

Hip protector compliance in an acute hospital setting

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ABSTRACT

Objectives. To examine compliance for a newly designed hip protector and reasons for non-compliance among elderly participants with a moderate-to-high risk of falls.

Methods. This was a descriptive observational study conducted in acute aged care wards at the Bankstown Hospital, Sydney, Australia. Seventeen in-patients aged between 71 and 95 years in the four aged care wards at the Bankstown Hospital were recruited to wear the protectors. Twelve (71%) patients had fallen at least once in the last year, whilst all of them were assessed as being at moderate-to-high risk of falling (according to the Falls Risk Assessment tool).

Results. Seventeen participants completed the study. The compliance rate was 72%. Three major reasons for non-compliance were: deterioration in medical condition (n=6), issue with laundering of hip protectors (n=4), and discomfort (n=3).

Conclusion. Hip protectors are well-tolerated by elderly patients at high risk of falls in a hospital setting. Targeting the reasons for non-compliance may improve compliance. Further robust studies are required to verify if the high compliance rate could be maintained in the long-term, and efficacy of hip protectors in fracture reduction.

Key words: Aged; Fractures, bone; Hip fractures; Orthopedic equipment; Patient compliance

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INTRODUCTION

The incidence of hip fractures increases exponentially with ageing, paralleling the rise in the incidence of falls and prevalence of osteoporosis.^{1,2} Hip fracture confers significant morbidity and mortality.³⁻⁶ A multifaceted approach is required to prevent hip fracture, by targeting the aetiology of falls, treatment of osteoporosis, and protection of hips from the direct physical impact of a fall.⁷

Hip protectors (HPs) are synthetic shields designed to cover and divert or absorb the force on the greater trochanter—a common point of impact during a fall, and are held in place by modified

undergarments. These protectors have been shown to reduce the risk of hip fracture.⁸⁻¹⁰ However, patient compliance has been suboptimal, due to several factors including their cost, cosmetic impact, and physical discomfort. Patients' perception of their risk of falls and fractures, motivation, and support systems are other significant factors. It has been shown that these can be improved with education.⁵ In community and residential care settings, the compliance rates for the use of HPs vary between 30 and 50% and decline over time.^{10,11} However, there have been no published data on compliance to HPs in a hospital setting. Therefore, the aims of this study were to assess compliance with use of HPs and reasons for non-compliance in elderly patients

at risk of falls in a tertiary hospital setting.

METHODS

Study population

Patients aged 70 years and over admitted to four aged care wards at Bankstown Hospital between June 2004 and August 2005 were recruited. The aged care wards comprised General Medical, Stroke Rehabilitation, General Rehabilitation and Psychogeriatric Units. Participants were included if they were current in-patients in one of the aged care wards, had fallen on one or more occasions in the past year, or were at a moderate-to-high risk of falls according to the Falls Risk Assessment tool.¹² Quality improvement activities within the hospital have indicated that patients who have fallen whilst in hospital attained moderate-to-high scores with the assessment tool.

Study procedure

Participants were recruited through referrals made by medical, nursing, or allied health staff. Consent or proxy consent (in those with cognitive impairment) was obtained from eligible patients and/or their relatives.

Prior to study initiation, an education session was directed at aged care medical, nursing and allied health staff, in order to identify suitable patients who could benefit from the use of HPs. The education also covered the benefits, shortcomings, and practicalities of HPs and patient compliance issues. Staff were also asked to report incident falls in study participants. Large study information posters were posted in prominent areas in the four aged care wards. For this purpose, small reminder posters were positioned above each of the 80 in-patient beds in these wards. One-to-one education sessions were also conducted with participants and their relatives.

Hip protectors

The HPs used in this study were made of cricket pad material; the new design had previously been evaluated to be effective by Chan et al.¹⁰ The pads could be placed into everyday undergarments. The participants purchased their own sets of HPs. The cost per set of HP and three sets of underwear fitted with pockets was AUD65 (USD48).

Study data collection

Data on age, gender, length of stay (LOS), and medical history were obtained. Falls Risk Assessment (i.e. low, moderate, or high risk) and Mini-Mental State Examinations (MMSEs) were also performed. The MMSE was performed as patients with impaired mental capacity were unlikely to understand the benefits of HPs and therefore compliance would be hindered. Compliance was checked randomly during the period the subject had been prescribed HPs, but there was no particular schedule for such checking. The date and time of checking was recorded and if the patient was non-compliant, the reason for non-compliance was recorded. The patient's compliance rate was calculated as a percentage of the number of episodes they were observed to be wearing HPs through random checks conducted by the research team during 24- to 72-hour intervals.

Ethics approval

The study received approval from the South West Sydney Area Health Service Human Research Ethics Committee.

RESULTS

A total of 17 participants (8 males and 9 females) completed the study; their ages ranged from 71 to 95 years. Seven (41%) and five (29%) of the 17 patients had a principal diagnosis of fracture and stroke respectively and the remaining five (29%) had other medical diagnoses. Twelve (71%) had a history of falls. Fifteen subjects were assessed as at high risk and two as at moderate risk of falls using the Falls Risk Assessment tool.

Their mean hospital LOS was 40 (standard deviation, 20; range, 9-67) days. The MMSE was performed on 15 of the 17 participants; mean score being 22/30, eight subjects scored ≥ 25 .

A total of 103 episodes of compliance were monitored for these 17 patients (ranging from 2 to 24 episodes for each subject). Individual compliance rates for wearing HPs ranged from 38 to 100% with a mean compliance of 72%. Of the 103 episodes monitored, the causes of 29 episodes of non-compliance are detailed in the **TABLE**. The main reasons were: deterioration in the patient's medical

TABLE
Reasons for non-compliance in wearing hip protectors (n=17 in-patients)

Categories of non-compliance	No. of episodes
Patient factors	
Deterioration in medical condition	6
Worsening cognition	2
Worsening incontinence	2
Factors related to hip protectors	
Issues with laundering of hip protectors	4
Discomfort	3
Physical barrier to self-toileting	1
Cost leads to reduced frequency of usage	1
Others	
Staff unaware that patients need assistance wearing them	2
Pads missing	1
No reasons recorded	7
Total	29

or mental state (8/29, 28%); and problems with the laundering of HP garments (4/29, 14%).

One patient suffered a fall whilst participating in the study. This patient was wearing the HP at the time of fall and sustained a small laceration to the back of the head.

DISCUSSION

This is the first study to examine HP compliance rates in a hospital setting. The study showed that compliance rate was high among elderly in-patients at moderate-to-high risk of falls. The HPs were well-tolerated by most patients with only three of 29 episodes of non-compliance being due to physical discomfort. Other factors boosting adherence might be: patient's ownership of HPs (i.e. purchasing their own pair could have motivated wearing them), and involvement of the multidisciplinary study team. These results agree with previous studies from residential and community settings,^{5,13-16} although direct comparison is difficult due to lack of standardised measurements for HP compliance in the current literature.^{5,13-17} The association between the age, gender and cognitive function and the compliance (wearing the HP) was not examined due to our small sample size.

Other barriers to wearing HPs identified previously have been their cost and need for laundering.^{6,15} To mimic actual clinical situations, our participants had to purchase the HPs; therefore, the direct impact of cost on compliance could not be assessed. However,

issuing free HP as in previous studies did not appear to confer improved compliance.^{16,17} Issues with laundering accounted for 14% of episodes of non-compliance in this study.

The limitations of our study include: insufficient patient numbers recruited, and insufficient follow-up in four of 17 patients (only 1-2 compliance monitoring episodes). Thus, the compliance rate observed in this study should be interpreted in caution; the high rate needs further verification by a more rigorous study. Despite extensive education sessions, the motivation of hospital staff to refer patients declined with time. Other in-patient care issues (e.g. medical illness) might have also made staff reluctant to refer. In addition, many patients were recruited near the time of discharge with some exhibiting uncertainty in terms of committing to the purchase of HPs, leading to delay in study entry and reduced follow-up time. The low recruitment rate might also have been due to the multicultural setting of Bankstown Hospital. Language barriers and cultural appropriateness pertaining to the use of HPs might have affected recruitment.

CONCLUSION

This study shows that hospitalised elderly in-patients at risk of falls appear to comply with the use of HPs. However, a more rigorous study and further follow-up of participants in community or residential care settings could assist in determining if adherence to HPs would be maintained long-term and whether their use leads to hip fracture reductions.

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