical management of nonagenarians and a younger (50-59 years old) comparator population admitted with a diagnosis of an acute abdomen to the same hospital over the same time period. Our aim was to determine if the management and outcomes of the nonagenarian acute abdomen differ significantly from those of younger patients.

METHODS AND MATERIALS

49 consecutive patients aged 90 years or over with a clinical diagnosis of acute abdomen, were admitted during a nine month period (2007) to the Surgical Assessment Unit at Royal Preston Hospital. Over the same period 306 patients aged between 50 and 59 years of age were also admitted with an acute abdomen. For the purposes of this study, a “young” comparator population (n=50; median age 53.5 yrs) was selected from every sixth admission in this latter age group.

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Each patient had details of age, gender and pre-admission domicile recorded. In addition details of the use of laboratory and radiological investigations, surgical operations, length of stay, outcome and discharge destination were collected. The nonagenarian population and 50-59 year comparator population were compared, to determine any differences in the use of investigations, surgical intervention and outcome, including final discharge address from the hospital. Chi square test was used for comparison between the two groups.

RESULTS

Patients and Management.

The nonagenarian group had significantly more females (71%) than the comparator group (50%). The frequency of haematological and biochemical investigations was the same for patient groups as was the use of chest radiographs, abdominal films and abdominal ultrasound. However, significantly fewer nonagenarians underwent CT scan. (Table 1)

Of the 49 nonagenarian patients admitted, only 4% (n=2) were operated on, one had a Hartmann's procedure for perforated diverticular disease and one died after a repair of an incarcerated femoral hernia. By contrast, 38% (n=19) of patients aged 50-59 (P=0.0001) underwent a surgical operation.

Outcome

The median hospital stay for the nonagenarians was very similar to that of the 50-59 age group (Table 2). However, a much greater proportion of nonagenarians died in hospital than patients in the 50-59 comparator group

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(16% nonagenarians versus 4% comparator patients; p=0.04). The same proportion of surviving nonagenarians and younger comparator patients were discharged back to their original home address. Table 3 summarises the pre-admission and post-discharge domicile of the nonagenarian group. The discharge diagnoses of the nonagenarian group are summarised in Table 4.

DISCUSSION

Not surprisingly, female patients predominate amongst very elderly patients admitted with a suspected acute abdomen (6). In addition, we found the use of laboratory and most radiological investigations in nonagenarians, to determine the cause of the acute abdomen, was both similar to their use in the younger comparator population and to their use in previously reported elderly surgical groups (7). An exception was that significantly fewer nonagenarians had an abdominal CT scan.

Previous studies tend to emphasise that selected patients in their nineties can be successfully operated on as emergencies and discharged from hospital alive (2-6). In favourable reports, the operative mortality of emergency surgery in nonagenarians is between 20 and 30% (3-6). By contrast, the striking finding here was the rarity of surgical operation amongst the nonagenarians (4% v 38% of comparator group; p=0.001) – despite the higher nonagenarian death rate after admission (16% v 4% of comparator group; p=0.04). Others have also found that a smaller proportion of very elderly with an acute abdomen are suitable for surgical intervention when compared to younger patients (8).

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Catastrophic outcomes after abdominal surgery in the elderly are closely related to advanced comorbidity (6, 9) – NCEPOD (10) described 82% of nonagenarian surgical deaths as being associated with ASA III or worse. Thus significant comorbidity and poor performance status (11) means that surgical intervention for the acute abdomen in many very elderly patients is unlikely to be of benefit. This perception of poor patient outcomes in our experience, led to 98% of nonagenarians admitted with an acute abdomen either dying in hospital without surgical intervention or after a median stay of 4 days, being discharged back to their admission address.

It is strongly our view that neither age alone nor subjective rating systems (12, 13) can determine the appropriateness of surgical intervention in the individual elderly patient. However, the place of palliative treatment must remain a major consideration for nonagenarians with significant comorbidity and/or severe surgical illness (9). Future admission protocols for nonagenarians with a suspected acute abdomen would usefully incorporate assessment of “illness severity” before the decision to admit –the aim being to avoid the upset and distress of admission for the very many elderly patients who are unlikely to benefit from hospital surgical admission. We plan to study prospectively and comprehensively the management and outcome of this growing group of patients in order to help in creating appropriate admission protocols.

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Tables:

Table 1 – Investigation and Management

	Nonagenarians n=49	Comparator Group n=50	p
Gender	14M:35F	25M:25F	0.003
Age Median (range)	92 (90-99)	53.5 (50-59)	<0.0001 (Mann Whitney)
Biochemical Investigations	44 (90%)	47 (94%)	ns
Haematological	45 (92%)	48 (96%)	ns
Chest Radiograph	26 (53%)	25 (50%)	ns
Plain abdominal film	34 (69%)	26 (52%)	ns
Ultrasound scan	9 (18%)	10 (20%)	ns
CT abdomen and pelvis	4 (8%)	12 (24%)	0.03
Surgical Operation	2 (4%)**	19(38%)	0.0001

(** 1 patient died after surgery)

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Table 2 – Outcomes

	Nonagenarians n=49	Comparator Group n=50	p
In-patient Mortality	8(16%)*	2(4%)**	0.04 [Fisher's Exact Probability Test}
Hospital Stay (days) Median (range)	4 (2-72)	3 (0.1-90)	ns
Discharge to preadmission address	39/41 (95%)	46/48 (96%)	ns
Discharge to a new nursing facility	2/41 (5%)	2/48 (4%)	ns

(*Nonagenarians - 1 small bowel infarction, 1 CVA, 1 obstruction, 1 pneumonia, 2 cases of peritonitis, 1 postoperative death: 1 septicaemia

**Comparator group 1 pneumonia & cirrhosis, 1 carcinomatosis)

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Table 3- Pre-admission and post- discharge domicile of the nonagenarian group

Pre-admission domicile	Number of patients	Outcome		
		Death	Discharge destination	
			Pre-admission address	Higher level of care
Nursing home	3	1	2	0
Residential home	15	2	13	0
Sheltered housing	3	1	2	0
Patient's own home	28	4	22	2
Total	49	8	39	2

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Table 4- Final diagnoses of discharged nonagenarians*

Method of diagnosis	Number of patients	Diagnosis
CT**	4	2 diverticular disease, 1 cholangiocarcinoma, 1 small bowel obstruction
USS**	5	3 cholelithiasis, 1 pancreatic Ca, 1 normal
Endoscopy**	2	1 Sigmoid volvulus, 1 colon cancer
Operation**	1	1 Perforated diverticular disease
Laboratory investigations**	3	3 Pancreatitis
Plain imaging**	2	1 Pseudo-obstruction, 1 constipation
Clinical assessment only	10	4 uncomplicated hernia, 4 rectal prolapse, 2 haemorrhoids
Total	27 *	

*14 patients did not have investigations to positively confirm the discharge diagnoses (6 non-specific abdominal pain, 4 diverticular disease, 2 constipation, 1 biliary colic, 1 adhesions)

** In combination with clinical assessment

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