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Preventing falls in In-Patient Older Adult Mental Health Services: Different Causative Factors in Mental and Neurocognitive Disorders

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Abstract

Aims: To compare falls sustained in two groups of patients (one with mental disorders and the other neurocognitive disorders), in two acute inpatient older adult mental health services in Western Australia (WA).

Background: Falls are the most common adverse event experienced during inpatient care. Older people with mental disorders and neurocognitive disorders constitute a high-risk group for accidental falls in hospitals.

Methods: Data relating to 207 fall events from 2010-2011 reported in medical records and incident reports were collected. Individuals who sustained a fall were grouped as having a mental disorder (n=73) or neurocognitive disorder (n=134) according to their primary ICD10 diagnosis.

Results: Significant differences in the factors that contributed to the fall between the two groups were highlighted. Falls sustained by those with a neurocognitive disorder were due to confusion and disorientation, and psychotropic medication effects. Their falls were more likely to be unwitnessed and injuries were generally less severe. Falls sustained by older adults with mental disorders were attributed to symptoms of their illness or medication side effects and tended to result in more severe injuries requiring medical treatment or further investigation.

Conclusions: Older adults with neurocognitive disorders and behavioural and psychological symptoms associated to dementia have different falls risk factors related to their specific illness and cognitive functioning. There is a need for health professionals to receive training to assess, manage and provide appropriate interventions to reduce the specific falls risks in patients with both mental disorders and neurocognitive disorders.

Keywords: Falls; Functional disorder; Organic disorder; Older adult mental health services; Mental health nursing

Introduction

It is anticipated that by the year 2030, 20% of the Australian population will be aged over 65 years [1]. As the population of Australia ages the number of older adults living with a mental disorder will also increase [2]. Older people with an enduring and/or episodic severe mental disorder during adulthood will 'graduate' from requiring services designed to meet the needs of adults of working age (adult mental health services) to requiring services designed for older people, 65 years and older (older adult mental health services or residential care) [3]. Providing acute mental health services to older adults in Australia will become more complex as older people with mental disorders are more likely to have multiple physical health conditions and cognitive impairments [4].

Acute inpatient older adult mental health services (OAMHS) in Australia are generally small services attached to inpatient facilities that also provide mental health care to adults aged between 18-65 years [5]. These services provide specialist care for older adults with severe psychosis or depression, chronic schizophrenia or patients with neurocognitive disorders such as delirium or dementia who are agitated/psychotic [6,7]. This patient diagnostic mix reflects what has been reported internationally [5]. It is estimated that up to 90% of all patients with dementia will develop at least one episode of Behavioural and Psychological Symptoms of Dementia (BPSD) that require specialist care [8]. This Australia this specialist care is often provided by acute inpatient mental health services. Acute OAMHS therefore are tasked with the need to provide specialist interventions aimed at relapse prevention and recovery to treat mental disorders as well as providing assessment, supervision and assistance with activities of daily living and supportive care for patients with neurocognitive disorders and BPSD. Added to this is the everyday challenge to reduce the potential for hospital acquired harms associated with delivering acute inpatient services to older adults; for example infections, decubitus ulcers, unwanted medication effects and injuries associated with falls [9].

A fall is any unexplained event that results in the patient's inadvertently coming to rest on the floor, ground, or lower level [10]. Falls impose a substantial burden on health services in Australia and contribute significant costs to an already over stretched health budget [9]. Factors associated with falls include but are not limited to cognitive impairment, gait disturbance and medications side effects. The ability to stand from a sitting position, previous falls, needing assistance with ambulation and hyperactive symptoms were the factors

most strongly associated with falls in older adults in community settings [11]. Although the majority of falls in older adults occur in the community, falls are the most common adverse event experienced during inpatient care and cognitively impaired older people constitute a high-risk group for accidental falls in hospitals [12]. In 2010-11, 1.3 million patient days (or one in every 10 days spent in hospital) by a person aged 65 and older was directly attributable to an injurious fall. Fall rates for inpatient psychiatric services can be three to four times higher than rates in general hospitals [13].

There are only a small number of studies that investigate falls in hospitalised older adults with mental disorders. These studies have highlighted that falls are more likely to occur in females, those who are treated with electroconvulsive therapy (ECT), mood stabilizers [14], benzodiazepine or antihypertensive medications or patients who have more comorbid acute medical conditions [15] such as cardiac arrhythmias, Parkinson's syndrome or dementias [14]. Added to these are the complex issues relating to the mental disorder itself; altered perceptual perception, the fluctuating nature of psychosis or alterations in activity due to changes in mood state [7].

Aims

The aim of the study was to compare falls sustained in two groups of patients (one with mental disorders and the other neurocognitive disorders [16]) in two acute inpatient older adult mental health services in Western Australia (WA).

Design

This study uses a between-group design.

Data Collection

Data relating to fall events reported in medical records and through the Australian Incident Management System (AIMS) (N=207) were collected from two OAMHS in Perth in 2010 and 2011.

Statistical analyses

All data was entered into a IBM SPSS Statistics 22 package (IBM Software Group, 2013; Chicago, USA) [17]. Descriptive statistics and Mann-Whitney U analysis were used to compare gender, age, ICD10 diagnoses, length of stay and co-morbidities (additional ICD10 codes). Chi square analyses were used to determine between group differences in factors that related to fall events and medications taken in the 24 hours prior to a fall.

Participants

Individuals who sustained a fall were grouped into having either a neurocognitive disorder (n=134, 64.7%) or a mental disorder (n=73, 35.3%) according to the primary ICD10 diagnosis as recorded in their medical record [16,18]. Neurocognitive disorders included ICD10 codes F00-09, G20-29 (diseases of the CNS) and G30-39 (degenerative disorder of CNS). Mental disorders included F10-19 (substance use disorders), F20-29 (schizophrenia and delusional disorders) and F30-39 (affective disorders). There were six instances of injury and poisoning (ICD-10 codes of S00-T98) where a review of the medical record revealed that the injury or poisoning was self-inflicted in the context of mood disorder so these were classified as mental disorders (Table 1).

ICD10 code			**n**	**%**
Neurocognitive Disorders				
F00-09	**Organic disorders**		63	30.4
	F0.3	3		
	F01.1	8		
	F01.8	3		
	F01.9	31		
	F02.1	1		
	F03	5		
	F05.9	8		
	F09.	1		
	F09.1	3		
G30-39	**Degenerative disorder of CNS**		62	30
	G30.0	10		
	G30.1	4		
	G30.9	45		
	G31.0	3		
G20-29	**Diseases of the CNS**		9	4.3

	G20.			
		Total	134	64.7
Mental Disorders				
F10-19	**Substance use disorders**		7	3.4
	F10.7	1		
	F11.0	6		
F20-29	**Schizophrenia and delusional disorders**		12	5.8
	F20.0	3		
	F20.1	1		
	F20.2	3		
	F20.3	2		
	F25.0	1		
	F25.2	1		
	F28	1		
F30-39	**Affective disorders**		48	23.2
	F30.20	1		
	F31.1	4		
	F31.2	4		
	F31.3	2		
	F31.5	2		
	F31.9	6		
	F32.20	15		
	F32.30	3		
	F32.9	1		
	F33.2	9		
	F33.3	1		
S00-T98	**Injury and poisoning**		6	2.9
	S52.59	2		
	T42.4	1		
	T46.0	3		
		Total	73	35.3

Table 1: Primary ICD10 diagnosis

Ethical considerations

Permission to undertake the study was granted by the two OAMHS involved in the study and ethical clearance to conduct the study was obtained by the South Metropolitan Health Service Human Research Ethics Committees (clearance number 12/6). Data collection involved medical record review and obtaining fall event data from an incident management data base so the need to gain participant consent was waived. All data was de-identified.

Results

Demographics

In patients who fell, there were significant gender differences between the two groups with females with a mental disorder (n=49, 53.8%) outnumbering males (n=42, 46.2%) and males (n=85, 73.3%) outnumbering females (n=31, 26.7%) neurocognitive disorders; X2=8.433 (df, 1)=p 0.004. Fallers in the neurocognitive disorder group tended to be older (M=77.3 years, SD=9.3 and range 52-96 years) than those in the mental disorders group (M=76.1 years, SD=8.5 and range 60-91 years; X2=92.405 (df, 37)=p<0.001), tended to stay in hospital longer (M=97.3 days, SD=91.3 and range 1-485 days compared to M=51.5 days, SD=39.4 and range 1-230 days) Z=-3.615, p<0.001 (Mann-Whitney U) and have more comorbidities (M=9.9, SD=4.9, range 1-19, compared with M=7.7, SD=3.5, range 0-18) Z=2.963, p=0.003 (Mann-Whitney U). There were no between group differences regarding mental health act status (p>0.05) (Table 2).

			Neurocognitive Disorders (n=134)		Mental Disorders (n=73)				
N	**%**		**n**	**%**	**n**	**%**	**X2**	**df**	**p**
		Gender							
116	56.0	Male	85	64.9	31	42.5			
91	44.0	Female	49	37.4	42	57.5	8.433	1	0.004*
		Age							
8	3.9	50-59 years	8	6.1	0	0.0			
35	16.9	60-69 years	17	13.0	18	24.7			
71	34.5	70-79 years	49	37.4	22	30.1			
84	40.6	80-89 years	53	40.5	31	42.5			
9	4.4	90-99 years	7	5.3	2	2.8	9.703	4	0.046*
		Mental Health Act status							
176	85.0	Voluntary	116	88.5	60	82.2			
31	15.0	Involuntary	18	13.7	13	17.8	0.701	1	0.399
		Length of stay							
8	3.8	<2 weeks	3	2.3	5	6.8			
19	9.2	2 weeks	13	9.9	6	8.2			
28	13.5	3 weeks	12	9.2	16	21.9			
95	45.9	1-3 months	55	42.0	40	54.8			
31	15.0	3-6 months	29	22.1	2	2.7			
26	12.6	>6 months	22	16.8	4	5.5	26.305	5	<0.001*
		Co-morbidities							
35	16.8	0 to 4	19	14.5	16	21.9			
84	40.6	5 to 9	46	35.1	38	52.1			
61	29.5	10 to 14	44	33.6	17	23.3			
27	13.0	15 to 19	25	19.1	2	2.7	15.974	3	0.001*
207	100								
*p<0.05									

Table 2: Demographics

Factors relating to the fall

There was a significant difference in the type of fall, activity prior to a fall and the level of severity (determined by AIMS level) between the two groups. Fallers with a neurocognitive disorder were likely to sustain a fall from a standing position (n=57, 42.53%). Falls from syncope were only experienced by those with a mental disorder (n=4, 5.5%). Fallers with neurocognitive disorder fell more frequently while wandering, their falls were more likely to be unwitnessed and injuries were generally less severe. There were no between group differences in environmental influences such as trip/slip hazards, lighting, flooring or the use of equipment (p>0.05).

		Neurocognitive Disorders (n=134)	Mental Disorders (n=73)	X2	df	p
Type of fall	Unobserved	33	13			
	Chair to floor	18	7			
	Bed to floor	19	13			
	Slip/trip	7	8			
	From standing	57	28			
	Syncope	0	4	11.65	5	0.039*
Location of fall	Unobserved	7	3			
	Bed area	52	36			
	Lounge/Dining room	31	9			
	Courtyard	10	5			
	Bathroom	9	8			
	Corridor	25	12	5.39	5	0.37
Activity at the time of the fall	Unobserved	54	23			
	Showering/toileting	5	9			
	Transferring	5	11			
	Wandering	34	12			
	Sitting	20	8			
	Resting/sleeping	16	10	16.36	5	0.006*
Witnesses	Not witnessed	87	46			
	Nurse	44	20			
	Other	3	7	5.76	2	0.056#
Injuries	No injury	68	33			
	Bruise	8	5			
	Pain	18	6			
	Laceration/Graze	31	25			
	Fracture/ Swelling/ Strain	9	4	3.73	4	0.44
Severity	AIMS level 2& 3	16	7			
	AIMS Level 4	105	50			
	AIMS level 5	11	10			
	AIMS Level 6	2	6	7.78	3	0.05#
Totals		134	73			

* p<0.05, # Trend p<0.1

Table 3: Factors relating to the fall event

Factors relating to the patient

There were significant differences in patient related factors that were reported as contributing to the falls. For fallers with neurocognitive disorder, being confused or disorientated was likely to be reported as being a causative factor in the fall (n=100, 74.6%). Psychiatric symptoms were more likely reported as a contributor to falls sustained by those in the mental disorders group, as were blood pressure issues, urinary tract infection/incontinence issues, previous mobility issues, falls history, obesity and inappropriate use of mobility aid (used as a weapon determined by medical chart review).

	Neurocognitive Disorder (n=134)	Mental Disorder (n=73)	X2	df	p
Confusion/disorientation	100	31	21.037	1	<0.001**
Psychiatric symptoms	7	11	5.768	1	0.016*
Orthostatic hypotension	5	11	8.516	1	0.004*
Medication effects	15	7	0.128	1	0.720
Urinary tract infection/incontinence	7	10	4.502	1	0.034*
Visual impairment	4	5	1.697	1	0.193
Foot wear	4	2	0.01	1	0.920
Sedation	15	3	2.987	1	0.084
Unsteady gait	47	17	3.074	1	0.080
Previous mobility issue	15	17	5.288	1	0.021*
Mechanical restraint	0	1	1.845	1	0.174
Inappropriate use of mobility aid	5	9	5.539	1	0.019*
Behavioural disturbance–intrusiveness	16	6	0.68	1	0.407
Fall history	5	10	6.985	1	0.008*
*** p<0.05, ** p<0.01**					

Table 4: Patient related factors contributing to falls

Factors related to medications

There were a total of 151 different medications taken in the 24 hours prior to the fall. Most fallers took more than one prescribed medication (M=6.42 medications, SD=3.64 and range 0-16). There was no between group difference in the number of medications taken, Z=-0.061, p=0.951 (Mann-Whitney U), but for 15 medications there were significant between group differences observed in the frequency of medications taken in more than 10 fall events (n=32), these are listed in Table 5 below.

n	%	Medication	Neurocognitive Disorders (n=134)	Mental Disorders (n=73)	X2	df	p
60	29.0	Paracetamol	44	16	3.400	1	0.183
58	28.0	Cholecalciferol	29	29	7.663	1	0.006**
52	25.1	*Sodium Valproate*	46	6	17.126	1	0.001**
50	24.2	Aspirin	26	24	2.683	1	0.03*
49	23.7	Metformin	42	7	20.601	1	0.001**
44	21.3	*Lorazepam*	37	7	9.239	1	0.01*
42	20.3	Coloxyl/Senna	18	24	11.047	1	0.001**

42	20.3	Movicol	17	25	13.582	1	0.001**
38	18.4	*Quetiapine*	23	15	0.361	1	0.336
36	17.4	*Mirtazapine*	27	9	2.012	1	0.109
33	15.9	*Risperidone*	28	5	6.957	1	0.005**
31	15.0	Lactulose	25	6	4.043	1	0.032*
27	13.0	Atorvastatin	22	5	3.815	1	0.05*
24	11.6	Frusemide	19	5	2.477	1	0.086
22	10.6	Pantoprazole	17	5	1.695	1	0.143
21	10.1	Calcium Carbonate	17	4	2.693	1	0.101
21	10.1	*Olanzapine*	5	16	17.146	1	0.001**
20	9.7	*Haloperidol*	16	4	2.86	1	0.239
19	9.2	Esomeprazole	14	5	0.734	1	0.392
17	8.2	*Sertraline*	11	6	0	1	0.595
17	8.2	Thyroxine	8	9	2.535	1	0.094
16	7.7	*Oxazepam*	8	8	1.649	1	0.156
13	6.3	*Clonazepam*	13	0	7.557	1	0.023*
12	5.8	Gliclazide	11	1	4.047	1	0.037*
12	5.8	*Citalopram*	9	3	0.588	1	0.443
12	5.8	Metoprolol	7	5	0.229	1	0.423
12	5.8	Irbesartan	4	8	5.502	1	0.023*
11	5.3	Simvastatin	9	2	1.485	1	0.188
11	5.3	Thiamine	8	3	2.874	1	0.238
11	5.3	Mixtard	5	6	1.892	1	0.147
10	4.8	*Diazepam*	9	1	2.938	1	0.087
10	4.8	*Escitalopram*	8	2	1.073	1	0.300
10	4.8	*Lithium*	3	7	5.553	1	0.024*

* p≤0.05, ** p<0.01

Table 5 show medications that were taken by individuals within 24 hours of a fall.

Only medications that were taken on at least 10 occasions where a fall occurred are included.

CNS medications are in italics.

Table 5: Medications taken 24 hours prior to a fall event (n=207)

Discussion

In this study falls sustained by older adults admitted to two acute OAMHS were investigated according to whether their primary diagnosis was a mental or neurocognitive disorder. Neurocognitive Disorders are classified in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) as disorders such as the dementias, delirium, amnesic disorders and disorders previously defined in the DSM-IV (Fourth Edition) [19] as 'other cognitive disorders', where 'cognitive deficits are the primary manifestation of the disorder' ([16], p591) Mental disorders in DSM-V include disorders such as schizophrenia, depression and bipolar disorder where although cognitive deficits are present they are not the primary manifestations of the disorder [16,18]. Chapter five of the ICD-10 [20], 'Mental and behavioural disorders-(F00-F99)' include disorders of psychological development with the exception being the disorders listed (F00-F10) 'neurocognitive, including symptomatic, mental disorders'. The disorders covered in Chapter 6 'diseases of the nervous system-(G00-G99)' include inflammatory, systemic or degenerative diseases of the central nervous system.

Factors relating to falls

There were differences in the factors related to falls in the older adult patients with neurocognitive and mental disorders in this study. Patients with a mental disorder (affective disorders, schizophrenia and delusional disorders or substance abuse disorders) were more likely to sustain a fall due to symptoms of their mental disorder and side effects from psychotropic medications (orthostatic hypotension). The injuries sustained were more likely to require medical intervention or further investigative procedures (AIMS level 5–Tables 3 and 4). Medication effects, medical co morbidities and mental state issues such as paranoid and unpredictable behaviour have been previously shown to increase the risk of falls [7]. It is likely that older adults with mental disorders are likely to have mild to moderate cognitive impairments that put them at risk of falls due to altered executive functioning and judgement rather than gait disturbance, confusion/disorientation and the severe cognitive impairment seen in patients with a neurocognitive disorder/dementia [21,22]. Changes in reaction time and coordination that is often experienced with depression also increases fall risk, as it can alter mobility and balance [23,24].

Confusion and disorientation were more commonly associated with falls for those patients in this study with a neurocognitive disorder. Confusion and disorientation related to dementia has been highlighted to be an overwhelming cause for falls in many studies [12,25,26]. Some suggest that cognitive impairment forms a continuum from mild to severe [27,28] and that falls can be aligned to this trajectory [29-31]. Older adults who only sustained occasional falls may have subtle age-related changes in the prefrontal cortex leading to failures of executive control, whereas those older adults who were recurrent fallers may have more advanced brain ageing that is associated with generalized cognitive decline [32]. Better staffing levels, increased supervision, diversional therapy and better training for patient care staff could reduce the falls risk in this patient group [33].

Unwitnessed falls

In this study 87 (68%) of falls occurring in the neurocogntive group were unwitnessed. In 34 (25%) of falls the patient was reported to be wandering (mobilising with no purpose) and in 54 (40%) the reporter did not know what the patient was doing directly prior to the fall. Although the injuries sustained by this group of patients tended to be less serious (AIMS level 4 or less suggesting need for medical review and minor treatment such as suturing or dressing) this suggests a lack or surveillance or supervision. Although close observation of patients, particularly those prone to falling, goes a long way to preventing falls [34] this should by no means be a "fix all" solution to falls management. The use of untrained staff (sitters, attendants or companions) with little understanding of neurocognitive or mental disorders to supervise patients [35] is becoming common in OAMHS to provide cost effective supervision of patients prone to falling. In many instances untrained staff are unable to determine the difference between BPSD and symptoms that indicate deteriorating mental state in older adults with a mental disorder, so provide inappropriate or inadequate care that may increase the risk of falling (for example failing to recognise symptoms of psychosis that increase patient agitation). Consistently, patient mix in existing services is an important issue [36] and in older adult mental health services the patients are admitted primarily by age rather than diagnosis with mental and neurocognitive psychoses not differentiated. This reduces the opportunity for nursing staff to develop interventions to reduce the risk of falling for those patients with a mental disorder, as patients with neurocognitive psychoses dominate staff time and resources [37].

Medication

The more medication taken by an older adult, the greater the risk of falls, and in some instances medication is associated with the highest frequency and severity of falls in an older adult mental health services [13]. High rates of poly-pharmacology have been reported in psychiatric hospitals [38]. Medication with strongest links to an increased risk of falling includes serotonin reuptake inhibitors and tricyclic antidepressants [39], antipsychotic agents [40], benzodiazepines and anticonvulsants [25]. Many medications can cause side effects such as hypotension/orthostatic hypotension, extrapyramidal effects, slowed reactions, and symptoms like dizziness, syncope, and weakness, which increases the risk for falls by affecting gait, balance and mobility [41]. They may also cause sedation and sensory disturbances that alter perception [42] and level or alertness and anticholinergic effects that may contribute to risk of falls by increasing the need for ambulation to meet toileting needs [43].

The use of medication is an important therapeutic measure in treating mental disorders and BPSD. However psychotropic medications are over prescribed in mental health settings [13,44] with some suggesting there is little relationship between the type of psychotropic drug prescribed and the symptoms for which it had been dispensed [45,46]. Examining psychotropic medications associated with falls in this study identified high use (more than five occasions) of mood stabilisers (Sodium Valproate), benzodiazepines (Loarazepam, Oxazepam, Clonazepam, and Diazepam), antipsychotic medications (Queitapine, Risperidone, and Haloperidol) and antidepressants (Mirtazapine), in the 24 hours prior to the fall in the absence of diagnosed psychosis.

Interestingly the frequency of psychotropic medication prescribed to older adults with purely a mental psychoses who fell was quite low (n=89, 26.8%) compared with those in the neurocognitive group (n=243, 75.2%). In these groups Risperidone was more commonly taken by those who fell. Risperidone which is considered first line management in agitated dementia with delusions [47] was the antipsychotic of choice in this study with patients experiencing a neurocognitive disorder. Although atypical antipsychotics were found to be safe and efficacious in elderly mental health clients [48], antipsychotics as a class of medication have been associated with the greatest level of fall risk in both dementia specific and mental health inpatient and community settings [42]. Long term use increases falls risk however initiation has been associated with higher fracture rates [40]. In an expert consensus guidelines series the recommendation was an antipsychotic drug alone, for agitated dementia and a consideration to adding a mood stabilizer [49].

Although there is some literature that suggests that Sodium Valproate is helpful in treating BPSD [50], recent reviews question the efficacy and tolerability of Sodium Valproate in BPSD [51]. Konovalov, Muralee [52] suggest that anticonvulsant mood stabilizers should not be recommended for routine use in the treatment of BPSD citing that of 7 RCTs of anticonvulsant therapy in BPSD published only one showed significant improvement compared to placebo, while five showed no statistical difference and one showed significant worsening of BPSD in the treatment group compared to placebo. Lonergan and Luxenberg [53] in their Cochrane systematic review corroborated earlier findings that "valproate preparations are ineffective in treating agitation among demented patients, and that

valproate therapy is associated with an unacceptable rate of adverse effects" p2. Although these prescribing practices are consistent with current local prescribing practices for patients with BPSD [54], the high incidence of falls associated with Sodium Valproate identified in current data is concerning.

There is a fine line between appropriate medication management and chemical/pharmacological restraint, especially in terms of managing behaviour [55]. Australian national policy and local Mental Health legislation compel clinicians to use the least restrictive environment [56]. The use of mechanical and physical restraint within the OAMHS is considered to contravene best practice principles (mechanical restraint was associated with a patient fall on only one occasion in this study) leaving medication as the most appropriate option to manage behavioural disturbance. Generally the most frequently prescribed medications for behavioural/psychological problems are benzodiazepines [57] and this was the case in this current study. Although many patients have reported the use of medications (sedation) to be more acceptable than other measures of restraint [58] one needs to consider the risk to benefit ratio of administering medication that increases the risk of falling. In this study, 22 falls were reported to be sustained as a direct consequence of medication and a further 34 falls were attributed side effects of a medication; 18 to sedation and 16 to orthostatic hypotension (Table 4). While the authors are not advocating the use of mechanical or physical restraint, there is an urgent need to adopt more conservative medication practices and more careful titration of medications that are known to increase the risk of falling in OAMHS.

What was a pleasing finding was the number of medication to reduce the harms associated with falls, for example Cholecalciferol (Vitamin D3) which is associated with decreasing the risk of fractures in elderly patients [59] and calcium supplements, were given routinely. Although used primarily to treat cardiac co-morbidities a number of patients who fell received Atorvastatin, Irbesartan or Simvastatin (Table 5). Although available data regarding the use of Statins is mixed there is some evidence to suggest that their use is associated with a decreased risk of falling [60].

There were very few instances where agents to treat dementia such as cholinesterase inhibitors (Donepezil, n=1) and Memantine (n=4) were administered 24 hours prior to a fall. This is surprising given the number of falls sustained by patients with a primarily neurocognitive disorder. This may reflect infrequent use in the two OAMHS or that these agents are not associated with falls as the effect that these agents have on falls is not known [42].

Appropriate use of pharmacological agents is needed to treat older patients with severe and enduring mental disorders and BPSD. There is also a need for specialist trained staff to increase non-pharmacological behavioural measures or interventions which can provide training and promote psychological, social, environmental and sensory interventions [44] for older adults admitted to OAMHS. Improved assessment of falls risk on admission and appropriate interventions and supervision are needed to reduce the risk of falls. Increased surveillance, separating older adults in distinct cohorts where those with mental disorders are managed separately from those with a neurocognitive disorders, good medication management and increasing funding for specialist equipment such as pressure alarms, high-Low beds and hoists would reduce the risk of falls in OAMHS.

Conclusion

Older adults are at increased risk of sustaining a fall while admitted to an inpatient OAMHS. In this study it was identified that older adults with a mental disorder and older adults with BPSD have different characteristics that put them at risk of falling. Older adults with mental disorders are more at risk of falling due to factors related to their mental disorder such as paranoia and depressive symptoms and medication side effects and tend to suffer more severe injuries. Those with a neurocognitive disorder are at risk of falling due to confusion and disorientation and were more likely to be unwitnessed or associated with wandering. This study highlights the need for health professionals to receive appropriate training to assess and manage falls risk in patients admitted to OAMHS and to be able to identify the specific risks to each based on their medical diagnosis and level of cognitive functioning.

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