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SHORT REPORT

Performance indicators for hospital services for older people

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Abstract

Background: standardised assessment is recommended in geriatric practice to improve patient care and generate quality data for audit and research. High level indicators used to measure performance of rehabilitation units suggested that more patients were discharged to long-term residential care from one of two hospitals in a Health Authority in South East England.
Objectives: to test whether the information provided by standardised assessment could inform performance indicators used to compare outcomes between hospitals.
Design: prospective observational study.
Subjects: consecutive patients admitted for rehabilitation to two general geriatric rehabilitation wards in each of two nearby district general hospitals.
Methods: patients were assessed using standard tools (Barthel and Abbreviated Mental Test score) and various scales of the inter*RAI* MDS assessment system (mental and physical functioning, pressure ulcers, continence, falls, mood), within a week of admission and up to one week before discharge. Place of residence prior to admission and discharge destination were determined.
Results: on bivariate analysis there was a significant difference in discharge to residential and nursing homes between hospitals. Results from multivariate logistic regression analysis showed an increased risk for institutionalisation at discharge for women [odds ratio 2.42 (95% CI 1.41–4.14)] and patients with impaired cognitive function [odds ratio 1.53 (95% CI 1.28–1.82) for each point increase in MDS cognitive performance scale] and physical function [odds ratio 1.15 (95% CI 1.08–1.22) for each point increase in MDS short ADL scale]. Barthel and Abbreviated Mental Test showed similar odds ratios. Hospital did not remain a significant predictor of discharge destination following adjustment for patients' physical and cognitive function.
Conclusions: comparisons of outcomes between hospitals could be misleading unless informed by standardised data on physical and mental functioning of rehabilitation patients.

Keywords: *standardised assessment, rehabilitation, performance indicators, case-mix*

Introduction

Standardised assessment has been recommended for routine practice in geriatric medicine to ensure: the systematic evaluation of the individual, the identification of relevant problems requiring further investigation and treatment, the facilitation of care planning and the recording of case-mix variables so that comparative audit and research becomes possible [1]. The National Service Framework has specifically identified standardised assessment as a key component of good geriatric practice [2, 3].

Comparisons between units have become an increasingly important part of the government agenda to improve standards and reduce variation in quality of care around the country [4–6]. The success of this method depends on whether good comparative data can be obtained and, in particular, on whether case-mix differences between settings can be measured.

The use of performance indicators to generate league tables to compare service providers is currently at an early stage of development. The Department of Health has recently launched a consultation exercise to develop high quality performance indicators [7]. To enable continuous service improvement and to demonstrate accountability for the spending of resources there is a need for credible, meaningful and accurate performance indicators. It is yet to be determined how comprehensive case-mix adjustment needs to be to enable valid comparison between centres.

The aim of NHS inpatient geriatric rehabilitation is to restore patients to their previous level of functioning prior to the illness necessitating admission and to facilitate discharge to the patient's own home whenever possible. The need to prevent unnecessary admissions to residential and nursing homes is a theme central to government policy [8]. The Department of Health has introduced new monitoring arrangements which will track the number of admissions from hospital to residential and nursing homes [6]. Discharge destination is therefore an important outcome measure of geriatric rehabilitation, hence its use as a performance indicator.

The aim of the study was to determine whether standardised assessment in NHS geriatric rehabilitation wards can usefully inform comparisons of discharge destination between hospitals.

Method

The standardised assessment instruments used in the study were the Barthel Index [9], the Abbreviated Mental Test (AMT) [10] and the minimum dataset/resident assessment instrument (MDS/RAI) designed in the US for use in nursing homes, since adapted for use in the UK [11–17] and internationally validated.

The study population consisted of consecutive, consenting elderly patients admitted for rehabilitation to and discharged from two general geriatric rehabilitation wards in each of two nearby district general hospitals (Hospital A and Hospital B).

Two research assistants with nursing backgrounds conducted assessments at admission and prior to discharge having first obtained consent from the patient. Patients were excluded if they were acutely unwell or terminally ill. Confused and dysphasic patients (i.e. those who the research assistant found were unable to understand the consent procedure or unable to communicate) were not excluded (agreement was obtained from relatives).

Patients were assessed within a week of admission and the following were collected: Barthel Index and MDS short ADL scale [15], AMT and MDS cognitive performance items which are used in the MDS cognitive performance scale (CPS) [16], and the MDS scores for continence (bladder and bowels), pressure sores, number of falls, MDS mood scale [17], formal and informal support and place of residence prior to admission. The same data were collected at or up to one week prior to discharge. The number of patients who died in each ward was recorded.

The outcome measure (dependent variable) was discharge home or to an institution (residential or nursing home). Independent variables included age, gender, ADL using Barthel and MDS short ADL scale, cognitive function using AMT and MDS cognitive performance scale (CPS), MDS scores for continence (bladder and bowels), pressure sores, number of falls and the MDS mood scale. The MDS short ADL scale gives a range of scores between 0 and 16, 0 indicating independence and 16 indicating total dependence. The CPS gives a range of scores between 0 and 6, 0 indicating intact cognitive function and 6 very severe impairment.

As the primary outcome measure was discharge destination patients were excluded from the analysis if they died before discharge. If patients were transferred to other hospitals to complete rehabilitation or for emergency or specialist treatment their final discharge destination was obtained and included in the analysis but secondary outcome measures such as mental and physical functioning, falls and incontinence could not be obtained.

Simple comparisons between wards and hospitals were made using chi square and *t*-test. Variables found to be significant on bivariate analysis and significant at $P < 0.1$ were entered into a multivariate logistic regression model. Statistical analysis was performed using SPSS. Ethics committee approval was granted by the Local Research Ethics Committee.

Results

Five hundred and sixteen patients were admitted and included in the study between December 1997 and February 1999 (Table 1). A total of 27 patients were excluded from the analyses as a result of missing data items. Forty-eight patients were transferred to other units or hospitals, 41 from Hospital A and 7 from Hospital B (these patients will henceforth be referred

Table 1. Study population

	Hosp A			Hosp B			
	Male ($n=111$)	Female ($n=137$)	Total ($n=248$)	Male ($n=82$)	Female ($n=186$)	Total ($n=268$)	Total ($n=516$)
Mean age (SD)	82.7(6.9)	85.4(6.5)	84.1(6.9)	85.4(6.4)	85.9(5.9)	85.7(6.0)	84.9(6.5)
Died (%)	15(13.5)	26(19.0)	41(16.5)	13(15.9)	18(9.7)	31(11.6)	72(14.0)

Table 2. Discharge destination of patients discharged alive

	Discharge destination			
	Home	RH or NH	Other	Total
All patients*				
Hospital A	144 (70.2)	55 (26.8)	6 (2.9)	205 (100)
Hospital B	130 (61.3)	80 (37.7)	2 (0.9)	212 (100)
Excluding transfers*				
Hospital A	128 (71.9)	50 (28.1)	0 (0)	178 (100)
Hospital B	128 (61.75)	78 (37.5)	0 (0)	206 (100)
Patients admitted from home excluding transfers				
Hospital A	125 (79.1)	30 (18.9)	0 (0)	155 (100)
Hospital B	127 (73.8)	45 (26.2)	0 (0)	172 (100)

*chi square $P<0.05$

to as 'transfers'). More transfers took place from Hospital A as this hospital has three community hospitals in its catchment area to which patients could be transferred for example to be nearer relatives.

There was no significant difference between wards or hospitals in age, gender or number of deaths. In Hospital A non-significantly more patients were admitted from home rather than from residential or nursing homes ($P=0.17$). Using intention to treat analysis (by including patients transferred out of the rehabilitation wards) significantly more patients were discharged to residential or nursing homes from Hospital B than from Hospital A (Table 2). When only patients admitted from home were considered, although more patients were discharged to residential and nursing homes from Hospital B, the difference was not significant (Table 2).

Only three factors were significantly related to increased risk of discharge to a residential or nursing home in the regression model – gender (female, OR 2.42, 95% CI 1.41–4.14), cognitive function (for each 1 point increase in MDS cognitive performance scale, OR 1.53, 95% CI 1.28–1.82) and physical function (for each 1 point increase in MDS short ADL scale, OR 1.15, 95% CI 1.08–1.22) (Table 3). Using the Barthel and AMT provided similar results (Table 4). The same factors on admission had similar predictive power.

When Hospital was entered into the logistic regression model it was not a significant predictor of discharge destination, [Hospital A *versus* Hospital B, OR 1.29 (95% CI 0.75–2.22)]. Age was not a significant predictor of discharge destination.

Table 3. Logistic regression for risk of discharge to a nursing home/residential home for MDS Cognitive Performance Scale and MDS short ADL Scale

	Chi square	df	*P*-value	Odds ratio	95% confidence interval
Hospital	0.74	1	0.390	0.80	0.47–1.34
Gender (female)	10.36	1	0.001	2.42	1.41–4.14
MDS Cognitive Performance Scale (for each point increase)					
	22.77	1	0.000	1.53	1.28–1.82
MDS short ADL Scale (for each point increase)					
	22.49	1	0.000	1.15	1.08–1.22

Table 4. Logistic regression for risk of discharge to a nursing home/residential home for Barthel and AMT

	Chi square	df	*P*-value	Odds ratio	95% confidence interval
Hospital	0.87	1	0.352	0.77	0.45–1.33
Gender (female)	7.68	1	0.006	2.28	1.27–4.09
AMT (for each point decrease)	8.23	1	0.004	1.16	1.05–1.29
Barthel (for each point decrease)	41.07	1	0.000	1.25	1.17–1.34

Discussion

The Health Authority had become aware of a difference in rates of admission to residential and nursing homes between the two hospitals and wanted to explore this. Although initial analysis indicated that more patients were institutionalised from Hospital B than from Hospital A, when data on physical and mental functioning as well as gender were included in a logistic regression analysis there was no significant difference. This underlines the importance of including data on physical and mental functioning (as a minimum) when calculating performance indicators for services for older people.

Reliable data on physical and mental functioning could be best obtained if standardised assessment measures were used universally to allow valid cross comparisons between centres. A routine, brief pre-discharge assessment would generate suitable data to be included in hospital episode statistics. The Royal College of Physicians of London and British Geriatrics Society have advocated the use of the Barthel and AMT in routine standardised assessment of the elderly [1]. These are well known and widely used but are not completed on discharge, even where there is a stated commitment to do so [18, 19]. The inter*RAI* MDS assessment scales used in this study (CPS and MDS short ADL scale) require a total of 7 items only and take considerably less time and effort than the Barthel and AMT (20 items). Whereas the AMT requires the patient to reply to a series of questions, the CPS consists of information already gained at assessment, for example, the ability to make oneself understood, short-term memory and decision-making skills. On the other hand the information required by the CPS is usually arrived at by assessment over a period of time whereas the AMT can be done 'stat'. An advantage of the CPS is that it is free of the cultural issues that affect use of the AMT. A possible disadvantage of the CPS is the need for completion of an algorithm to obtain the score. This study indicates that the MDS short ADL scale and CPS can be used to adjust for case-mix equally as well as the Barthel and AMT.

They may be more acceptable and universally completed as they are short and require less time to complete than the Barthel and AMT.

In summary, this study found that two small, standardised assessment scales in geriatric rehabilitation wards provided data on physical and mental functioning which allowed the case-mix adjustment of rates of institutionalisation, a performance indicator used to compare hospitals.

Key points

- Performance indicators are increasingly being used to compare units with the aim of driving up quality standards.
- Standard assessment is a recommended component of geriatric practice which aims to improve quality of patient care and which can also generate data on case-mix for audit and research.
- The MDS short ADL scale and the CPS are briefer, valid alternatives to the Barthel and AMT as routine geriatric assessment instruments.
- This study illustrates the importance of adjusting for case-mix when comparing hospital outcomes.

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