



Hip Fracture As A Potential Contributor To Cognitive Decline And Dementia

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Abstract

This paper reviews the possible link between hip fracture and cognitive decline and dementia. There is a growing body of clinical research literature that indicates that cognitive decline is associated with the presence of delirium and that delirium is a predictor of dementia. Hip fracture is thought to be an independent factor that may lead to cognitive decline and dementia. It is suggested that cost implications should not become an obstacle to determining the best course of rehabilitation when delirium signals the need for preventive measures to protect the welfare of patients with hip fracture.

Introduction

Hip fracture

Every year there are falls in institutional environments such as care home and hospitals as well as in people's own residences. In particular, resulting hip fractures cause prolonged admission in medical facilities and increased physical and psychological trauma to patients. Between 1986 and 2005, the annual mean number of hip fractures has been reported in the United States as 957.3 per 100,000 for women and 414.44 per 100,000 for men [1]. However, there is wide variation in incidence of hip fracture in the 50 years and older patient grouping world-wide [2].

Body Mass Index (BMI) has been found to be one factor that may contribute to the incidence of hip fracture in elderly nursing home residents where low BMIs are associated with an increased risk [3]. However, not all studies concur and find other factors that are equally influential in determining risk of incidence in hip fractures such as bone mineral density, direction of the person's fall, and functional capacity [4].

A growing number of reports have indicated that the incidence of hip fractures is associated with the diagnosis of dementia [5,6].

Furthermore, some researchers argue that dementia is an independent risk factor for falling because those with dementia have a greater incidence of falling than those without dementia [7]. Evidence has been presented of hip fractures leading to cognitive decline in patients [8].

Falls are found to be a major cause of

morbidity and mortality in dementia [9]. Some researchers suggest a causal link between fractures and dementia where hip fractures have slightly higher risk of dementia and multiple fractures exhibit a significantly higher risk of developing dementia [10].

Cognitive decline and dementia

Not all presentations involving cognitive decline result in dementia and conversely, other signs such as delirium can mask the signs of underlying dementia whether it is from Alzheimer's disease or from small vessel disease, usually the result of cerebrovascular accident or stroke. Delirium should not be dismissed or under-estimated and there is a growing respect for this viewpoint among researchers and clinicians.

Prior to the onset of delirium, dementia may be absent; however, if delirium then follows then it becomes an indicator of the cognitive decline or change that is associated with dementia [11,12]. In hip fracture patients who do not have dementia, delirium becomes the main predictor of dementia 6-months later [13].

Deterioration in cognitive functioning is one of the signs of a dementia-process. However, there are over 14 different types of dementia and each is characterised by origin or a specific set of symptoms [14]. Vascular dementia, usually resultant from small vessel disease, stroke [15], multi-infarcts (as symptomatic of multi-infarct dementia) or transient ischaemic attacks (TIAs), has a step-wise presentation of cognitive decline as compared with Alzheimer's disease which can have an insidious and gradual deterioration

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Conclusions

Cognitive status at admission is often a determinant of rehabilitation from a hip fracture [18,19]. A growing concern among clinicians is the fact that cost of rehabilitation can often become a significant factor in treatment [20] with wide variations across continents, e.g., the United States, Canada and China [21,22]. It is hoped that indicators of possible cognitive decline such as delirium are acted upon in a timely manner with the best interest of patients at the forefront, as opposed to factoring cost implications and management policy.

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References

1. Brauer CA, Coca-Perraillon M, Cutler DM, Rosen AB. Incidence and mortality of hip fractures in the United States. *JAMA*. 2009;302(14):1573-1579.
2. Sing CW, Lin TC, Bartholomew S, et al. Global epidemiology of hip fractures: a study protocol using a common analytical platform among multiple countries. *BMJ Open*. 2021;11(7):e047258.
3. Hayes WC, Myers ER, Morris JN, Gerhart TN, Yett HS, Lipsitz LA. Impact near the hip dominates fracture risk in elderly nursing home residents who fall. *Calcif Tissue Int*. 1993;52(3):192-198.
4. Greenspan SL, Myers ER, Kiel DP, Parker RA, Hayes WC, Resnick NM. Fall direction, bone mineral density, and function: risk factors for hip fracture in frail nursing home elderly. *Am J Med*. 1998;104(6):539-545.
5. Fernando E, Fraser M, Hendriksen J, Kim CH, Muir-Hunter SW. Risk Factors Associated with Falls in Older Adults with Dementia: A Systematic Review. *Physiother Can*. 2017;69(2):161-170.
6. Dautel A, Eckert T, Gross M, et al., Multifactorial intervention for hip and pelvic fracture patients with mild to moderate cognitive impairment: study protocol of a dual-centre randomised controlled trial (OF-CARE). *BioMed Central Geriatrics*. (2019): 19(125).
7. van Doorn C, Gruber-Baldini AL, Zimmerman S, et al. Dementia as a risk factor for falls and fall injuries among nursing home residents. *J Am Geriatr Soc*. 2003;51(9):1213-1218.
8. Melton LJ 3rd, Beard CM, Kokmen E, Atkinson EJ, O'Fallon WM. Fracture risk in patients with Alzheimer's disease. *J Am Geriatr Soc*. 1994;42(6):614-619.
9. Allan LM, Ballard CG, Rowan EN, Kenny RA. Incidence and prediction of falls in dementia: a prospective study in older people. *PLoS One*. 2009;4(5):e5521.
10. Tsai CH, Chuang CS, Hung CH, et al. Fracture as an independent risk factor of dementia: a nationwide population-based cohort study. *Medicine (Baltimore)*. 2014;93(26):e188.
11. Friedman SM, Menzies IB, Bukata SV, Mendelson DA, Kates SL. Dementia and hip fractures: development of a pathogenic framework for understanding and studying risk. *Geriatr Orthop Surg Rehabil*. 2010;1(2):52-62.
12. Goldberg TE, Chen C, Wang Y, et al. Association of Delirium With Long-term Cognitive Decline: A Meta-analysis. *JAMA Neurol*. 2020;77(11):1373-1381.
13. Krogseth M, Wyller TB, Engedal K, Juliebø V. Delirium is an important predictor of incident dementia among elderly hip fracture patients. *Dement Geriatr Cogn Disord*. 2011;31(1):63-70.
14. Thompson SBN. *Dementia and memory: a handbook for students and professionals*. Aldershot: Ashgate. 2006.
15. Thompson SBN, Morgan M. *Occupational therapy for stroke rehabilitation*. London: Chapman & Hall. 1996.
16. Thompson SBN. Memory decline, Alzheimer's disease and vascular dementia: the clinical picture. *Journal of Cognitive Rehabilitation*. 2022;20(2): 12-18.
17. Thompson SBN. *Trauma psychology: clinical case histories, reviews, research*. Portsmouth: Blackwell-Yale-Academic. 2016.
18. Heruti RJ, Lusky A, Barell V, Ohry A, Adunsky A. Cognitive status at admission: does it affect the rehabilitation outcome of elderly patients with hip fracture?. *Arch Phys Med Rehabil*. 1999;80(4):432-436.
19. Muir SW, Yohannes AM. The impact of cognitive impairment on rehabilitation outcomes in elderly patients admitted with a femoral neck fracture: a systematic review. *J Geriatr Phys Ther*. 2009;32(1):24-32.
20. Stuart B, Gruber-Baldini AL, Fahlman C, et al. Medicare cost differences between nursing home patients admitted with and without dementia. *Gerontologist*. 2005;45(4):505-515.
21. Zeng Y, Luo J, Ou L, et al. The impact of medical insurance on medical expenses for older Chinese: Evidence from the national baseline survey of CLHLS. *Medicine (Baltimore)*. 2019;98(39):e17302.
22. Oremus M, Aguilar SC. A systematic review to assess the policy-making relevance of dementia cost-of-illness studies in the US and Canada. *Pharmacoeconomics*. 2011;29(2):141-156.