

Factors determining eligibility and access to subacute rehabilitation for elderly people with dementia and hip fracture

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Abstract

With hip fracture and dementia increasing in incidence in the global ageing population, there is a need for the development of specific procedures targeting optimal treatment outcomes for these patients. This paper looks primarily at the factors that limit access to subacute rehabilitation services as a growing body of evidence suggests that access to timely inpatient rehabilitation increases functional outcomes for patients both with dementia and without. Information was gathered by searching electronic data bases (SCOPUS, Medline, CINAHL, Health Source Nursing/Academic Addition, Psychinfo and the Cochrane Library) for relevant articles using the search terms dementia OR Alzheimer* AND hip fracture AND subacute rehabilitation OR convalescence for the period 2005–2015. Abstracts were scanned to identify articles discussing eligibility and access. A total of nine papers were identified that directly addressed this topic. Other papers discussing success or failure of rehabilitation and improved models of care were also reviewed. Barriers to access discussed in the literature include information management, management of comorbidities, attitudes, resource availability, and the quality of evidence and education. By identifying these factors we can identify strategic points of intervention across the trajectory of prevention, treatment and rehabilitation that may improve outcomes for this growing group of vulnerable patients. Emerging best practice for these patients is also discussed.

Keywords

dementia, hip fracture, subacute rehabilitation, health service structure, health service delivery

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Introduction

The combined presentation of dementia and hip fracture in the elderly is emerging as a significant health issue worldwide. Globally, the numbers of older people, incidence of hip fracture and of dementia are all increasing rapidly. Importantly, many of the largest increases are within developing countries for which data and health services for the aged are undeveloped (Ferri et al., 2006; World Health Organisation (WHO), 2007). Dementia increases the risk of falling by a factor of 1.9–3.5 (Baker, Cook, Arrighi, & Bullock, 2011; Van Doorn et al., 2003). Hip fracture, one of the most significant consequences of these falls, is expected to have risen from 1.7 million global cases in 1990 to 6.3 million by 2050 (Auais, Morin, Nadeau, Finch, & Mayo, 2013).

The social, emotional and economic cost of these injuries is significant. It has been estimated that of the 16,500 Australians who broke their hip (2006–2007) and were admitted to hospital, most were aged 65 or over and more than half were over 85 years. Of this population, 6% died in hospital, 11% were discharged to a residential aged care facility, not previously their place of residence, and less than 50% could walk as well as they did pre-fracture by 12 months – at which time a further 15% had died (Collins & Allbon, 2010). In New South Wales, 24–29% of people over the age of 65 admitted to hospital with hip fracture have an observed or inferred diagnosis (respectively) of dementia (Scandol, Toson, & Close, 2013). Nationwide, 4,256 patients are admitted to hospital each year with fractured hip with dementia recorded as a secondary diagnosis (Australian Institute of Health and Welfare (AIHW), 2012). The average cost to the health system of each fall injury episode for people 65 year and older in New South Wales, Australia has been estimated to be AUS\$3906 (Watson, Clapperton, & Mitchell, 2010).

These figures are similar to those of other countries of North America and Europe where data is also readily available. In Canada, for example, individuals with dementia account for 23.9% and 83.5% of all hip fractures that originate from the community and long-term care settings (Seitz et al., 2014). Projections suggest that by 2041 the incidence of hip fractures in Canada will increase nearly four-fold, with an annual increase in economic burden of \$2.4 billion per year (McGilton et al., 2012). Improving the outcomes for this growing, complex group of patients is becoming a priority.

Within developed countries, most elderly people with hip fracture are admitted to surgery (Jain, Basinski, & Kreder, 2003). From this point they may be referred to subacute inpatient rehabilitation or lower intensity rehabilitation within the hospital or discharged to receive outpatient, community or private rehabilitation services in-home or within an aged care facility. The immediacy, intensity and duration of rehabilitation received depend on many factors. However, elderly hip fracture patients who receive subacute inpatient rehabilitation starting within 24 hours of surgery have greatest functional recovery (Dillingham, 2007; Resnick, Wells, Brotemarkle, & Payne, 2014).

Patients with dementia have limited access to subacute inpatient rehabilitation in many countries (McGilton et al., 2012). This is possibly due to a belief that outcomes will be disappointing (Muir & Yohannes, 2009). However, in one of the few randomized control trials examining rehabilitation outcomes in hip fracture patients with dementia, 91% of patients with mild and 63% of patients with moderate dementia were living independently three months after post-operative intensive geriatric rehabilitation compared with controls (67% and 17%, respectively) (Huusko, Karppi, Avikainen, Kautiainen, & Sulkava, 2000). Indeed, patients with mild dementia were as successful as those with no dementia at

returning to independent living at three months. Importantly, all participants in the randomized control trial above were walking and living independently prior to admission with a hip fracture.

Other studies have also noted good results following rehabilitation for hip fracture patients with dementia where these patients were included (e.g. Dillingham, 2007; Ghisla et al., 2007; Heruti, Lusky, Barell, Ohry, & Adunsky, 1999; Lenze et al., 2007; Rolland et al., 2004; Shyu et al., 2013). In a systematic review of the impact of cognitive impairment on rehabilitation outcomes in elderly patients admitted with a femoral neck fracture, the author concluded that the literature on this topic was too heterogeneous to make any robust conclusions, including on what may constitute best practice rehabilitation for these patients (Muir & Yohannes, 2009). Identifying the best practices and resources required to do this, including to maintain the gains in function and mobility which optimally will enable this patient population to continue living at home (van Wyk et al., 2014), is a topic of increasing interest as the magnitude of this health care issue grows with the ageing population.

Identifying the barriers to patients with dementia accessing subacute rehabilitation and increasing their opportunity for optimal recovery is a key part of improving progress in this area. Here we report on those barriers identified from published literature and examine a number of models of improved care that show promise in addressing these barriers.

Methods

Electronic databases (SCOPUS, Medline, CINAHL, Health Source Nursing/Academic Addition, Psychinfo and the Cochrane Library) were searched for relevant articles using the search terms dementia OR Alzheimer* AND hip fracture AND subacute rehabilitation OR convalescence for the period 2005–2015.

A total of 189 papers were identified that met the search criteria after removal of duplicates and those in a language other than English. Abstracts were scanned to identify articles discussing factors affecting access to rehabilitation by patients with dementia. We identified 35 papers which had bearing on this topic of which 16 papers addressed the topic substantively and nine directly.

A grey literature search was limited to the hospital protocols and guidelines provided by local hospitals and health services (in New South Wales and the Australian Capital Territory, Australia).

Results

A number of themes emerge from the literature addressing access to rehabilitation in the elderly patient with dementia and hip fracture. These have been grouped under five main headings below. We also report examples of new models of care where one or more of these themes are addressed at different parts of the prevention–hospitalisation–rehabilitation and/or re-fracture trajectory (or cycle) to promote rehabilitation success.

Management of information, patient prioritisation and scheduling

Hospital admissions and discharge processes may fail to capture and make available relevant information about a patients' cognitive status and thereby limit access to appropriate and

timely rehabilitation services. A study that examined the frequency and pattern of diagnostic coding for dementia and delirium in elderly hip fracture patients in Sweden found these to be far lower in hospital admission records than the incidence of these disorders as established by other studies (Hedman, Ljunggren, Grafström, & Strömberg, 2005). These authors found that institutional traditions, attitudes and local policies (or the lack thereof) rather than the patient's condition determined whether this information was available for planning and treatment. Post-operative discharge documentation for hip fracture (and stroke patients) in one US medical centre also highlighted a significant frequency of omissions – particularly those recording components of functional and cognitive ability at discharge, and risk of falls (Kind, Thorpe, Sattin, Walz, & Smith, 2012). Here, omissions were associated with delays in writing discharge summaries greater than 24 hours and the responsibility falling to junior staff members. Such omissions may affect post-operative care for several months before being reviewed.

Failure to adequately capture details about a patient's pre-admission cognitive status leaves dementia patients vulnerable to preventable complications such as inappropriate pain management, delirium and cause avoidable delays in instigating appropriate resources and attitudes to encourage early mobilisation. Omissions in the hospital discharge summary which serve as the principal, and sometimes only, means of communicating a dementia patient's future plan of care to the post-hospital team also increases the likelihood of sub-optimal therapy and delays. Further hospital system failures in which patients are poorly prioritized and scheduled, including 'time wasted on evaluations of inappropriate referrals' have also been identified as barriers to accessing timely and appropriate rehabilitation for dementia patients (Resnick et al., 2014).

Management of comorbidities and avoidable medical complications

Rescheduling appointments for rehabilitation and cancellations associated with medical complications and their treatment also impacts on access and early participation in rehabilitation for any patient, and patients with dementia in particular. Elderly patients with hip fracture commonly present with multiple comorbidities in addition to dementia. Some of these are chronic conditions, others are readily treatable and independent predictors of poor rehabilitation success (e.g. poor nutrition, decreased serum albumin and folic acid levels, dyspnoea and visual impairment; Ghisla et al., 2007; Lieberman, Friger, & Lieberman, 2006). Dementia patients also experience a high incidence of delirium pre- and post-operatively: approximately 66% of patients experiencing delirium during hospitalisation have dementia (Olofsson, Lundström, Borssén, Nyberg, & Gustafson, 2005). Delirium is also largely preventable (Adunsky, Levya, Heimb, Mizrahic, & Arada, 2002) and associated with a number of underlying issues including poorly managed pain, the assessment of which can be complicated in the dementia patient as discussed above. If delirious during hospitalisation, patients are more likely to end up in long-term care and experience a much higher rate of mortality during hospitalisation and within four months (Olofsson et al., 2005).

Within-hospital falls are a serious risk and disrupt a patient's trajectory to recovery (Taylor, Delbaere, Close, & Lord, 2012). For the dementia patient these risks are amplified by prolonged immobilisation, whether through the medical complications discussed above, lack of comprehension or compliance to participate in early mobilisation or through over diligent nursing. Staff who are either too time-poor or uninformed about the

need and techniques to encourage activity and early return to function may inadvertently contribute to this problem. Not giving patients any opportunity to perform daily activities at their own pace will not promote independence, and delirious patients who are more dependent than the non-delirious, may suffer more from 'excessive' care (Olofsson et al., 2005).

Professional, community and patient attitudes

American researchers report that many orthopaedic surgeons, particularly those new to practice and those who have practiced for more than 20 years, do not believe in the value of physical therapy and, therefore, are less likely to order therapy for elderly hip fracture patients (with or without dementia) (Resnick et al., 2014). This, coupled with persistent beliefs in the community that rest and restriction of physical activity will facilitate recovery and prevent falls no doubt contributes confusion on this subject and effects compliance by dementia patients and their carers even where subacute rehabilitation is available (Rydholm Hedman, 2007).

However, the treatment received by dementia patients is impacted by the attitudes of all levels of health care staff. One group of researchers (Nilsson & Rogmark, 2011) suggested that patients with dementia and the very old received less physical and occupational therapy in the hospitals in which they worked because of a prevailing attitude that 'talking to these patients was useless'. Whilst such attitudes are rarely articulated so frankly in the literature, a study that examined the experience of dementia patients with hip fractures and their carers' concluded that 'the ignorance and poor behaviour of professional staff are a major determinant of access to rehabilitation' (Rydholm Hedman, 2007). Here, carers felt that staff were often disrespectful to patients and evaluation of suitability for rehabilitation was commonly based only on staff opinion, and did not take into account the pre-fracture physical ability of the patient. Unpredictable or disruptive behaviour was poorly managed (largely due to ignorance, ageist attitudes and poor training of staff) and resulted in poor medical assessment of pain and provision of analgesia. In this study only 13% of cognitively impaired patients received physiotherapist rehabilitation with many patients returned promptly to long-term care because staff were unable or unwilling to deal with difficult behaviours (Rydholm Hedman, Heikkilä, Grafström, & Strömberg, 2008). In Canada, those patients coming from a nursing home are considered collectively as having a decreased baseline level of functioning that limits their potential post-operative functional gains (Seitz et al., 2014).

Resource availability

Lack of resources to provide appropriate rehabilitation and services to elderly hip fracture patients with dementia is a concern expressed commonly in the literature. Where these are limited it is not uncommon for the best services to be offered to those with the perceived highest likelihood of full functional recovery, i.e. those without cognitive impairment (Muir & Yohannes, 2009). Whilst this may be addressed with future research and cost benefit analyses, in some countries there are also policy barriers to overcome.

In North America, medical insurance regulates that access to inpatient rehabilitation facilities requires evidence that patients can follow commands. This automatically discriminates against those with evidence of depression, apathy or cognitive impairment,

despite evidence that these conditions do not reduce the benefit of subacute rehabilitation in an inpatient rehabilitation facilities (Lenze et al., 2007). Canadian nursing home residents are not eligible for inpatient rehabilitation because of limited resources and return directly to these facilities where some limited rehabilitation services are available (Beaupre et al., 2007; Seitz et al., 2014). Whilst for some patients this may provide the comfort of more familiar surroundings, resources in aged care facilities are rarely capable of providing optimal rehabilitation. The effect of these automatic exclusions must be considered in assessing the literature on this topic. In Canada, coming from a nursing home is a significant risk factor for poor outcome post-hip fracture repair surgery, independent of whether the patient has dementia or any other comorbidity (Beaupre, Jones, Johnston, Wilson, & Majumdar, 2012; Seitz et al., 2014).

Availability of appropriate evidence to inform decision making

Published literature appears divided on the effectiveness of rehabilitation for the elderly dementia fracture patient (Ghisla et al., 2007). Many studies report cognitive impairment as a risk factor for failure of rehabilitation and increased mortality or exclude patients with dementia, or with severe dementia (e.g. Baker et al., 2011; Heruti et al., 1999; Lieberman et al., 2006). As discussed above, nursing home residents are also the subject of specific studies. There are few studies specifically examining the benefit of rehabilitation for the elderly hip fracture patient with dementia, or the most appropriate delivery of rehabilitation for these patients (Muir & Yohannes, 2009; van Wyk et al., 2014). It is important not to confuse these two (or more) groups of literature. Failure of non-dementia-specific rehabilitation practices for hip fracture patients with dementia is not evidence of rehabilitation being inappropriate for this group of patients. As the available evidence influences the attitudes and decisions of health professionals it is important to emphasise this point.

In addition to this, several other issues should be considered when using existing evidence to inform decision making. For example, length of stay (LOS) is often reported in studies of geriatric hip fracture rehabilitation but is an unsatisfactory outcome measure of the success for patients with dementia (Scandol et al., 2013). Those patients returning promptly to aged care facilities following surgery will have minimum LOS, but may experience high mortality and reduced return to function (Beaupre et al., 2012). Conversely, patients receiving dementia-supportive subacute inpatient rehabilitation may require a longer LOS but this is likely to be more successful and cost-effective if it results in greater rates of return to independent living (Muir & Yohannes, 2009).

Across the board, a decline or fluctuation in a number of physical and cognition functions is associated with hospitalisation and surgery in the elderly (McPhail, Varghese, & Kuys, 2014). There is evidence that the cognitive and functional deterioration often observed post-surgery may persist for up to a year before improving (Shyu et al., 2013). Our understanding of the long-term trajectory of elderly hip fracture patients with dementia is evolving and this requires specific examination.

Best practice models of care

Emerging now in the literature are studies that are examining best practice models of rehabilitation for these patients, recognising the growing number of people with dementia

admitted for hip fracture and the human and financial cost of poor post-surgical treatment. Within the examples discussed below, many of the barriers identified above are addressed.

In Canada, an interdisciplinary rehabilitation program called the Patient-Centred Rehabilitation Model is being trialled (McGilton et al., 2013). This focuses on geriatric care including management of dementia and delirium, education and support for healthcare professionals from an Advanced Practice Nurse, and family support and education. The authors report increasing evidence that this model can increase the proportion of hip fracture patients with dementia who return home post-discharge. Importantly there is an emphasis on staff's ability to relate well and communicate appropriately to patients who may have difficulty understanding words or following directions. The environment is modified to accommodate the patients' changing needs and the daily activity schedule of the patient is modified in order to maintain a balance between high and low arousal states. Staff are taught to follow the steps of asking, cueing and demonstrating, before doing the activity for the patient. The model emphasises partnering with families to gain knowledge about the patient, including raising awareness of the patient's unmet needs, such as pain, often manifesting in difficult behaviours.

In Sweden, Comprehensive Geriatric Assessment (CGA) including the use of a Delirium-Check-list has been instigated to improve the care of elderly hip-fracture patients and appears to be a prerequisite for successful rehabilitation (Gustafson, 2012). A significant reduction in the incidence of delirium can be made where proactive geriatric consultation is instigated (Marcantonio, Flacker, Wright, & Resnick, 2001). CGA is the first part of a two-stage process of orthogeriatric co-managed care ('comprehensive care') with the overall objectives of improving physical and psychological functions and reducing hospitalisation, long-term care placement and mortality (Pioli, Davoli, Pellicciotti, Pignedoli, & Ferrari, 2011). This includes avoiding inappropriate surgical delays and a reduction in the overall number of days of immobility thereby endorsing an early ambulation with full weight bearing as tolerated. This model aims to ensure an uninterrupted transition between the different care levels that patients need after fracture repair and before returning home. This includes a structured discharge plan tailored to the individual patient that identifies patients who would benefit from more intensive rehabilitation, those who will probably need a higher level of care post rehabilitation and defines the continuing care that needs to be provided. It also ensures that the patient has access to available services and resources in the community.

In Taiwan, comprehensive subacute care that includes geriatric consultation, rehabilitation starting from the first day after surgery and continuing with in-home rehabilitation, structured discharge assessment including home environment, patient and carer needs assessments, referral, and reminders for clinical follow-up has been made available to all but the most severely affected by dementia. Good results were found to be further improved when rehabilitation, nutritional and mental health support were extended to a year (Shyu et al., 2013). Ongoing in-home rehabilitation is also being investigated in other studies (Cook et al., 2011; van Wyk et al., 2014).

Many of these barriers are also addressed in the minimum standards prepared to guide health care providers on the management and care of older patients with hip fracture across the health system in New South Wales, Australia (Agency for Clinical Innovation (ACI), 2014). These recommend: orthogeriatric clinical management of patients (i.e. collaborative management), adequate pain management (making sure cognitive impairment does not result in reduced analgesia), surgery within 24 hours and that all possible causes of cancellation of surgery be addressed (including the prevention and treatment of

comorbidities including delirium, and the coordination of services); early mobilisation (within 24 hours with early assessment by rehabilitation clinicians to determine the patient's rehabilitation requirements, including appropriate intensity and care setting, based on patient need and service availability) and re-fracture prevention (including the treatment of osteoporosis and the monitoring and assessment of the success of this model).

Conclusion

There is growing evidence that older adults with mild to moderate dementia who receive intensive subacute rehabilitation after surgical repair of a hip fracture may gain comparable benefit in physical function as cognitively intact patients. Barriers to this patient group getting access to subacute inpatient rehabilitation include failures in hospital information management, patient prioritisation and scheduling; sub-optimal management of comorbidities and avoidable medical complications including delirium; poor professional, community and patient attitudes and education; limited resource availability and the need for further research and critical assessment of the available evidence to inform decision making. In addition to the advances evident in novel projects to improve models of care based on multi-disciplined teams, we recommend a greater awareness of evidence-based standards that include all aspects of care including early mobilisation, delirium management and pain management. Changing attitudes to these patients and their potential for improved outcomes will assist professionals, patients and their carers embracing improved models of care.

Authors' Note

The views expressed in this work are the views of its author/s and not necessarily those of the Australian Government.

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