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Predictors of change in 'discharge destination' following treatment for fracture neck of femur

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ABSTRACT

Objectives: The purpose of our study was to analyse the incidence and factors predicting the 'change in discharge destination' in patients with fractured neck of femur who were treated surgically.

Materials and methods: Fifteen hundred and seventy-three consecutive patients admitted with a fractured neck of femur, residing in their own home prior to admission were studied. Patients who did not have an operation ($n = 70$) for their hip fracture were excluded from the study.

Residential location in the UK is broadly categorised as:

(1) living in their own home;
(2) residential home;
(3) nursing home;
(4) hospitalised.

Results: A downward drift in "discharge destination" of 20% was noted after analysis. Univariate analysis revealed that age, gender, AMT score, place of fall, type of fracture, walking ability outdoor and indoor, ASA grade, medical co-morbidity requiring physician review and delay beyond 36 h to surgery had a significant effect.

Multiple logistic regression analysis revealed that increasing age, male gender (OR = 1.67), accompaniment for outdoor mobilisation (OR = 1.96), increasing ASA grade, AMT score <6 (OR = 4.86), pre-operative medical condition requiring physician review (OR = 2.27), delay greater than 36 h for medical reasons (OR = 4.38) were predictors of the change in discharge destination.

Conclusion: The most important predictors of the change in the discharge destination were the medical condition, cognitive and physical function of the patient at admission. Male gender and increasing age were contributory. The only clinician dependent factor that seemed to affect this change of residential status was delay to surgery secondary to medical problems. Awareness of key predictors that affect the "discharge destination" can be useful for the multidisciplinary team and patients' families to evaluate and plan for an early, satisfactory and appropriate referral to either community services or institutional care, which in turn could have a significant socioeconomic impact.

Introduction

Fracture of the neck of femur is a significant injury in the elderly population. A common reason for admission to an orthopaedic trauma ward, it is a life changing event for the patient and has a major impact on health economics [1]. Demographic projections predict an estimated increase in the incidence and annual expenditure that could reach £2.2 billion by 2020 in the United Kingdom [1]. It is hence not surprising that care provided to the patients with fracture neck of femur is a topic of national debate and scrutiny.

Following a fracture neck of femur, many patients are unable to regain their pre-fracture status of mobility and daily activities [2]. As a result some are not able to return to their pre injury residential status in-spite of surgery and adequate rehabilitation. Hence, they may require institutional care for the rest of their life. Less than 60% of these patients return to their own place of residence [3] and even fewer reach their pre-injury ambulatory status [4]. Inability to

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return to their own home following rehabilitation inevitably has an emotional and psychological impact on these vulnerable patients and their relatives [5], which should not be underestimated. It has been shown that the high prevalence of anxiety or depression in patients following fracture neck of femur can be improved with social contact [6].

Planned treatment should be tailored not only to rehabilitate these patients to their pre-injury mobility status but also ideally targeted to return them to their own home environment. About 10–20% of the patients admitted from their home ultimately move to institutional care [1]. This downward 'drift' in 'discharge destination' has a substantial social and economic impact [7].

Vast amount of literature already exists regarding the morbidity, mortality, complications & multidisciplinary care for neck of femur fractures [8–10,11–15] but very few studies have described alteration of residential status secondary to a fracture neck of femur using discharge destination as a measure of outcome [3,16,17].

The objective of our study was to analyse the incidence and the factors predicting this 'change in discharge destination'. The factors studied and analysed were: age, gender, type of fracture and operation, pre-injury mobility status (walking ability indoor and outdoor), type of anaesthesia, ASA grade, AMT score, place of fall, type of operation, delay in surgery, other associated injuries if any, presence of pressure ulcers and the need for pre-operative acute medical review.

Materials and methods

Between January 2008 and March 2012, 1573 consecutive patients admitted to our institution with a fractured neck of femur, who lived in their own home prior to admission, were identified for inclusion in this study. Of this cohort, patients who did not undergo surgery ($n = 70$) were excluded from the study. One hundred and thirty three patients died before their final discharge, either in the hospital or during their rehabilitation in the community hospital and were excluded from the final analysis.

Data included patient demographics, mobility status and independence before admission including indoor and outdoor walking ability, type of the fracture, ASA grade, place of fall, type of surgery, presence of pressure ulcer, Abbreviated Mental Test—AMT score (assessment of cognitive function using a validated questionnaire [18]), other associated injuries and delay (if any) to surgery (whether for medical, patient related or logistical reasons (e.g. unavailability of operating theatre/senior surgeon availability). The delay was classed beyond 36 h. Patients were categorised according to their level of social function as described by Klezl et al. [19] following kyphoplasty for osteoporotic vertebral compression fractures.

Residential location following discharge after the treatment for fracture neck of femur has been broadly categorised as following:

(1) living in their own home;
(2) residential home;
(3) nursing home;
(4) hospitalised.

This categorisation is unique to the population in the United Kingdom due to the aspects of social care framework. All patients included in the study were treated surgically and rehabilitated by a multidisciplinary team that facilitated the appropriate discharge destination.

Statistical analysis

Statistical analysis was performed using R software [20]. Odds ratio (OR) was estimated using the univariate and multiple logistic regression. Odds ratio estimates the relative probability of alternative discharge destination or patient reaching his or her own home (original place of residence) when the risk factor is present.

Table 1
Univariate logistic regression analysis.

Variable	Statistic value	Degrees of freedom	*p* Value
Age	82.89	6.00	<0.001
Gender	4.55	1.00	<0.001
Place of fall	2.56	1.00	0.109
NOF description	9.02	3.00	0.032
Pathological fracture	0.73	2.00	0.627
Other injuries if any	1.22	1.00	0.269
Walking ability indoors	46.67	4.00	<0.001
Accompanied indoors	14.72	2.00	<0.001
Accompanied outdoors	57.34	3.00	<0.001
AMTS score	84.00	2.00	<0.001
Pressure ulcer	5.47	2.00	0.208
ASA Grade	63.82	4.00	0.003
Medical condition requiring physician review prior to operation	24.15	1.00	<0.001
Type of operation	20.66	4.00	0.002
General anaesthesia	1.67	1.00	0.195
Spinal anaesthesia	0.04	1.00	0.833
Delay up to 36 h	13.38	3.00	0.001
Delay up to 48 h	10.79	3.00	0.002

Results

One thousand and sixty eight patients were females and 435 were male. One hundred and thirty-three patients who died either in the hospital or during their rehabilitation in the community hospital before the final discharge were excluded from the final analysis.

Univariate logistic analysis of the variables (Table 1) revealed that age, gender, AMT score, walking ability outdoor and indoor, whether patient needed accompanying for indoor and/or outdoor mobility, ASA grade, need for acute pre-op medical review and delay to surgery seemed to have a significant effect.

Table 2
Multiple logistic regression analysis.

	'*p*' Value	95% CI (confidence interval)	Odds ratio for change in discharge destination
Age			
50–59	0.792	0.17–10.52	0.76
60–69	0.410	0.11–2.50	1.92
70–79	0.388	0.11–2.37	1.96
80–89	0.004	0.05–1.00	4.54
90–99	0.004	0.02–0.49	9.09
>100	0.012	0.00–0.52	20
Male gender	<0.001	0.44–0.81	1.67
Admitted by A&E	0.052	0.99–4.66	0.46
Accompanied outdoors	0.001	0.34–0.77	1.96
AMTS score < 6	<0.001	3.19–7.41	4.76
ASA Grade 1	0.329	0.52–6.98	0.52
ASA Grade 2	0.050	1.00–2.78	0.59
ASA Grade 3	0.615	0.70–1.84	0.88
ASA Grade 4	0.002	0.37–1.18	1.51
Medical condition requiring physician review prior to operation	0.002	0.26–0.75	2.27
Type of anaesthesia—general	0.047	0.25–0.99	2
Delay in surgery >36 h for logistical reasons	0.984	0.68–1.45	1
Delay in surgery >36 h for medical reasons	<0.001	1.21–15.79	4.35