Hip Pain During Walking and Cognitive Status Early Post-operation Predict Discharge Destination in Men with Hip Fracture: A Prospective Study

Ms. Intonia CHOW Hoi Wan[1]
Senior Physiotherapist
Queen Elizabeth Hospital
7 May 2018

Chan ACM[1], Chan DWL[1], Yung BPK[1], Lee KB[2], Li WWY[2], Pang MYC[3]

[1]Physiotherapy Department, Queen Elizabeth Hospital

[2]Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital

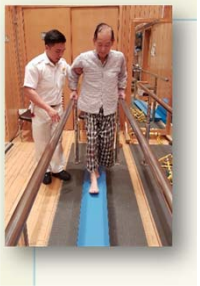
[3]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University

Background

Hip fracture is a well-known geriatric fracture that requires hospitalization

- International clinical guidelines
- Coordinated & multidisciplinary care approach
- Provide right care at the right time

(Scottish Intercollegiate Guidelines Network (SIGN) Clinical Guideline, 2009; Handoll et al., 2011)



Physiotherapists rehabilitate the patients achieving their maximum function and potential → community re-integration

(SIGN Clinical Guideline, 2009; NICE Clinical Guideline, 2010)

Background

Successful surgery

Adequate rehabilitation

- Become dependent
- Unable to regain pre-fracture status
- Permanent disability
- Fail to return to original residential status (Cameron et al., 2010)

Earlier

Predicting discharge destination
→ Better discharge planning

Results from Literature Review

16 Variables for predicting discharge destination in previous studies

• Age	• Pre-fracture health status
• Gender	• Pre-fracture functional state
• Marital status	• Pre-fracture ADL state
• Place of fall	• Pre-fracture residency
• Type of fracture	• Availability of caregiver
• Type of surgery	• Length of hospital stay
• Time to surgery	• Cognition
• Post-operative complications	• Physiotherapy training

(Cree & Nade, 1999; Kagaya et al, 2005; Chiu, 2007; Hershkovitz et al, 2007; Al-Anl et al, 2008; Deakin et al, 2008; Hagino et al, 2011; Handoll et al, 2011; Moppett et al, 2012; Jackson et al, 2013; Nanjayan et al, 2014)

Knowledge Gap

Predictors

- Age
- Health status
- Pre-fracture functional status
- Pre-fracture ADL state
- PT training
- Availability of caregiver

- Post-operative complications
- Time to surgery

NOT Predictors

- Gender
- Type of fracture
- Type of surgery
- Place of fall
- Length of hospital stay
- Marital status

Potential Predictors

- Level of hip pain
- Early post-operation mobility function
- Cognitive function
- Self-efficacy on performing exercise

Objective

To identify potential predictors of returning home at early hospitalization stage after hip fracture in community-dwelling older men and women

Ethical approvals were granted by:

- Research Ethics Committee (Kowloon Central/ Kowloon East)
- Human Subjects Ethics Sub-committee of the Hong Kong Polytechnic University

Subject Recruitment

- Age ≥ 65
- With unilateral hip fracture managed operatively in QEH under the care of Department of Orthopaedics & Traumatology

Inclusion Criteria	***Exclusion Criteria***
• Have literacy in Chinese	• Inability to walk before hip fracture
• Live at their own home	• Pathological hip fracture/ with malignancy in origin
	• Associated injuries such as upper limbs fracture or pelvic fracture
	• Major concomitant injuries such as multiple trauma due to road traffic accident, rheumatoid arthritis
	• Admission after hip fracture occurred more than 24 hours
	• Inability/ unwilling to give informed consent
	• Inability to read & write Chinese
	• Language barrier

Methodology

All recruited subjects were cared under integrated, standardized multidisciplinary clinical pathway for fragility hip fracture

Underwent operation after hip fracture

Active Rehabilitation

Telephone interview at 6 week post-operation

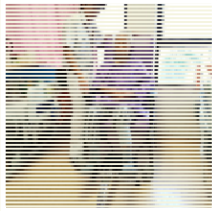
→ Final discharge destination

Pre- & Post-operative Physiotherapy

Chest Physiotherapy

Pain & Swelling Control

Mobilization Exercise

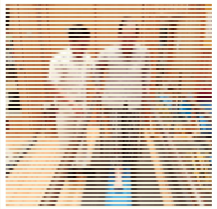


Strengthening Exercise

Bed Mobility, Transfer & Ambulation Training

Endurance & Cardiovascular Training

Balance, Gait & Functional Training



Patient & Caregiver Empowerment

Potential Predictors & Outcome Measures

Potential Predictors (Independent Variables)	Outcome Measures
Pain During Walking	• Numeric Pain Rating Scale (NPRS)
Mobility Function	• Elderly Mobility Scale (EMS)
Functional Independence in Daily Living	• Modified Barthel Index (MBI)
Cognition	• Mini-Mental State Examination (MMSE)
Self-efficacy	• Self-efficacy for Exercise (SEE) Scale

Potential predictors were assessed at 2nd ambulatory training session

Statistical Analysis

Dependent variable is **dichotomous**
(whether or not the subjects are discharged back to their own home at 6 weeks post-operation)

Multiple logistic regression analysis using 'Enter' method for determining the significant predictors & their respective odds ratios

For Male Subjects:
Returning Home: -2.123+(-0.024)*age+(-0.753)*pain during walking+0.357*MMSE+0.005*SEE+(-0.003)*EMS+0.005*MBI

For Female Subjects:
Returning Home: 0.587+(-0.032)*age+(-0.034)*pain during walking+0.029*MMSE+0.03*SEE+(-0.06)*EMS+0.041*MBI

- SPSS (Version 24.0) used for statistical analysis
- Level of significance alpha-value: 0.05


Results

Results & Outcome

80 community-dwelling older subjects with unilateral hip fracture managed operatively were recruited.

Mean age: 84.2±6.0 years; 32 men & 48 women

In 6th week, 50% and 69.6% of men and women were able to return to home respectively.

Results

Demographic Data	Number (Percentage)
• Documented dementia	7 (8.7%)
• Availability of caregiver	
- Pre-operation	21 (26.2%)
- Post-operation	8 (10%)
• Delayed operation (>48 hours)	24 (30.0%)
- Confusion	1 (1.2%)
- Anaemia	2 (2.5%)
- Cardiac problem	4 (5.0%)
- Long holiday	5 (6.2%)
- Others (e.g. pending relatives' decision)	12 (15.0%)
• Number of medication	
- 0	0 (0.0%)
- 1-2	19 (23.8%)
- 3-7	61 (76.2%)

Results – Male Subjects

Male	*p* value	95% CI (confidence interval)	Odds ratio
Age	0.831	0.78-1.22	0.98
NPRS 2nd walk	0.04	0.23-0.97	0.47
EMS 2nd walk	0.95	0.64-1.61	1.01
MBI 2nd walk	0.93	0.86-1.18	1.01
MMSE post-op	0.04	1.01-2.03	1.43
SEE Scale	0.93	0.95-1.06	1.00

After adjusting for age, less hip pain during walking & better cognitive status at 2nd ambulatory training session were found to be significant predictors for returning home.

Results – Female Subjects

Female	*p* value	95% CI (confidence interval)	Odds ratio
Age	0.67	0.84-1.12	0.968
NPRS 2nd walk	0.84	0.69-1.35	0.97
EMS 2nd walk	0.86	0.59-1.57	0.96
MBI 2nd walk	0.32	0.96-1.12	1.04
MMSE post-op	0.71	0.89-1.20	1.03
SEE Scale	0.18	0.99-1.08	1.03

Traditional social role of Chinese female is to take care of their life-long partners and families → emotional component seemed to be an important element

Results

Classification Table[a]

GENDER		Observed		Predicted BACKTO_HOME_OAH No	Predicted BACKTO_HOME_OAH Yes	Percentage Correct
Male	Step 1	BACKTO_HOME_OAH	No	12	1	92.3
			Yes	3	10	76.9
		Overall Percentage				84.6
Female	Step 1	BACKTO_HOME_OAH	No	2	8	20.0
			Yes	[illegible]		88.5

Overall accuracy (or hit rate) of the logistic regression function for male subjects was 84.6% → good discriminatory power to differentiate between "able to return home group" & "unable to return home group"

Clinical Significance

Patient Stratification Care Approach

Less hip pain
Better Cognition

Likely

- Patient empowerment
- Support services in community

More hip pain
Poorer Cognition

Unlikely

- Caregiver empowerment
- Suitable rehabilitation unit/ nursing home

2nd ambulatory training session

Smooth Transition

Discharge

Service Planning

Clinical Significance

Predictors

- Age
- Health status
- Pre-fracture functional status
- Pre-fracture ADL state
- Availability of caregiver
- PT training

Non-modifiable predictors

Modifiable predictors

Predictors

- Hip pain during walking
- Cognitive status

Modifiable predictors

Goal-oriented service

- Better symptomatic management (pain control)
- Optimize restorative rehabilitation (365-day service)
- Provide psychosocial support (patient / caregiver empowerment)

ALL can receive appropriate level of care!

Conclusion

Hip pain during walking & cognitive status early post-operation were significant predictors for discharge destination in men with fractured hip

Needs identification → Stratified care → Early, safe & smooth discharge

Efficient utilization of levels of care

Reduce hospital stay & enhance quality of life

Facilitate patient flow & better healthcare resource allocation

Reference

- Al-Ani, A., Samuelsson, B., Tidermark, J., Norling, Å., Ekström, W., Cederholm, T. & Hedström, M. (2008). Early operation on patients with a hip fracture improved the ability to return to independent living. *The Journal of Bone and Joint Surgery, 90,* 1436-42.
- Chiu, K. C. (2007). Predictors of old-age-home placement in Hong Kong Chinese elderly persons after hip fracture. *Asian Journal of Gerontology and Geriatrics, 2,* 69-77.
- Cree, A. K. & Nade, S. (1999). How to predict return to the community after fractured proximal femur in the elderly*. Australian & New Zealand Journal of Surgery, 69,* 723-25.
- Deakin, D. E., Wenn, R. T. & Moran, C. G. (2008). Factors influencing discharge location following hip fracture. *Injury International Journal of the care of the Injured, 39,* 213-8.
- Hagino, T., Ochiai, S., Sato, E., Watanabe, Y., Senga, S. & Haro, H. (2011). Prognostic prediction in patients with hip fracture: risk factors predicting difficulties with discharge to own home. *Journal of Orthopedics and Traumatology, 12,* 77-80.
- Handoll, H.H.G., Sherrington, C. & Mak, J.C.S. (2011). Interventions for improving mobility after hip fracture surgery in adults. *Cochrane Database of Systematic Reviews.* DOI: 10.1002/14651858.CD001704.pub4.
- Hershkovitz, A., Kalandariov, Z, Hermush, V., Weiss, R. & Brill, S. (2007). Factors affecting short-term rehabilitation outcomes of disabled elderly patients with proximal hip fracture. *Archives of Physical and Medical Rehabilitation, 88,* 916-21.
- Jackson, J. P., Whisner, S. & Wang, E. W. (2013). A predictor model for discharge destination in inpatient rehabilitation patients. *American Journal of Physical Medicine and Rehabilitation, 92 (4),343*-50.
- Kagaya, H., Takahashi, H., Sugawara, K., Dobashi, M., Kiyokawa, N. & Ebina, H. (2005). Predicting outcomes after hip fracture repair. *American Journal of Physical Medicine and Rehabilitation, 84 (1),* 46-51.
- Moppett, I. K., Wiles, M. D., Moran, C. G. & Sahota, O. (2012). The Nottingham Hip Fracture Score as a predictor of early discharge following fractured neck of femur. *Age and Ageing, 41,* 322-6
- Nanjayan, S. K., John, J., Swamy, G., Mitsiou, K., Tambe, A. & Abuzakuk, T. (2014). Predictors of change in 'discharge destination' following treatment for fracture neck of femur. *Injury International Journal of the Care of the Injured, 45,* 1080-4.
- National Institute for Health and Care Excellence (NICE) Clinical Guideline. (2010). Venous thromboembolism: reducing the risk for patients in hospital. CG92, 1-59. nice.org.uk/guidance/cg92

Thank You

Outcome Measures

Numeric Pain Rating Scale (NPRS)	• 11-point scale (0-10) • Subjective intensity of pain experienced during walking
Elderly Mobility Scale (EMS)	• Score: 0 (totally dependent) to 20 (independent) • 7 functional activities: bed mobility, transfers, locomotion, balance and key position changes
Modified Barthel Index (MBI)	• Score: 0 to 100 • Measure functional independence
Mini-Mental State Examination (MMSE)	• Score: 0 to 30 • Measure cognitive ability that correlates with function in daily tasks
Self Efficacy for Exercise Scale (SEE Scale)	• Score: 0 to 90 • Self-report their confidence to engage in exercise where in the face of different barriers