

Depression, Dementia and Delirium in Older Adults Presenting with Hip Fractures to Orthopaedic Services at a General Hospital

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Abstract

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Aim: A survey to address psychiatric morbidity in older adults admitted with hip fracture, involvement of liaison psychiatric services for older adults and evaluate change of level of care.

Methods: Information about mental and physical health prior to and during admission, referrals to Geriatrician or Liaison Old Age Psychiatry (LOAP) team, duration of hospital stay and level of care was collected for 43 consecutive admissions of older adults for hip fracture over 6 months period.

Results: Depression, dementia and delirium were present in 28%, 42% and 23% patients respectively. A pre admission diagnosis of depression was associated with lower Barthel scores on admission, whereas dementia and delirium with lower Barthel scores on both admission and at 48 hours post surgery. Pre admission diagnosis of depression or dementia and the occurrence of delirium did not affect the duration of stay in the orthopaedic ward or alter the level of care after discharge.

Conclusions: There are high rates of psychiatric morbidity in older adults presenting with hip fracture to orthopaedic services. Active involvement of the LOAP team would facilitate their prompt identification and treatment post fracture and improve outcomes for these patients.

Introduction

High rates of psychiatric morbidity have been reported amongst subjects with hip fracture as compared to community rates [1-4]. Low activity of daily living (ADL) scores and mental state affect the ability of patients with fractures to return back to community [3, 5, 6]. Depression is also associated with a slower recovery post hip fracture [7] and higher mortality rates [8]. Similarly, dementia and delirium have an impact on a worse functional outcome following fracture [9].

In a clinical setting, these three psychiatric conditions can easily go under-diagnosed since there is no continuous input from psychiatric services, and many of these individuals may have no previous formal psychiatric diagnosis. The development of Liaison Old Age Psychiatry services (LOAP) provides an opportunity for these teams to provide psychiatry input to orthopaedic acute trauma, orthopaedic rehabilitation and medical rehabilitation wards for the elderly, and facilitate detection of psychiatric conditions that may hamper rehabilitation

following hip fracture in older adults.

The aim of this audit was to address the psychiatric morbidity of older subjects presenting with hip fracture, the involvement of the LOAP team (consultation requests from the orthopaedic team or the geriatrician who visits the wards weekly) and outcomes in terms of duration of hospital stay and level of care on discharge.

Methods

Survey forms were completed for all 43 consecutive admissions of older adults (>65 years) for hip fractures only to two orthopaedic acute trauma wards over a six-month period (1 June 2004–30 November 2004; Table 1). Forms were completed using medical and nursing notes, and interviews with patients and next of kin by an orthopaedic nurse practitioner (TM), a care of the elderly nurse (CS) and an orthopaedic nurse specialist (JJ). The information gathered includes: demographic, mental and physical health prior to admission, 4-item Geriatric Depression Scale (GDS4) [10], Abbreviated Mental Test (AMT) scores [11], Barthel index [12] scores on admission and 48 hours post surgery, presence of dementia and/or depression as recorded in clinical notes, onset of delirium, referral to Geriatrician, referral to LOAP team and duration of hospital stay. The diagnosis of depression, dementia and delirium were established according the DSM-IV criteria (1994) [13], and the diagnosis of delirium was further supported by the Confusion Assessment Method assessment [14].

Table 1: Characteristics of patients admitted with hip fracture.

Variable	Value (%)
Male	7 (16%)
Female	36 (84%)
Age (yrs)	81 (67–96yrs)
Dementia	18 (42%)
Depression	12 (28%)
Delirium	10 (23%)
Physical illness:	42 (98%)
Falls	21 (49%)
Hypertension	23 (54%)
Frailty*	12 (28%)
Gait disturbances**	16 (37%)
Accommodation:	
Level 1	31 (72%)
Level 2	10 (23%)
Level 3	2 (5%)

All patients with depression were treated with antidepressant medication, and did not have active symptoms of depression during their hospital stay. Most frequent physical problems noted. * Frailty was defined by presence of weight loss, general weakness, loss of physical activity and impaired mobility. ** Gait disturbances were attributed to presence of: degenerative joint disease, orthostatic hypotension, dizziness, visual impairment, Parkinsonism and fear of falling.

Accommodation pre and post hospital discharge was recorded and assigned a numerical value to reflect level of care as follows:

Level 1: Home, home with increased help, sheltered accommodation;

Level 2: Residential, Elderly Mentally Ill (EMI) Residential, Nursing and EMI Nursing Homes;

Level 3: Continuing National Health System (NHS) care (including hospital care or the home of the person), Elderly Severely Mentally Ill (ESMI), other (e.g. hospices and hospital funded continuing care beds within nursing homes).

Approval to conduct this study was obtained from the Trust Caldicote Guardian (2004).

Statistical analysis

Statistical analysis was performed using PASW Statistics 19, Release Version (SPSS, Inc., 2011, Chicago, IL). The analysis included: mean comparisons (Barthel scores and duration of stay with psychiatric diagnosis) using the independent t-test, association of psychiatric diagnosis with change to level of care (Chi square), and association of psychiatric diagnosis with the development of delirium (Fishers exact test). Correlation between duration of stay and Barthel scores was done using Pearson's correlation coefficient.

Results

Out of the 43 subjects, two died following surgery. Physical problems were identified in 42 patients pre- and during admission, with 41 patients reviewed by a geriatrician (Table 1). Previous history of depression was recorded in 12 and 18 patients, respectively. 4-Item GDS (GDS4) was completed when a patient was thought to be depressed by ward staff, and this was done for three of 43 patients (GDS4 scores were $\leq 1/4$, suggesting no presence of depression; [10]). No new cases of depression or dementia were identified during the admission. AMT score was recorded for two patients on admission and 17 patients post surgery.

Barthel score was recorded for 36 patients pre admission, and 32 patients were scored 48 hours post surgery (table 2). There was a significant correlation between duration of hospital stay and Barthel scores post surgery ($r=-0.33$, $p=0.03$) but not pre admission Barthel scores ($r=-0.61$, $p=0.36$). Only one patient was

referred to the LOAP team. This was an 86 year old lady for assessment of behavioural problems and confusion/delirium post surgery. After 85 days on the orthopaedic ward she was transferred to an acute medical ward following a cerebrovascular accident.

Depression: Pre admission diagnosis of depression was significantly associated with lower Barthel score (worse physical function) on admission ($t=2.29$, $p=0.03$). There was no significant association between pre admission diagnosis of depression and Barthel score at 48 hours post operatively ($t=1.6$, $p=0.12$) or change in Barthel score ($t=1.17$, $p=0.25$). Pre admission diagnosis of depression was not significantly associated with duration of hospital stay ($t=0.38$, $p=0.71$), an increase in level of care on discharge (Chi sq= 0.56, $p=0.91$), or onset of delirium (Chi sq=1.16, $p=0.56$) (Table 2).

Table 2: Impact of psychiatric morbidity on activities of daily living (Barthel index score), duration of stay and level of care on discharge in subjects with hip fracture.

Psychiatric morbidity		Barthel score on admission (mean)		Barthel score post surgery (mean)		Mean duration of stay (days)	% Discharged to increase level of care
Depression	Yes	14		6		26	27%
	No	17	$p=0.03$	8	$p=0.012$		
Dementia	Yes	13		4		26	29%
	No	18	$p=0.001$	9	$p=0.001$		
Delirium	Yes	14	$p=0.04$	4	$p=0.01$	30	20%
	No	17		8			

The overall mean duration of inpatient stay for the whole group was 23 days, and 28% of the subjects involved in the current survey had increase in their level of care on discharge. Independent t-test analysis.

Dementia: A pre admission diagnosis of dementia was significantly associated with lower Barthel score pre admission ($t=4.40$, $p=0.001$), 48 hours post operatively ($t=5.99$, $p=0.001$) and onset of delirium during hospital stay (Chi sq=4.24, $p=0.04$), but not with duration of hospital stay ($t=0.61$, $p=0.55$) or an increase in level of care on discharge (Chi sq=0.46, $p=0.93$) (Table 2).

Delirium: 23% of patients developed delirium during their hospital stay as judged by the orthopaedic and/or medical teams. A diagnosis of delirium was significantly associated with lower Barthel score pre admission ($t=2.16$, $p=0.04$) and at 48 hours post operatively ($t=2.9$, $p=0.01$). Presence of delirium did not influence duration of hospital stay ($t=1.3$, $p=0.19$) or an increase in level of care on discharge (Chi sq=0.63, $p=0.89$) (Table 2).

Discussion

Our survey confirms high prevalence of depression and dementia in older adults with hip fracture. Similar findings have been reported for elderly who suffer with depression [15] and dementia [1, 9, 16], take antidepressant medication [17, 18], or medication for behavioural changes in dementia (e.g. benzodiazepines and antipsychotics) [19, 20]. We also report higher rates of depression among hip fracture patients than would be expected in the community, similar to previous studies [21, 22]. Furthermore, a pre admission diagnosis of depression was significantly associated with worse physical function prior to admission.

In contrast to previous studies, which reported significant association between presence of depression and Barthel score before and after rehabilitation [21], and a slower recovery post hip fracture [7], we failed to detect an association between a pre admission diagnosis of depression and activities of daily living 48 hours post surgery, duration of hospital stay or change in level of care after discharge. One reason for this may be the number of the relevant missing data. The effect of active symptoms of depression during hospital stay however cannot be ascertained from this survey. This will require prospective studies to include active screening for depression to address the impact of depressive symptomatology upon performance on daily activities and rehabilitation in older adults with hip fractures.

Impaired mobility and falls are common features of dementia, and not surprisingly, 42% of patients in this survey had a diagnosis of dementia, a higher prevalence than in community (4-32% for 70->90 years old, respectively; [22]), and this was also accompanied by high prevalence rates of falls and gait disturbances in our sample. Dementia is associated with a worse functional outcome following fracture [9] and increased mortality [1, 23, 24]. However, our dementia patients were not more likely to have a prolonged stay or to be discharged to a higher level of care than non-dementia patients.

During our survey 23% of patients developed delirium, similar to rates of delirium post surgery in hip fracture patients (28 - 50%; [25]), had greater physical disabilities [26], and were more likely to have dementia, similar to previous studies [26, 27]. However, our findings somewhat differ from a previous report of close association between delirium post hip fracture and longer hospital stays, reduced independence post discharge and increased mortality [28]. This may be due either to

the small number of delirium subjects in the current survey, or to the regular medical reviews of our older orthopaedic patients,.

Our study has a number of limitations. Being a survey, it's main aim was to address the prevalence rates of mental health problems in older adults with hip fracture and to inform about the need of specialist Liaison Old Age Psychiatry services involvement on orthopaedic wards. Our findings also reflect the incompleteness of clinical information contained in medical notes, especially in relation to mental health functioning of this group. In addition, the number of enrolled older participants was relatively small, and is due to the mixed character of orthopaedic acute trauma wards that accommodate the whole spectrum of adults with various orthopaedic problems.

Conclusions

The results of this survey confirm high rates of both physical and psychiatric illnesses in older adults admitted with hip fracture, and that depression and dementia are linked to falls and hip fracture. Outcomes in terms of duration of stay and level of independence on discharge have not been affected by the presence of dementia or delirium, suggesting that these coexisting problems are managed well by the orthopaedic and medical teams in a general hospital setting.

The outcomes for depression are less clear. Depression rating scales are not routinely completed. Our survey sample was small; however it is likely that patients with clinically active depression during their admission were missed. This could be confirmed by following another cohort of patients post fracture and completing routinely depression assessments, including brief depression rating scales, on all patients soon after admission.

It is also noteworthy that despite the presence of a LOAP team in the hospital only one patient was referred. This compares to 41 of the 43 patients being reviewed by a geriatric medical team for physical problems. The outcome of this is reflected in the favourable delirium assessment measures. However, this is not the case for depression in this population. We propose that identification of cases of depression and appropriate use of screening tests could be facilitated by active involvement of the LOAP team, e.g. by attendance at ward rounds, education and support of ward staff around identifying depression and ongoing response to

consultation requests [29]. Active treatment of patients with a previous diagnosis of depression, as well as identifying new cases with depression in the older adults with hip fracture may well result in improving their quality of life, rehabilitation outcome and minimise future falls and incidents.

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