FALLS LINKS

Volume 7, Issue 2, 2012 Newsletter of the NSW Falls Prevention Network

Welcome

This issue includes:

- Mini review: Warfarin, Atrial Fibrillation, falls and risk of haemorrhage in older people
- CEC Post Fall assessment and Management guideline
- New Resources and Conferences information
- Abstracts - the latest abstracts from the research literature

The NSW Falls Prevention Network Forum will be held on Friday 1st June 2012 please go to our Falls Network Website for further information.

The 5th Biennial Australian and New Zealand Falls Prevention Society (ANZFPS) Conference will be held in Adelaide at the Convention Centre from the 28-30th October 2012, further information is available at www.anzfpsconference.com.au/

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NSW FALLS PREVENTION NETWORK

Neuroscience Research Australia
Discover. Conquer. Cure.

NSW FALLS PREVENTION NETWORK FORUM

Date: *Friday 1st June 2012*
Time: *9.00am - 4.00pm*
Venue: *Wesley Conference Centre, 220 Pitt St Sydney*

Photos © Queensland Health

Key Focus: Working with Special Populations

Inside this Issue

"Falls Prevention is Everyone's Business"

NSW FALLS PREVENTION NETWORK

This mini review was undertaken as part of the workplan of the NSW Falls Prevention Network. One of the issues that had been identified in post fall management was the limited understanding of the relationship between the use of warfarin and falls injury particularly serious haemorrhage in older people.

Warfarin, Atrial Fibrillation, Falls and Risk of Haemorrhage in Older People

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Summary

Warfarin is currently the most widely prescribed oral anticoagulant used in older people. One of the most common indications for its use is in atrial fibrillation (AF) to prevent thromboembolic stroke disease. There is a robust literature to support the use of warfarin in stroke prevention in AF but there is still evidence of underutilisation in older people with AF due to concerns around the increased risk of bleeding, particularly, intracranial haemorrhage (ICH). Falls risk is often cited as a reason for non-prescription or discontinuation of warfarin, although objective evidence as to what constitutes a level of risk where the risk of harm from bleeding outweighs the benefits in reduction of stroke is anything but clear. The decision around the use of warfarin needs to be tailored to the needs of an individual. If falls risk is to be used as a reason for not prescribing warfarin then there needs to be an objective assessment of level of risk as well as an attempt to modify risk based on known risk factors for falls. More research is required to develop more robust algorithms and risk tables that include falls risk to assist clinicians and patients making decisions around the risks and benefits of warfarin.

Introduction

This article discusses some of the challenges faced when using warfarin for AF in older people. It covers the evidence in relation to the risks and benefits of warfarin use particularly in relation to falls and fall related injury.

Atrial Fibrillation

Atrial fibrillation (AF) is a common cardiac arrhythmia and the incidence increases from approximately 5% in people over the age of 65 years to 10% in those over 80 years of age [1]. In Australian GP encounters, AF presents at a rate of 0.9 per 100 encounters for all ages rising to 2.0 per 100 encounters in those aged 65-74 and 3.0 per 100 encounters with patients over 75 years of age [2].

A recent report estimated the prevalence of AF in Australia in 2008-09 to be 240,000 people (1.1% of the population) with over half of these people being over the age of 75 years [3].With the changing demographics, this number will increase further over the coming decades. [4]. The estimated cost of AF to the Australian economy in 2008-09 was approximately $1.25 billion per annum which includes medical costs, cost of long term care and lost productivity output or $5,200 per annum for each person with AF [3]. This is double the per person cost of obesity and higher than the per person cost for cardiovascular disease or osteoarthritis [3].

Atrial fibrillation is associated with a substantially increased risk of thromboembolic stroke. The average stroke risk in AF patients is estimated to be approximately 5% per annum (range 3-8%) with a number of factors impacting on overall risk [3-5]. Stroke in AF patients is often more severe, associated with more disability and higher mortality (40-90% increase in mortality) when compared to those patients without AF ([3, 6]. Frailty and age also increases embolic stroke rates (RR = 3.5, 95% CI 1.0-12.0, $p<0.05$))[7]. A study by Gage et al ([8] found that ischemic stroke rates were 13.7 per 100 patient years in people at high risk of falls and 6.9 in other patients, indicating that those patients who were at higher risk for falling were also at higher risk for stroke due to the presence of comorbidities and polypharmacy in these patients [8, 9].

Stroke Risk stratification

Risk factor stratification scores have been developed and are commonly used in clinical practice to determine stroke risk and allow for a more informed conversation around the most appropriate pharmacological agent for stroke prevention. $CHADS_2$ is probably the most commonly used tool in

practice to quantify the risk of stroke (Table 1). Factors increasing stroke risk in AF included in the $CHADS_2$ score include congestive cardiac failure, hypertension, age > 75 years, diabetes and previous stroke ([8]. A $CHADS_2$ score of 0-1 is considered low risk for stroke, 2-3 is moderate risk and ≥4 is considered high risk [8].

Table 1 $CHADS_2$ Risk Stratification for Stroke in patients with AF ([10]

$CHADS_2$ Risk Stratification	
Risk Factor	**Points**
Congestive heart failure	1
Hypertension	1
Aged > 75 years	1
Diabetes	1
Stroke	1

Stroke Risk	
$CHADS_2$ Score	Adjusted Stroke Rate (per 100 patient years)
0	1.9
1	2.8
2	4.0
3	5.9
4	8.5
5	12.5
6	18.2

Warfarin use in AF

Warfarin is an oral vitamin K antagonist originally used as a pesticide. It is now commonly used in humans to prevent and treat a number of conditions including atrial fibrillation (AF), deep vein thrombosis, pulmonary embolic disease and prosthetic heart valves ([11].

Warfarin remains the most widely used oral anticoagulant (OAC) for preventing stroke in patients with atrial fibrillation (AF). A review and meta-analysis of 29 RCTs using antithrombotic therapy for patients with AF found that compared with controls, adjusted dose warfarin reduced stroke by 64% (95% CI, 49-74%) and antiplatelet agents reduced stroke by 22% (95% CI, 6-35%) [12]. Warfarin was more effective in reducing stroke in AF compared to antiplatelet therapy (RR 39%, CI 22-52%). Warfarin is also more effective than anti-platelet agents in prevention of systemic embolism in patients with non-valvular AF [13].

Warfarin therapy needs to be closely monitored to ensure that a therapeutic INR (International Normalised Ratio) is between 2-3, for optimal stroke prevention. This is not always easily achieved or maintained and can be affected by a number factors including medication compliance, drug and food interactions and alcohol use [6].

Bleeding complications

One of the main issues with warfarin therapy is the increased risk of bleeding including intracranial heamorrhage (ICH). Whilst gastrointestinal bleeding is more commonly reported, it is the ICH that is more commonly associated with mortality and poor functional outcomes, particularly in the older population. The rates of warfarin associated ICH reported in the literature vary from 0.3% to 2.5 % per annum and this range reflects the variability in the patient populations in each study [6, 12, 14]. Participants in some of these studies were younger (mean age 69-71) and at lower risk for bleeding and had been on warfarin prior to the trials [6, 12]. Hart et al reported no significant increase in major bleeding when they compared a number of large AF trials in a meta-analysis and found an annual rate of ICH of 0.3% to 0.6% in warfarin users compared to 0.1% in controls [6, 12, 14]. Those studies with patients with a higher mean age (>75 years) had a higher incidence of ICH, (1.8-2.5 % per year) [6]. Another study extracting data from a large set of patients found that long term anticoagulation therapy significantly increased both the incidence of ICH and associated mortality [15]. It should also be borne in mind that risk of bleeding and ICH increases with age and is independent of anticoagulant therapy [16].

Studies of ICH in patients on OAC have concluded that patients taking OAC have 2-6 fold greater risk of death from traumatic brain injury (TBI) especially when the INR is >4 [17-19]. The incidence of ICH may be low in those taking warfarin, but the consequences can be devastating. The 30 day mortality rate has been found to be around 40-50% [8, 17, 20] and this is significantly higher than in patients taking neither warfarin nor anti-platelet agents (15%). One study offers some possible explanations for this high mortality rate including delays in both diagnosing ICH by CT scan and the initiation and completion of anticoagulation reversal therapy [17].

Bleeding Risk and Falls

A number of risk factors that increase bleeding in AF patients on oral anticoagulants have been identified and include older age (>80 years), intensity of anticoagulation, history of heart disease, uncontrolled hypertension, anaemia or history of bleeding, neuropsychiatric impairment, cerebrovascular disease and use of other drugs such as antiplatelet agents [6, 8, 12, 21]. Patient education has been found to be an important factor with respect to bleeding during anticoagulation therapy with those patients not given enough anticoagulation education having higher numbers of major bleeding episodes [22]. Patients often have negative perceptions on the use of OAC due to the dietary restrictions and regular blood tests and compliance can be an issue.

"Falls risk" is often considered to be a contraindication to warfarin therapy in older people although what is actually meant by "falls risk" is not always clear and consistent. A fall can be the precipitant to a bleeding event yet the literature defining bleeding risk on OAC fails to adequately define, measure or factor in falls risk into decision making algorithms. A summary of ICH in studies of patients taking OAC who had experienced a fall are presented in Table 2 [8, 15, 23, 24]. In one large retrospective study, patients on long term OAC were at an increased risk of ICH compared with those not on long term OAC[15] whereas in studies with smaller populations there was no significant increase in ICH on long term OAC. The study by Gage et al [8] found that ICH was increased in subjects at "high risk" of falls (2.8 versus 1.1 per 100 patient years) and patients on warfarin had a higher 30 day mortality than those not on OAC; 51.8% v 33.6 %(p=0.007). The definition of high risk was not clearly or objectively defined.

Whilst falls risk may be poorly defined or factored in to decision making around appropriate and safe prescription of OAC, what is clearer is the post fall management strategies for people on OAC. An older person on anticoagulant medication who has had a fall and presents to ED or their Medical Practitioner with a closed head injury, should be considered at high risk of possible ICH and appropriate assessment undertaken. Investigations carried out should include consideration of a CT scan of the head. The patient should be managed according to the NSW Institute of Trauma and Injury Management (NITIM) Guidelines for the Initial Management of Closed Head Injury in Adults [25]. If the CT scan shows any bleeding then aggressive reversal of anticoagulation should commence as this may reduce the high mortality rate from ICH. If the CT is normal the patient still needs to be observed for delayed bleeding according to NITIM Guidelines.

Bleeding Risk Score

There are a number of bleeding risk prediction methods for AF and falls risk has been considered and included only in the $HEMORR_2HAGES$ score which includes excessive falls however this method is rarely used. The HAS-BLED score is recommended by the European Society of Cardiology and Canadian Cardiovascular Society. The HAS-BLED risk score for bleeding includes the following risk factors; hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile INR, age [over 75 years], and drugs/alcohol used concomitantly (1 point for each risk factor with a maximum of 9 points). A HAS-BLED score of ≥3 increases the risk of major bleeding [26]. The authors conclude that the use of risk stratification should aid in the individual risk/benefit analysis of using an OAC such as warfarin [26]. Falls or fall risk is not considered as a variable associated with bleeding risk in the HAS-BLED score. Despite this, one of the most commonly cited reasons for not prescribing warfarin in older people with AF is concern about an increased risk of falls. In a report using mathematical modeling rather than prospective follow up of real people, it has been estimated that older people taking warfarin have to fall about 300 times a year for the risk of using warfarin to outweigh its benefits [27]. In a review by Sellers et al [28] looking at AF, falls and bleeding, the authors concluded that the risk of falling should not be a contraindication to using warfarin. Older AF patients at risk of falls but with a $CHADS_2$ score of ≥2 would benefit from warfarin therapy even with an increased risk of hemorrhage.

Newer anticoagulants

A range of newer anticoagulants have been registered and approved for use in Australia. [29] . These include rivaroxaban and dabigatran, both of which have been found to be faster acting (within 30 minutes compared to 36-72 hours for warfarin), with a shorter half life and not requiring the routine monitoring that is required for warfarin [29]. The RELY trial compared dabigatran with warfarin and found that dabigatran (at both high and low-doses) was superior to warfarin in stroke prevention and rates of ICH were lower (0.23 to 0.30 compared to 0.74 with warfarin ($p<0.0001$) [30]. Dabigatran has been approved for use in the 'Prevention of stroke and systemic embolism in patients with non-valvular atrial fibrillation and at least one additional risk factor for stroke' by the Therapeutics Goods Administration (TGA)[31]. One of the major concerns in relation to use of dabigatran is the absence of an antidote to reverse the effects of the drug in the event of bleeding. In November 2011 a safety advisory alert on the risk of bleeding relating to the use of dabigatran (Pradaxa) was issued by the TGA [32].

This drug is currently not available on PBS for nonvalvular AF and stroke prevention. However it is highly likely that more anticoagulants will be developed and released over time as well as antidotes to enable rapid reversal in the event of a bleed.

Conclusions

Warfarin remains underused in people with AF, leaving them at an increased risk of thromboembolic stroke. In older patients it has been estimated that only 50% of eligible patients receive warfarin [22, 27]. Failure to prescribe treatment from which a patient stands to benefit is difficult to measure objectively but simply using "falls risk" without any attempt to quantify or modify risk of falls should not be considered acceptable practice.

Clearly more research is required to address the issue of falls risk and use of warfarin so as to develop clinical algorithms which better define level of risk and benefit for individuals based on a number of risk factors. For the time being, clinicians, in consultation with their patients, should use the best available clinical evidence to weigh up the risk of bleeding and benefit of stroke prevention for each older person with AF. Where falls risk is considered to be a reason for not prescribing warfarin then there should be objective measurement of falls risk and a clear attempt to modify identified falls risk factors using evidence based guidelines [33].

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Author, year, country	Goal of Study	Study design, population, participants (n), mean age (range or SD) years	Outcome measures	Outcomes from Study
Bond et al 2005 [23] Canada	To compare the rates of fall related hemorrhagic injury in hospital in-patients with or without antithrombotic therapy (warfarin, aspirin, clopidogrel or heparin)	Retrospective analysis over 4 years on consecutive n-patients who fell in hospital n = 1861 (2,635falls) Mean age 71.5 (16-104) 14.4% on warfarin 20.1% on heparin 1.7% on clopidogrel 27.9% on aspirin	Any haemorrhagic injuries extracted from the case records. Serious haemorrhagic injury defined as subdural hematoma, intracerebral haemorrhages and major bruising. Inpatient falls based on incident report in falls database	10% of falls led to serious haemorrhagic injury. Persons taking warfarin were less likely to suffer a fall related haemorrhagic injury compared with persons not taking antithrombotic therapy (warfarin 6%, no therapy, 11%: p=0.01). Logistic regression showed that fall related major haemorrhage was associated with female gender (odds ratio 1.6 ;95% CI 1.3, 2.1), use of aspirin (odds ratio 1.4; 95% CI 1.1., 1.8 and use of clopidogrel (odds ratio 2.2; 95%CI, 1.1, 4.8)
Gage et al 2005 [8] USA	To determine if patients with AF at high risk of falls on antithrombotic agents are at increased risk for ICH	Retrospective analysis Records from US National Registry of Atrial Fibrillation II dataset n = 19,506 People at high falls risk: n= 1245(6.4%), mean age 83.0 (7.1), 33.5% on warfarin, 37.8% on aspirin People not at high risk of falls n=18261 (93.6%), Mean Age 79.3 (7.4), 48.9% on warfarin, 29.7% on aspirin.	High risk of falls defined by physician documentation in medical records of- "history of falls, frequent falls, tendency for falls" ICD 9 codes used for AF and ICH	This study found that patients at high risk for falls with AF had an increased rate per 100 patient years of ICH: 2.8 (1.9-4.1) versus 1.1 (1.0-1.3) (p<0.0001). Warfarin or aspirin use did not significantly affect the risk of ICH, hazard ratio for warfarin 1.0 (95% CI 0.8-1.4) and for aspirin 1.1 (95% CI 0.8-1.4). 30 day mortality: 51.8% in patients on warfarin vs 33.6% in patients not on warfarin (p= 0.007) Odds ratio 2.5 (CI 1.4-4.5, p=0.002).

Author, year, country	Goal of Study	Study design, population, participants (n), mean age (range or SD) years	Outcome measures	Outcomes from Study
Gangavati et al 2009[24] USA	To determine the prevalence and characteristics of ICH in elderly fallers presenting to ED without focal neurological findings	Retrospective cohort study Patients presenting to ED with a fall n = 404 People with ICH, n=47, mean age 82.8 (65-97) People with no ICH, n=357, mean age 82.5 (65-106)	Medication use extracted from electronic medical records. ICH confirmed by radiology Falls were defined as a sudden involuntary change from a vertical position or from a height; patients slipping off a bed and receiving a head CT were included.	11.6% of presentations had a confirmed ICH No statistically significant difference between people with and without ICH in use of Warfarin 8(17.**0%**) v 71 (19.9%), p=0.69 Aspirin 17 (36.2%) v179 (50.1%), p =0.13 Clopidogrel 2 (4.3%) v 43 (12%), p = 0.13 Significantly more ICH seen in patients on combination of aspirin and clopidogrel Aspirin + clopidogrel 1 (2.1%) vs 25 (7.0%), p=0.01 Warfarin + clopidogrel 0 (0%) v 4 (1.0%), p= 0.25 Warfarin + Aspirin 1 (2.1%) v 21 (5.9%), p = 0.20
Pieracci et al 2007 [15] USA	To determine if long term oral anticoagulants (using ICD 9 definition) increases the risk of ICH and mortality in elderly fallers.	Retrospective analysis Patients hospitalized after a fall: n = 47,717 Long term OAC: n= 1,511(3.2%), mean age 81.8 (65-101) Non OAC: n=46,206, mean age 81.7 (65-113)	ICD 9 codes for ICH and Falls	Falls were associated with traumatic fall related ICH in 2517 patients (5.1%) Patients on long term anticoagulants were more likely to sustain a fall related ICH – OR 1.5 (95%CI 1.23-1.81) In the event of sustaining an ICH, people on long term anticoagulants were more likely to die – OR 1.57 (95%CI 1.02-2.45)

CEC Draft Post Fall Assessment and Management for ALL adult patients

The Clinical Excellence Commission (CEC) was approached to review the CEC Post fall assessment and management guideline – September 2009, following a serious fall event where a patient died following an witnessed fall. In this instance the staff had undertaken observations, (including neurological), but failed to note and report fluctuating changes in cognition and as it was reported that the fall was witnessed and the patient did not hit their head, a CT scan was not ordered. As a result of a review process and analysis of SAC1 and SAC 2 (2008 and 2009) fall events it was highlighted that patients who are on anti-coagulants are at in increased risk of intracranial bleed, as well as patients with end stage renal failure, haematological disorders and chronic liver disease. This review found that there was a focus on observation using the Glasgow Comma Scale (GSC) for focal neurological deficits. Fluctuations in cognition which is manifested by restlessness, agitation and behavioural changes in older people may be a sign of a significant bleed before it is identified by GCS observation. The review found that staff were not reporting fluctuations in cognition.

In consultation with the CEC Between the Flags Program, which has been rolled out across most of NSW, it was agreed to develop the guideline according to the Clinical Emergency Response System (CERS) procedures and a revised format and algorithm has been developed. This is currently in draft format, and now circulating to Local Health Districts for implementation. Comments and feedback on this guideline can be provided to: **lorraine.lovitt@cec.health.nsw.gov.au**

This post fall guideline is for implementation in all NSW Health facilities including small rural and Multi Purpose Services (MPS). Will apply to the clinical management of aged care residents in MPS. Please note that it may not be possible for the patient to be reviewed by a Medical Officer in some Rural sites. Staff are to follow local protocols in regards to Clinical Emergency Response Systems for Clinical Review and Rapid Response.

This guideline applies to all adult patients who have had a fall: Falls and Hits Head; Falls and Does Not Hit Head; Unwitnessed Fall and replaces the CEC Post Falls & Management Guide (Revised Sept 2009).

Purpose:

The purpose is to guide immediate care following a fall in hospital. A fall event can be serious and cause injury and even death. In hospital a patient fall may be a flag that the patient's underlying medical condition could be deteriorating. The causes of falls are complex, and immediate post fall assessment and management with clinical review will help to reduce the degree of harm to the patient. In the event that a patient has an Advance Care Plan or Directive in place, symptom management will remain a priority in the plan of care.

1. Post Fall Assessment and Management for all adult falls: Algorithm (see next page)

Each box steps through the patient journey following a fall and actions for staff to take in caring for the patient that falls.

Immediate Response

Observations & Ongoing Monitoring

Communication and Documentation

2. Guidance for Post Fall Assessment and Management of all adult patient falls.

Assessment of Risk of Bleeding

Assessment for Delirium

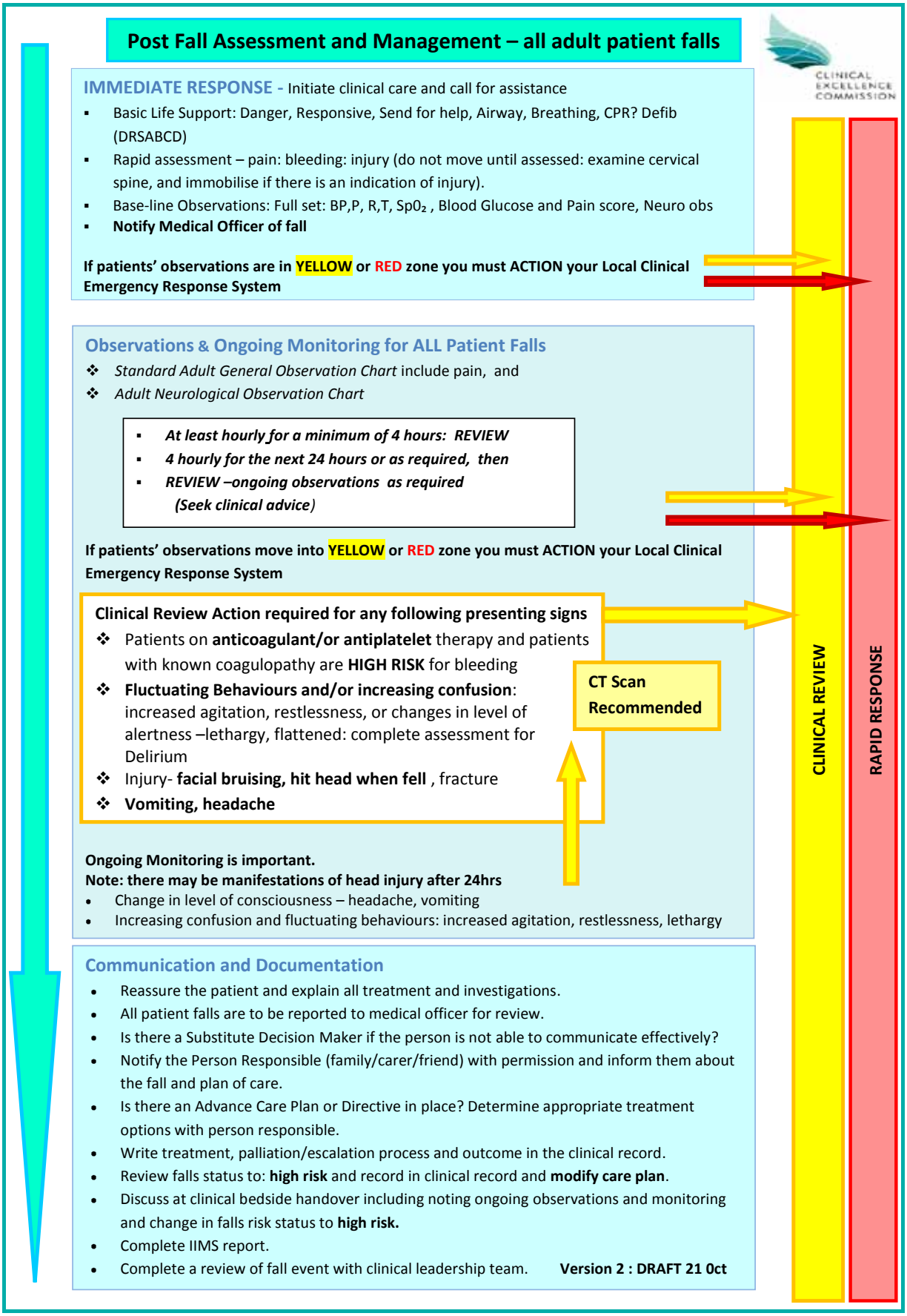
Assessment of Injury: with particular regards to injury to the head and all limbs

Assessment of Ward Environment, Equipment and level of Supervision

Indications for CT Scan

These documents are available on the CEC website at:

http://www.cec.health.nsw.gov.au/programs/falls-prevention#resources1


Post Fall Assessment and Management – all adult patient falls
CLINICAL EXCELLENCE COMMISSION
IMMEDIATE RESPONSE - Initiate clinical care and call for assistance
Basic Life Support: Danger, Responsive, Send for help, Airway, Breathing, CPR? Defib (DRSABCD)
Rapid assessment – pain: bleeding: injury (do not move until assessed: examine cervical spine, and immobilise if there is an indication of injury).
Base-line Observations: Full set: BP,P, R,T, Sp0₂ , Blood Glucose and Pain score, Neuro obs
Notify Medical Officer of fall
If patients' observations are in YELLOW or RED zone you must ACTION your Local Clinical Emergency Response System
Observations & Ongoing Monitoring for ALL Patient Falls
Standard Adult General Observation Chart include pain, and
Adult Neurological Observation Chart
At least hourly for a minimum of 4 hours: REVIEW
4 hourly for the next 24 hours or as required, then
REVIEW –ongoing observations as required
(Seek clinical advice)
If patients' observations move into YELLOW or RED zone you must ACTION your Local Clinical Emergency Response System
Clinical Review Action required for any following presenting signs
Patients on anticoagulant/or antiplatelet therapy and patients with known coagulopathy are HIGH RISK for bleeding
Fluctuating Behaviours and/or increasing confusion: increased agitation, restlessness, or changes in level of alertness –lethargy, flattened: complete assessment for Delirium
Injury- facial bruising, hit head when fell , fracture
Vomiting, headache
CT Scan Recommended
Ongoing Monitoring is important.
Note: there may be manifestations of head injury after 24hrs
Change in level of consciousness – headache, vomiting
Increasing confusion and fluctuating behaviours: increased agitation, restlessness, lethargy
Communication and Documentation
Reassure the patient and explain all treatment and investigations.
All patient falls are to be reported to medical officer for review.
Is there a Substitute Decision Maker if the person is not able to communicate effectively?
Notify the Person Responsible (family/carer/friend) with permission and inform them about the fall and plan of care.
Is there an Advance Care Plan or Directive in place? Determine appropriate treatment options with person responsible.
Write treatment, palliation/escalation process and outcome in the clinical record.
Review falls status to: high risk and record in clinical record and modify care plan.
Discuss at clinical bedside handover including noting ongoing observations and monitoring and change in falls risk status to high risk.
Complete IIMS report.
Complete a review of fall event with clinical leadership team.
Version 2 : DRAFT 21 Oct
CLINICAL REVIEW
RAPID RESPONSE

New Resources

NSW Ministry of Health
Fall-related injury hospitilisations by LHD and sex 2010-2011

This report provides aged standardised rates for Fall-related injury overnight stay hospitalisations by Local Health District and sex for people over 65 years in NSW 2010/2011. The report

http://www.healthstats.nsw.gov.au/Indicator/inj_falloldhos_lhn

Conferences/Meetings

NSW Falls Prevention Network Forum, Friday June 1st, Wesley Conference Centre

This forum will focus on health prevention strategies in special populations such as Culturally and Linguistically Diverse (CALD) and Aboriginal and Torres St Islander populations. There will also be an update on the research and report on current research in the area. The afternoon session will focus on how to motivate and encourage the older population to participate in exercise and other falls prevention activities and active lifestyles as well as motivating health professionals around falls prevention. Projects to highlight some examples will be presented. A flyer will be available shortly and registrations will open in early March.

5th Biennial Australian and New Zealand Falls Prevention Society Conference, 28th - 30th October, Adelaide Convention Centre

The main theme for this years conference is **Translating Research into practice.** Go to www.anzfpsconference.com.au/

This conference will be of interest and relevance to health professionals and others who provide care and support to older people, and who are interested in reducing the rate of falls and harm from falls. The conference showcases Australasian and international research.

Registration is now open and early bird rates apply until .

New Website

www.activeandhealthy.nsw.gov.au

Find a falls prevention exercise program in your local community.

Designed for

- General Practitioners
- Health & Community Services staff
- Community members (older people, family, friends and carers)

Search by suburb

To find a falls prevention exercise program in your local area.

Exercise programs

Have been approved for registration on this website.
Programs include: Tai Chi, Stepping On, Gentle Exercise and more.

Other highlights

- The *Staying Active and On Your Feet* booklet with exercises to do at home, and lifestyle and home safety checklists.
- Information for health professionals - falls prevention best-practice.

View the website at: **www.activeandhealthy.nsw.gov.au**

Please promote this website and provide feedback at: **www.activeandhealthy.nsw.gov.au/feedback**

NSW GOVERNMENT Health

NSW FALLS PREVENTION PROGRAM

Abstracts

Recent abstracts from the research literature

Reviews

Relationship Between Fall-Related Efficacy and Activity Engagement in Community-Dwelling Older Adults: A Meta-Analytic Review.

Schepens S, Ananda S, Painter JA, Murphy SL.

Am. J. Occup. Ther. 2012; 66(2): 137-148. Affiliation: Stacey Schepens, PhD, OTR, is Postdoctoral Fellow, Department of Physical Medicine and Rehabilitation, Institute of Gerontology, University of Michigan, 300 North Ingalls Street, 9th Floor, Ann Arbor, MI 48109-2007; schepens@umich.edu. DOI: 10.5014/ajot.2012.001156 PMID: 22394523 (Copyright © 2012, American Occupational Therapy Association).

Abstract

OBJECTIVE: Fear of falling can lead to restricted activity, but little is known about how this fear affects different aspects of people's lives. This study examined the relationship between fall-related efficacy (i.e., confidence or belief in one's ability to perform activities without losing balance or falling) and activity and participation.

METHOD: We conducted a meta-analysis of studies comparing community-dwelling older adults' fall-related efficacy to measures of activity or participation.

RESULT: . An examination of 20 cross-sectional and prospective studies found a strong positive relationship between fall-related efficacy and activity (r = .53; 95% CI [.47, .58]). An insufficient number of studies examining fall-related efficacy and participation were available for analysis.

CONCLUSION: Low fall-related efficacy may be an important barrier to occupational engagement for many older adults and warrants careful consideration by occupational therapists. Future research should explore interventions that target fall-related efficacy and examine their effects on activity performance and engagement.

External validity of physical activity interventions for community-dwelling older adults with fall risk: a quantitative systematic literature review.

McMahon S, Fleury J.

J. Adv. Nurs. 2012; ePub(ePub): ePub. Affiliation: Siobhan McMahon MSN MPH GNP-BC PhD Student College of Nursing and Health Innovation, Arizona State University, Phoenix, Arizona, USA Julie Fleury PhD RN FAAN Director, PhD in Nursing and Healthcare Innovation Program College of Nursing and Health Innovation, Arizona State University, Phoenix, Arizona, USA. DOI: 10.1111/j.1365-2648.2012.05974.x PMID: 22416905 (Copyright © 2012, John Wiley and Sons).

Abstract

AIM: To appraise the external validity of physical activity interventions designed to reduce falls among community-dwelling older adults, using the reach, efficacy/effectiveness, adoption, implementation, and maintenance framework.

BACKGROUND: Falls are a globally common, important, and a preventable problem. The efficacy of physical activity interventions to reduce falls among older adults is well established. Translation of this research into practice is slow as evidenced by persistently low proportions of older adults who engage in physical activities and the rising incidence of falls.

DATA SOURCES: Four electronic databases were searched for relevant studies published between 2000-2010. Studies that examined the effects of physical activity interventions designed to reduce falls among community-dwelling older adults were included in this review (n=46).

DESIGN: This was a quantitative systematic review with narrative synthesis. The reach, efficacy/effectiveness, adoption, implementation, and maintenance framework guided the identification, appraisal, and synthesis of indicators representing study validity.

RESULTS: The majority of studies in this review described indicators representing internal validity.

Details about indicators representing external validity were reported infrequently, limiting the generalizability of fall-preventive physical activity interventions in diverse cultures and social contexts over time.

CONCLUSIONS: To foster translational research in real world settings, additional programmatic intervention research is needed that: (i) targets diverse populations; (ii) incorporates theories of behavioural change; (iii) describes and operationalizes critical content that enables replication and translation; (iv) tests innovative measures of fall risk and physical activity; and (v) evaluates feasibility and acceptability.

Fall Prevention in Hospitals: An Integrative Review

Sandra L. Spoelstra1, Barbara A. Given1, Charles W. Given2

Clin. Nurs. Res. 2012; 21(1): 92-112

1Michigan State University College of Nursing, East Lansing MI , 2Michigan State University College of Human Medicine, East Lansing MI ,Sandra L. Spoelstra, Michigan State University College of Nursing, 500 Fee Hall, Room 500, East Lansing, MI 48824 Email: spoelst5@msu.edu

Abstract

This article summarizes research and draws overall conclusions from the body of literature on fall prevention interventions to provide nurse administrators with a basis for developing evidence-based fall prevention programs in the hospital setting. Data are obtained from published studies. Thirteen articles are retrieved that focused on fall interventions in the hospital setting. An analysis is performed based on levels of evidence using an integrative review process. Multifactoral fall prevention intervention programs that included fall-risk assessments, door/bed/patient fall-risk alerts, environmental and equipment modifications, staff and patient safety education, medication management targeted to specific types, and additional assistance with transfer and toileting demonstrate reduction in both falls and fall injuries in hospitalized patients. Hospitals need to reduce falls by using multifactoral fall prevention programs using evidence-based interventions to reduce falls and injuries.

Epidemiology and risk factors

Brain White Matter Hyperintensities, Executive Dysfunction, Instability, and Falls in Older People: A Prospective Cohort Study.

Zheng JJ, Lord SR, Close JC, Sachdev PS, Wen W, Brodaty H, Delbaere K.

J. Gerontol. A Biol. Sci. Med. Sci. 2012; ePub(ePub): ePub. Affiliation: DSc, Neuroscience Research Australia, Barker Street, Randwick, Sydney, NSW 2031, Australia. s.lord@neura.edu.au. DOI: 10.1093/gerona/gls063 PMID: 22403055 (Copyright © 2012, Gerontological Society of America.)

Abstract

BACKGROUND: White matter hyperintensities (WMHs) are associated with fall risk factors in older people including reduced cognitive functioning and impaired balance and gait. This prospective study investigated relationships between WMHs, sensorimotor performance, executive functioning, and falls in a large sample of community-living older people.

METHODS: Two hundred and eighty-seven community-dwelling people aged 70-90 years, underwent structural magnetic resonance imaging and assessments of executive function (Trail-Making Tests), sensorimotor performance (Physiological Profile Assessment), and prospective monitoring of falls. Total WMH volume was quantified using an automated method. Fallers were defined as people who had at least one injurious or two noninjurious falls during the 12-month follow-up period.

RESULTS: Participants with severe WMH burden (WMH volumes as a percentage of intracranial volume in the fourth quartile) performed poorly in the Trail-Making Test and Physiological Profile Assessment ($p < .05$) and had an increased risk of falls during the 12-month follow-up (relative risk = 1.63, 95% confidence interval 1.11-2.40). The association between WMHs and falls was little changed after

Abstracts Continued

Recent abstracts from the research literature

adjusting for Trail-Making Test and Physiological Profile Assessment scores, age, sex, education, and a range of cardiovascular risk factors (relative risk = 1.55, 95% confidence interval 1.06-2.26).

CONCLUSIONS: Greater WMH burden predicts falls over 12 months, and the association between greater burden of WMHs and falls appears to be independent of reduced executive function and sensorimotor performance. Strategies to reduce the development and progression of WMHs may contribute to future falls prevention in older people.

Sarcopenia as a risk factor for falls in elderly individuals: Results from the ilSIRENTE study.

Landi F, Liperoti R, Russo A, Giovannini S, Tosato M, Capoluongo E, Bernabei R, Onder G.

Clin. Nutr. 2012; ePub(ePub): ePub. Affiliation: Department of Gerontology and Geriatrics, Catholic University of Sacred Heart, Roma, Italy. DOI: 10.1016/j.clnu.2012.02.007 PMID: 22414775 (Copyright © 2012, Elsevier).

Abstract

BACKGROUND & AIMS: Sarcopenia has been indicated as a reliable marker of frailty and poor prognosis among the oldest individuals. We evaluated the relationship between sarcopenia and 2-year risk of falls in a population of persons aged 80 years or older.

METHODS: Data are from the baseline and follow-up evaluations of the Aging and Longevity Study in the Sirente Geographic Area (ilSIRENTE Study) (n=260). According to the European Working Group on Sarcopenia in Older People (EWGSOP), sarcopenia was diagnosed in presence of low muscle mass (mid-arm muscle circumference) plus either low muscle strength (hand grip) or low physical performance (4-m walking speed). The primary outcome measure was the incident falls during the follow-up period of 2 years. The relationship between sarcopenia and incident falls was estimated by deriving hazard ratios (HRs) from multiple logistic regression models considering the dependent variable of interest at least one fall during the follow-up period.

RESULTS: Sixty-six participants (25.4%) were identified as affected by sarcopenia. Eighteen out of 66 (27.3%) participants with sarcopenia and 19 out of 194 (9.8%) without sarcopenia reported incident falls during the two-year follow-up of the study ($p<0.001$). After adjusting for age, gender, cognitive mpairment, ADL impairment, sensory impairments, BMI, depression, physical activity, cholesterol, stroke, diabetes, number of medications, and C-reactive protein, participants with sarcopenia had a higher risk of incident falls compared with non sarcopenic subjects (adjusted hazard ratio [HR], 3.23; 95% confidence interval [CI], 1.25-8.29).

CONCLUSIONS: The present study suggests that sarcopenia - assessed using the EWGSOP algorithm - is highly prevalent among elderly persons without gender differences (25%). Sarcopenic participants were over three times more likely to fall during a follow-up period of 2 years relative to non sarcopenic individuals, regardless of age, gender and other confounding factors.

Falls in older people receiving in-home informal care across Victoria: Influence on care recipients and caregivers.

Meyer C, Dow B, Bilney BE, Moore KJ, Bingham AL, Hill KD.

Australas. J. Ageing 2012; 31(1): 6-12. Affiliation: National Ageing Research Institute, Parkville, Victoria, Australia. DOI: 10.1111/j.1741-6612.2010.00484.x PMID: 22417147 (Copyright © 2012, John Wiley and Sons).

Abstract

AIM: Older people receiving informal care at home appear at high falls risk. This study investigates frequency, circumstances and factors associated with falls risk for older care recipients, and their informal caregivers.

METHODS: Ninety-six dyads, recruited from caregiver agencies, underwent a home assessment, including falls risk, function, depression, quality of life, self-rated health and carer burden.

RESULTS: Care recipients were at high falls risk. In the past 12 months, 58% had fallen and 26% twice or more. Common falls risk factors were polypharmacy, multiple medical conditions and requiring functional assistance. Caregivers exhibited multiple health problems, moderate burden and reduced quality of life. Where care recipients had high falls risk, caregivers had significantly higher carer burden and depression. Low functional level and high care recipient health problems were independently associated with risk of falling ($P < 0.05$).

CONCLUSION: Strategies to reduce falls risk in this cohort are necessary, together with supporting the needs of the caregiver.

Risk Factors of Falls in Community-Dwelling Older Adults: Logistic Regression Tree Analysis.

Yamashita T, Noe DA, Bailer AJ.

Gerontologist 2012; ePub(ePub): ePub. Affiliation: Scripps Gerontology Center, Miami University, Oxford, OH 45056. yamasht@muohio.edu. DOI: 10.1093/geront/gns043 PMID: 22437329 (Copyright © 2012, Gerontological Society of America).

Abstract

Purpose of the Study: A novel logistic regression tree-based method was applied to identify fall risk factors and possible interaction effects of those risk factors.

DESIGN AND METHODS: A nationally representative sample of American older adults aged 65 years and older (N = 9,592) in the Health and Retirement Study 2004 and 2006 modules was used. Logistic Tree with Unbiased Selection, a computer algorithm for tree-based modeling, recursively split the entire group in the data set into mutually exclusive subgroups and fit a logistic regression model in each subgroup to generate an easily interpreted tree diagram.

RESULTS: A subgroup of older adults with a fall history and either no activities of daily living (ADL) limitation and at least one instrumental activity of daily living or at least one ADL limitation was classified as at high risk of falling. Additionally, within each identified subgroup, the best predictor of falls varied over subgroups and was also evaluated.

IMPLICATIONS: Application of tree-based methods may provide useful information for intervention program design and resource allocation planning targeting subpopulations of older adults at risk of falls.

Medications prescribed and occurrence of falls in general medicine inpatients.

Cashin RP, Yang M.

Can. J. Hosp. Pharm. 2011; 64(5): 321-326. Affiliation: Pharmacy Services, Alberta Health Services, Red Deer, Alberta. DOI: unavailable PMID: 22479083 (Copyright © 2011, Canadian Society of Hospital Pharmacists).

Abstract

BACKGROUND: Although falls are multifactorial, medications are a key risk factor that may be modifiable. Falls were among the most common occurrences entered into a risk identification system at the authors' hospital.

OBJECTIVES: To identify whether general medicine inpatients who had experienced a fall were taking any medications known to be associated with falls.

METHODS: The literature was reviewed to develop a list of high-risk medications that have been associated with falls. In a retrospective quality-improvement database-based study, information from the risk identification system was merged with data from the pharmacy dispensing system for general medicine inpatients who had experienced a fall. The primary end point was the percentage of patients with a documented fall who had a prescription for a high-risk medication. The number of such medications that had been prescribed for patients who fell was also calculated.

Abstracts Continued

Recent abstracts from the research literature

RESULTS: Eighty-one unique medications were found to be associated with falls. During the study period (April 1, 2008, to March 31, 2009), 151 patients experienced a fall. Of those, 144 (95.4%) were taking at least one high-risk medication. The mean number of high-risk medications per patient who experienced a fall was 2.2. Of all documented falls, a new high-risk medication had been started within 7 days before the fall for 74 (49.0%) and within 24 h before the fall for 17 (11.3%). The most commonly prescribed drugs during all time periods (i.e., within 24 h or 7 days before the fall or since the patient's admission) were lorazepam and zopiclone. The pharmacy database did not track administration of medications, so it is possible that some of the drugs prescribed were not actually taken by the patient.

CONCLUSION: Almost all inpatients who experienced a fall during the hospital stay had a prescription for at least one medication associated with a high risk for falls. Lorazepam and zopiclone were the drugs most commonly associated with falls in this hospital, and their use should be reviewed.

Dose-response relationship between selective serotonin re-uptake inhibitors and injurious falls: a study in nursing home residents with dementia.

Sterke CS, Ziere G, van Beeck EF, Looman CW, van der Cammen TJ.

Br. J. Clin. Pharmacol. 2012; 73(5): 812-820. Affiliation: Section of Geriatric Medicine, Department of Internal Medicine, Erasmus University Medical Center De StromenOpmaatGroep, Nursing Home Smeetsland Department of Public Health, Erasmus University Medical Center, Rotterdam, the Netherlands. DOI: 10.1111/j.1365-2125.2011.04124.x PMID: 22486601 (Copyright © 2012, John Wiley and Sons).

Abstract

WHAT IS ALREADY KNOWN ABOUT THIS SUBJECT: Patients treated with selective serotonin re-uptake inhibitors (SSRIs) have been shown to have an increased risk of falling. In nursing homes, many patients with dementia are given SSRIs as a treatment for depression. In this group, however, the possible risk of injurious falls by treatment dosage is not known.

WHAT THIS STUDY ADDS: Even at low doses, SSRIs are associated with increased risk of an injurious fall in nursing home residents with dementia. The risk increases with higher doses, with a three-fold increased risk at 1.00 Defined Daily Dose. The combination of a SSRI with a hypnotic or sedative increases the risk even further.

AIM: The contribution of selective serotonin re-uptake inhibitors (SSRIs) to injurious fall risk in patients with dementia has not been quantified precisely until now. Our objective was to determine whether a dose-response relationship exists for the use of SSRIs and injurious falls in a population of nursing home residents with dementia.

METHODS: Daily drug use and daily falls were recorded in 248 nursing home residents with dementia from 1 January 2006 until 1 January 2008. For each resident and for each day of the study period, data on drug use were abstracted from the prescription database, and information on falls and subsequent injuries was retrieved from a standardized incident report system, resulting in a dataset of 85 074 person-days.

RESULTS: We found a significant dose-response relationship between injurious falls and the use of SSRIs. The risk of an injurious fall increased significantly with 31% at 0.25 of the Defined Daily Dose (DDD) of a SSRI, 73% at 0.50 DDD, and 198% at 1.00 DDD (Hazard ratio = 2.98; 95% confidence interval 1.94, 4.57). The risk increased further in combination with a hypnotic or sedative.

CONCLUSIONS: Even at low doses, SSRIs are associated with increased risk of an injurious fall in nursing home residents with dementia. Higher doses increase the risk further with a three-fold risk at 1.00 DDD. New treatment protocols might be needed that take into account the dose-response relationship between SSRIs and injurious falls.

One-year mortality among elderly people after hospitalization due to fall-related fractures: comparison with a control group of matched elderly.

Coutinho ES, Bloch KV, Coeli CM.

Cad. Saude Publica 2012; 28(4): 801-805. Affiliation: Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz, Rio de Janeiro, Brasil. DOI: unavailable PMID: 22488325 (Copyright © 2012, Escola Nacional De Saude Publica).

Abstract

Fall-related fractures among the elderly represent an important public health problem. Severe fractures have been related to increased risk of death. In order to investigate the mortality profile of elderly individuals with severe fractures, 250 patients aged 60 years and over, hospitalized due to fall-related fractures and 250 elderly without fractures living in the local community were followed-up for one year. They were matched according to sex, age, time of hospitalization and neighborhood. Deaths were identified using probabilistic linkage of the research dataset and the local mortality registry. The one-year cumulative mortality was 25.2% in the case of individuals with severe fractures and 4% for those individuals without. The mortality distribution was not homogeneous across the follow-up period. Two-thirds of deaths among the elderly individuals hospitalized due to fracture occurred within the first 3 months, whereas mortality among those individuals without fractures took place later. Heart disease, pneumonia, GI bleeding, sepsis, and pulmonary embolism, diabetes and stroke were important causes of one-year mortality.

Vitamin D status in relation to postural stability in the elderly.

Boersma D, Demontiero O, Mohtasham Amiri Z, Hassan S, Suárez H, Geisinger D, Suriyaarachchi P, Sharma A, Duque G.

J. Nutr. Health Aging 2012; 16(3): 270-275. Affiliation: G. Duque, Ageing Bone Research Program, Sydney Medical School Nepean, The University of Sydney, PO Box 63 Penrith NSW 2751, Australia, Tel: +61 2 4734 4278; Facsimile: +61 2 4734 2614, Email: gustavo.duque@sydney.edu.au. DOI: unavailable PMID: 22456785 (Copyright © 2012, Springer).

Abstract

OBJECTIVES: Postural instability (PI) is an important risk factor for falls, especially in the frail older population. In this study, we investigated the impact of vitamin D deficiency on PI in a sample of community dwelling older subjects. Our objective was to determine the potential association between vitamin D deficiency and PI in older fallers.

DESIGN: Cross-sectional study.

SETTING: Falls and Fractures Clinic, Department of Geriatric Medicine, Nepean Hospital, Penrith, Australia.

PARTICIPANTS: One hundred and forty-five adults aged 65 years and older who have had at least one episode of a fall within the six months prior to assessment at the Falls and Fractures Clinic.

MEASUREMENTS: Serum 25(OH) vitamin D3 [25(OH)D3] and parathyroid hormone concentrations were determined at baseline. Subjects were separated into 3 groups based on serum 25(OH)D3 levels with the following cut-off values: < 30 nmol/L (deficient), 30-50 nmol/L (insufficient) and > 50 nmol/L (normal). Other baseline measurements included body mass index, mini-nutritional assessment, grip strength, serum calcium concentration and creatinine clearance, which were used as covariables. PI was assessed using a computerized virtual reality system (Medicaa, Uruguay). Measured parameters included limits of stability (LOS) and centre of pressure (COP) under eyes closed on foam (ECF) and visio-vestibular stimulation. The estimated swaying area, computed from the ellipse of confidence under eyes closed standing on foam (ECF), was also used as a PI parameter. Gait velocity (GV) was measured using a GaitRITE walkway system.

Abstracts Continued

Recent abstracts from the research literature

RESULTS: Posture was impaired in vitamin D deficiency (<30 nmol/L) as indicated by lower LOS (90 +/- 18), higher ECF (25 +/- 10) and slower GV (55 +/- 7) as compared with the insufficient and normal groups. After adjustment for demographic, biochemical and anthropometric variables, vitamin D deficiency significantly correlated with low LOS and high COP under ECF.

CONCLUSION: Low levels of vitamin D were associated with PI. This association could also have an effect on slow GV and increased risk of falls. In conclusion, using an objective method to measure balance in older fallers we have identified a novel role of vitamin D in balance control. Prospective studies are required to confirm the effect of vitamin D on PI and elucidate the mechanisms of this association.

Fear of Falling

Fear of Falling and Its Relationship With Anxiety, Depression, and Activity Engagement Among Community-Dwelling Older Adults.

Painter JA, Allison L, Dhingra P, Daughtery J, Cogdill K, Trujillo LG.

Am. J. Occup. Ther. 2012; 66(2): 169-176. Affiliation: Jane A. Painter, EdD, OTR/L, FAOTA, is Professor and Academic Fieldwork Coordinator, Occupational Therapy Department, College of Allied Health Sciences, East Carolina University, 3305 F Health Sciences Building, Greenville, NC 27858; painterj@ecu.edu. DOI: 10.5014/ajot.2012.002535 PMID: 22394526 (Copyright © 2012, American Occupational Therapy Association).

Abstract

OBJECTIVE: This study examined (1) the relationship of fear of falling to depression, anxiety, activity level, and activity restriction and (2) whether depression or anxiety predicted fear of falling, activity level, activity restriction, or changes in activity level.

METHOD: We administered the Survey of Activities and Fear of Falling in the Elderly; the Geriatric Depression Scale-30; and the Hamilton Anxiety Scale, IVR Version, during a one-time visit to 99 community-dwelling adults ≥55 yr old.

RESULTS: We found significant relationships between (1) fear of falling and depression, anxiety, and activity level; (2) depression and anxiety; and (3) activity restriction and depression. Activity level was negatively correlated with activity restriction, fear of falling, depression, and anxiety. Anxiety predicted both fear of falling and activity level. Both anxiety and depression predicted activity restriction because of fear of falling and for other reasons.

CONCLUSION: Occupational therapy practitioners should consider screening their older adult clientele for fear of falling, anxiety, and depression because these states may lead to fall risk and activity restriction.

Fear of Falling and Visual Field Loss from Glaucoma.

Ramulu PY, Landingham SW, Massof RW, Chan ES, Ferrucci L, Friedman DS.

Ophthalmology 2012; ePub(ePub): ePub. Affiliation: Wilmer Eye Institute, Johns Hopkins University, Baltimore, Maryland. DOI: 10.1016/j.ophtha.2012.01.037 PMID: 22480738 (Copyright © 2012, Elsevier Publishing).

Abstract

OBJECTIVE: To determine if visual field (VF) loss resulting from glaucoma is associated with greater fear of falling. DESIGN: Prospective, observational study.

PARTICIPANTS: Fear of falling was compared between 83 glaucoma subjects with bilateral VF loss and 60 control subjects with good visual acuity and without significant VF loss recruited from patients followed up for suspicion of glaucoma. METHODS: Participants completed the University of Illinois at Chicago Fear of Falling Questionnaire. The extent of fear of falling was assessed using Rasch analysis.

MAIN OUTCOME MEASURES: Subject ability to perform tasks without fear of falling was expressed in

logits, with lower scores implying less ability and greater fear of falling.

RESULTS: Glaucoma subjects had greater VF loss than control subjects (median better-eye mean deviation [MD] of -8.0 decibels [dB] vs. +0.2 dB; P<0.001), but did not differ with regard to age, race, gender, employment status, the presence of other adults in the home, body mass index (BMI), grip strength, cognitive ability, mood, or comorbid illness (P≥0.1 for all). In multivariate models, glaucoma subjects reported greater fear of falling as compared with controls (= -1.20 logits; 95% confidence interval [CI], -1.87 to -0.53; P = 0.001), and fear of falling increased with greater VF loss severity (= -0.52 logits per 5-dB decrement in the better eye VF MD; 95% CI, -0.72 to -0.33; P<0.001). Other variables predicting greater fear of falling included female gender (= -0.55 logits; 95% CI, -1.03 to -0.06; P = 0.03), higher BMI (= -0.07 logits per 1-unit increase in BMI; 95% CI, -0.13 to -0.01; P = 0.02), living with another adult (= -1.16 logits; 95% CI, -0.34 to -1.99 logits; P = 0.006), and greater comorbid illness (= -0.53 logits/1 additional illness; 95% CI, -0.74 to -0.32; P<0.001).

CONCLUSIONS: Bilateral VF loss resulting from glaucoma is associated with greater fear of falling, with an impact that exceeds numerous other risk factors. Given the physical and psychological repercussions associated with fear of falling, significant quality-of-life improvements may be achievable in patients with VF loss by screening for, and developing interventions to minimize, fear of falling.

Risk Assessment

WiiFit™ Plus balance test scores for the assessment of balance and mobility in older adults.

Reed-Jones RJ, Dorgo S, Hitchings MK, Bader JO.

Gait Posture 2012; ePub(ePub): ePub. Affiliation: Department of Kinesiology, College of Health Sciences, The University of Texas at El Paso, United States; Physical Therapy Program, Department of Rehabilitation Sciences, College of Health Sciences, The University of Texas at El Paso, United States. DOI: 10.1016/j.gaitpost.2012.03.027 PMID: 22534562 (Copyright © 2012, Elsevier Publishing).

Abstract

The Nintendo Wii™ is becoming an increasingly popular technology for the training and assessment of balance in older adults. Recent studies have shown promising results for its use in fall prevention. However, it is not clear how scores on the WiiFit™ balance games relate to current standardized tests of balance and mobility. The purpose of this study was to evaluate the relationship between WiiFit™ Plus balance tests, and standardized tests of older adult fitness, balance, mobility, self-reported balance confidence, and visual attention and processing. Results from 34 older adult participants indicate that WiiFit™ balance tests do not correlate well with standardized functional balance, mobility and fitness tests. However, the Wii balance score, as measured by the Basic Balance Test of the WiiFit™, does correlate with visual processing speed as measured by the Useful Field of View (UFOV(®)) test. These results indicate that WiiFit™ balance tests may provide advantageous information supplementary to information obtained through standard functional mobility and balance tests; however, caution should be used when using the WiiFit™ balance tests in isolation. Further research is necessary as these technologies become widely used in clinical and home settings for balance training and assessment.

Feasibility of Interdisciplinary Community-Based Fall Risk Screening.

Elliott SJ, Ivanescu A, Leland NE, Fogo J, Painter JA, Trujillo LG.

Am. J. Occup. Ther. 2012; 66(2): 161-168. Affiliation: Sharon J. Elliott, DHS, GCG, OTR/L, BCG, FAOTA, is Adult Therapy Services Coordinator, Therapeutic Life Center, PO Box 2163, Greenville, NC 27836; sjelliottotr@embarqmail.com. DOI: 10.5014/ajot.2012.002444 PMID: 22394525 (Copyright © 2012, American Occupational Therapy Association).

Abstract

OBJECTIVE: This pilot study examined the feasibility of (1) conducting interdisciplinary fall risk screens at a communitywide adult fall prevention event and (2) collecting preliminary follow-up data from people screened at the event about balance confidence and home and activity modifications made after

Abstracts Continued

Recent abstracts from the research literature

receiving educational information at the event.

METHOD: We conducted a pilot study with pre- and post testing (4-mo follow-up) with 35 community-dwelling adults ≥55 yr old.

RESULTS: Approximately half the participants were at risk for falls. Most participants who anticipated making environmental or activity changes to reduce fall risk initiated changes (n = 8/11; 72.7%) during the 4-mo follow-up period. We found no significant difference in participants' balance confidence between baseline (median = 62.81) and follow-up (median = 64.06) as measured by the Activities-specific Balance Confidence scale.

CONCLUSION: Conducting interdisciplinary fall risk screens at an adult fall prevention event is feasible and can facilitate environmental and behavior changes to reduce fall risk.

Intervention Studies

Occupational Therapy in Fall Prevention: Current Evidence and Future Directions.

Leland NE, Elliott SJ, O'Malley L, Murphy SL.

Am. J. Occup. Ther. 2012; 66(2): 149-160. Affiliation: Natalie E. Leland, PhD, OTR/L, BCG, is Assistant Professor, Division of Occupational Science and Occupational Therapy, Herman Ostrow School of Dentistry, and Davis School of Gerontology, University of Southern California, 1540 Alcazar Street, CHP 133, Los Angeles, CA 90089-9003; nleland@usc.edu. DOI: 10.5014/ajot.2012.002733 PMID: 22394524 (Copyright © 2012, American Occupational Therapy Association).

Abstract

Falls are a serious public health concern among older adults in the United States. Although many fall prevention recommendations exist, such as those published by the American Geriatrics Society (AGS) and the British Geriatrics Society (BGS) in 2010, the specific role of occupational therapy in these efforts is unclear. This article presents a scoping review of current published research documenting the role of occupational therapy in fall prevention interventions among community-dwelling older adults, structured by the AGS and BGS guidelines. We identified evidence for occupational therapy practitioner involvement in fall prevention in environmental modifications, exercise, and multifactorial and multicomponent interventions. Although research documenting the efficacy of occupational therapy interventions is identified as part of the Occupational Therapy Practice Framework: Domain and Process (2nd ed.; American Occupational Therapy Association, 2008), we identified little or no such research examining interventions to modify behaviors (e.g., fear of falling), manage postural hypotension, recommend appropriate footwear, and manage medications. Although occupational therapy is represented in the fall prevention research, the evidence for the profession's role in many areas is still lacking.

Building a sustainable academic-community partnership: Focus on fall prevention.

Gray B, Macrae N.

Work 2012; 41(3): 261-267. Affiliation: School of Social Work and Occupational Therapy Department, University of New England, Portland, ME, USA. DOI: 10.3233/WOR-2012-1294 PMID: 22398494 (Copyright © 2012, IOS Press).

Abstract

OBJECTIVE: To create an interprofessional/interdisciplinary education (IPE), pilot course that provided a representative group of students the opportunity to develop a 6 week fall reduction program for a group of elder volunteers who were independently living in the community. The authors describe the processes that occurred for the course and student-led program to be developed

RESULTS: This pilot course provided opportunities for interprofessional student learning, faculty practice and development, and a program to improve the health of the participants. Sustaining interprofessional collaboration is challenging, primarily due to scheduling difficulties and faculty workloads.

CONCLUSIONS: More time needs to be devoted to developing the team skills of students, as well as

building their knowledge of the contributions each discipline can make to a holistic view of elders. The next phase of this project needs to include pre and post measurement of students' readiness for IPE and elders to more adequately assess the components and effects of the course and program for fall prevention.

A pilot study comparing changes in postural control following training using a video game balance board program and two standard activity-based balance intervention programs.

Pluchino A, Lee SY, Asfour S, Roos BA, Signorile JF.

Arch. Phys. Med. Rehabil. 2012; ePub(ePub): ePub. Affiliation: University of Miami, Department of Kinesiology and Sport Sciences, Coral Gables, FL. DOI: 10.1016/j.apmr.2012.01.023 PMID: 22414490

Abstract

OBJECTIVE: To compare the impacts of Tai Chi, a standard balance exercise program [SBEP] and video game balance board program on postural control and perceived falls risk.

DESIGN: Randomized control trial.

SETTING: Research laboratory.

PARTICIPANTS: Forty independent seniors (72.10 ± 7.80) began the training, 27 completed.
INTERVENTIONS: Tai Chi, a standard balance exercise program and a video game balance board program.

MAIN OUTCOME MEASURE: Timed up-and-go (TUG), one-leg stand (OLS), functional reach (FR), Tinetti Performance Oriented Mobility Assessment (POMA), force plate center of pressure (COP) and time-to-boundary (TTB), dynamic posturography (DP), Falls Risk for Older People-Community Setting (FROP-Com) and Falls Efficacy Scale (FES).

RESULTS: No significant differences were seen between groups for any outcome measures at baseline, nor were significant time or group x time differences for any field test or questionnaire. No group x time differences were seen for any COP measures; however, significant time differences were seen for total COP, three of four anterior/posterior displacement and both velocity, and one displacement and one velocity medial/lateral measure across time for the entire sample. For DP, significant improvements in the overall score (DMA), and in two of the three linear and angular measures were seen for the sample.

CONCLUSIONS: The video game balance board program, which can be performed at home, was as effective as Tai Chi and SBEP in improving postural control and balance dictated by the force plate postural sway and DP measures. This finding may have implications for exercise adherence since the at-home nature of the intervention eliminates many obstacles to exercise training.

Effect of a Fall Prevention Program on Balance Maintenance Using a Quasi-experimental Design in Real-World Settings.

Robitaille Y, Fournier M, Laforest S, Gauvin L, Filiatrault J, Corriveau H.

J. Aging Health 2012; ePub(ePub): ePub. DOI: 10.1177/0898264312436713 PMID: 22422760

Abstract

OBJECTIVE: To examine the effect of a fall prevention program offered under real-world conditions on balance maintenance several months after the program. To explore the program's impact on falls.

METHOD: A quasi-experimental study was conducted among community-dwelling seniors, with pre- and postintervention measures of balance performance and self-reported falls. Ten community-based organizations offered the intervention (98 participants) and 7 recruited participants to the study's control arm (102 participants). An earlier study examined balance immediately after the 12-week program. The present study focuses on the 12-month effect. Linear regression (balance) and negative binomial regression (falls) procedures were performed.

RESULTS: During the 12-month study period, experimental participants improved and maintained their

Abstracts Continued

Recent abstracts from the research literature

balance as reflected by their scores on three performance tests. There was no evidence of an effect on falls.

DISCUSSION: Structured group exercise programs offered in community-based settings can maintain selected components of balance for several months after the program's end.

Effect of tai chi on body balance: randomized controlled trial in elderly men with dizziness.

Maciaszek J, Osinski W.

Am. J. Chin. Med. 2012; 40(2): 245-253. Affiliation: Department of Theory of Physical Education and Anthropomotorics, University School of Physical Education in Poznań, Poznań, Poland. jmaciaszek@awf.poznan.pl. DOI: unavailable PMID: 22419420 (Copyright © 2012, World Scientific Publishing).

Abstract

The purpose of this study was to assess the effect of 18-week Tai Chi training on body balance in a dynamic trial among elderly men with dizziness. The study covered subjects aged 60 to 80 years. We identified 40 men who reported a history of dizziness. The subjects were recruited using direct mailings and a community information campaign. The participants were randomly assigned to either the exercise intervention (n = 20) or control group (n = 20). The Tai Chi group participated in an 18-week exercise class held for 45 minutes twice a week. Body balance was studied in two ways: using the "8 foot up and go test" (Rikli and Jones 2001) and using a Computer Posturographic System PE 90 (manufactured by Military Institute of Aviation Medicine in Warsaw and outfitted with Pro-Med modified software). The ability to perform specific tasks (maximal deflections in four directions) was measured on the posturographic platform. The variation in results obtained on the first and second date of tests in the experimental and control groups was confirmed statistically using four parameters, i.e. "8 foot up to and go test (H = 8.21;p = 0.003), forward deflection (H = 3.70;p = 0.050), backward deflection (H = 5.04;p = 0.024) and maximum sway area (H = 8.86;p = 0.002). Consequently, we found that the 18-week period of Tai-Chi exercises, with a frequency of twice a week for 45 minutes, is beneficial for dynamic balance, which is important for the reduction of fall risk factors among elderly men with dizziness.

Study protocol for prevention of falls: A randomized controlled trial of effects of vitamin D and exercise on falls prevention.

Uusi-Rasi K, Kannus P, Karinkanta S, Pasanen M, Patil R, Lamberg-Allardt C, Sievänen H.

BMC Geriatr. 2012; 12(1): 12. DOI: 10.1186/1471-2318-12-12 PMID: 22448872 (Copyright © 2012, BioMed Central).

Abstract

BACKGROUND: Falls are the leading cause of unintentional injury and injury-related death among older people. In addition to physical activity, vitamin D also may affect balance and neuromuscular function. Low serum 25-hydroksivitamin D level increases the risk of bone loss, falls and fractures. Thus, an appropriate exercise program and sufficient vitamin D intake may significantly improve not only functional balance, but also balance confidence. Balance represents a complex motor skill determined by reaction time, muscle strength, and speed and coordination of movement.

METHODS: A 2-year randomized double-blind placebo-controlled vitamin D and open exercise trial of 409 home-dwelling women 70 to 80 years of age comprising four study arms: 1) exercise + vitamin D (800 IU/d), 2) exercise + placebo, 3) no exercise + vitamin D (800 IU/d), 4) no exercise + placebo. In addition to monthly fall diaries, general health status, life style, bone health, physical functioning, and vitamin D metabolism will be assessed. The primary outcomes are the rate of falls and fall-related injuries. Secondary outcomes include changes in neuromuscular functioning (e.g. body balance, muscle strength), ADL- and mobility functions, bone density and structure, cardiovascular risk factors, quality of life and fear of falling.

DISCUSSION: The successful completion of this trial will provide evidence on the effectiveness of exercise and vitamin D for falls reduction. Trial Registration ClinicalTrial.gov -register (NCT00986466).

The quality of English-language websites offering falls-prevention advice to older members of the public and their families.

Whitehead SH, Nyman SR, Broaders F, Skelton DA, Todd CJ.

Health Informatics J. 2012; 18(1): 50-65. Affiliation: Cardiff University, UK. DOI: 10.1177/1460458211432588 PMID: 22447877 (Copyright © 2012, Sage Publications.

Abstract

Falls among older people are a major public health issue. Increasing numbers of older people are accessing the internet for health-related information, including information on falls risk and prevention. However, we are aware of no study that has assessed the quality of such websites. Using techniques for conducting systematic literature reviews, we evaluated English-language websites offering falls-related advice to members of the public. Forty-two websites were identified using popular search engines; these were assessed using evidence-based guidelines and codes of conduct on coverage of falls-related information, credibility and senior friendliness. Overall, scores were poor for coverage of falls information and credibility, although they were higher for senior friendliness. Few of the websites had been recently updated and none provided individually-tailored advice. We conclude that websites have fallen short of their potential to provide accessible, evidence-based information on the risks of falls and their prevention.

BEST at home: a pilot evaluation of a home-based strength and balance exercise program.

Bates A, Eccleston P, Kershaw M.

Health Promot. J. Austr. 2011; 22(3): 234-237. Affiliation: Health Promotion Service, Health Reform Transitional Organisation-Southern, NSW Health. amanda.bates@sesiahs.health.nsw.gov.au DOI: unavailable PMID: 22497070 (Copyright © 2011, Australian Health Promotion Association).

Abstract

ISSUE ADDRESSED: Home-based exercise with home visits has been shown to improve strength and balance and reduce falls in older people. This pilot study aimed to determine whether a home-based exercise program (delivered via workshops instead of home visits) improved strength and balance and reduced falls in adults aged 60 years and over.

METHODS: Participants attended two workshops over a six-month period and were instructed in the exercises by physiotherapists. Participants recorded their exercise and falls on a calendar and strength and balance measures were assessed at baseline and 12 weeks. Data was analysed using Wilcoxon signed rank tests, McNemar's test and regression.

RESULTS: A total of 167 participants commenced the BEST at home program. The mean age was 69 years and 67% were female. Participants significantly improved in all measures of strength and balance. The number of falls was reduced during the six-month period but statistical significance was not achieved.

CONCLUSIONS: The BEST at home program improved strength and balance in people aged 60 years and over. More research is required to determine long term adherence to BEST at home and whether this program can reduce falls.

Effects of a multi-factorial falls prevention program for people with stroke returning home after rehabilitation: a randomized controlled trial.

Batchelor FA, Hill KD, Mackintosh SF, Said CM, Whitehead CH.

Arch. Phys. Med. Rehabil. 2012; ePub(ePub): ePub. Affiliation: National Ageing Research Institute, Parkville, Victoria, Australia; School of Health Sciences, University of Melbourne, Parkville, Victoria, Australia. DOI: 10.1016/j.apmr.2012.03.031 PMID: 22503739 (Copyright © 2012, Elsevier Publishing)

Abstract

OBJECTIVES: To determine whether a multi-factorial falls prevention program reduces falls in people

Abstracts Continued

Recent abstracts from the research literature

with stroke at risk of recurrent falls, and to determine whether this program leads to improvements in gait, balance, strength and fall-related efficacy.

DESIGN: A single blind, multi-center, randomized controlled trial with 12 month follow-up. SETTING: Participants were recruited after discharge from rehabilitation and followed up in the community. PARTICIPANTS: Participants (N=156) were people with stroke at risk of recurrent falls being discharged home from rehabilitation.

INTERVENTIONS: Tailored multi-factorial falls prevention program and usual care, (N=71) or control (usual care, N=85).

MAIN OUTCOME MEASURES: Primary outcomes were rate of falls and proportion of fallers. Secondary outcomes included injurious falls, falls risk, participation, activity, leg strength, gait speed, balance, and falls efficacy.

RESULTS: There was no significant difference in fall rate (intervention 1.89 falls/person-year, control 1.76 falls/person-year, IRR=1.10, P=0.74) or proportion of fallers between the groups (RR=0.83, 95%CI 0.60 - 1.14). There was no significant difference in injurious fall rate (intervention 0.74 injurious falls/person-year, control 0.49 injurious falls/person-year, IRR=1.57, P=0.25), and there were no significant differences between groups on any other secondary outcome.

CONCLUSIONS: his multifactorial falls prevention program was not effective in reducing falls in people with stroke who are at risk of falls nor was it more effective than usual care in improving gait, balance and strength in people with stroke. Further research is required to identify effective interventions for this high risk group.

Evidence of detraining after 12-week home-based exercise programs designed to reduce fall risk factors in older people recently discharged from hospital.

Vogler CM, Menant JC, Sherrington C, Ogle SJ, Lord SR.

Arch. Phys. Med. Rehabil. 2012; ePub(ePub): ePub. Affiliation: Department of Aged Care and Rehabilitation, Royal North Shore Hospital, Sydney, Australia; Falls and Balance Research Group, Neuroscience Research Australia, University of New South Wales, Randwick, Sydney, Australia; Faculty of Medicine, University of Sydney, Australia. DOI: 10.1016/j.apmr.2012.03.033 PMID: 22504154 (Copyright © 2012, Elsevier Publishing).

Abstract

OBJECTIVE: To measure the extent to which improved sensorimotor function and balance resulting from a 12-week exercise intervention were retained 12 weeks after exercise cessation in older adults recently discharged from hospital.

DESIGN: Randomized-controlled trial with reassessment 12 weeks post exercise cessation

SETTING: Home-based exercises

PARTICIPANTS: 180 adults aged 65 and older recently discharged from hospital (mean (±SD) length of stay: 12.3 ± 10.6 days)

INTERVENTIONS: Weight-Bearing (WB) exercises (n=60), Seated Resistance (SR) exercises (n=60) or social visits (n=60)

MAIN OUTCOME MEASURES: Physiological Profile Assessment (PPA), a composite sensorimotor fall risk score and two measures of controlled leaning balance assessed at baseline, immediately after the intervention (12 weeks, 95% assessed) and again 12 weeks later (24 weeks, 92% assessed) RESULTS: After the initial improvements in outcomes found at 12 weeks, both the SR and WB exercise groups showed detraining effects at 24 weeks. The PPA fall risk scores for both SR and WB groups returned to close to baseline values and there was no significant difference between groups at 24 weeks when controlling for baseline scores (p=0.924). WB exercise participants lost up to half of the improvement in the maximal balance range and coordinated stability tests. There was no difference between groups

for the maximal balance range test at 24 weeks when controlling for baseline scores (p= 0.207) but between-group differences were maintained for the coordinated stability test (p=0.017).

CONCLUSIONS: Balance improvements and fall risk reductions associated with a 12-week home-based exercise program in older adults were partially to totally lost 12 weeks after cessation of the intervention. These significant detraining effects suggest that sustained adherence to falls prevention exercise programs is required to reduce fall risk.

The effect of the Nintendo Wii Fit and exercise in improving balance and quality of life in community dwelling elders.

Franco JR, Jacobs K, Inzerillo C, Kluzik J.

Technol. Health Care 2012; 20(2): 95-115. Affiliation: Boston University, Haskell, NJ, USA. DOI: 10.3233/THC-2011-0661 PMID: 22508022 (Copyright © 2012, IOS Press).

Abstract

Introduction: This study compared the effect of Nintendo Wii Fit to the Matter of Balance program, a valid and reliable program, on improving balance, and well-being to decrease the risk of falls. Methods: Residents of an independent living senior housing facility were recruited and thirty-two residents ages 63 to 90 participated. Participants were separated into three groups: (1) Wii Fit group (n=11) completed balance games on the Wii Fit in individual sessions twice a week and supplemental home exercises; (2) Matter of Balance Group (n=11) completed exercises from the Matter of Balance Program in a group setting twice a week; (3) Control group (n=10) received no intervention. Intervention lasted three weeks.

Results/findings: One-way ANOVA's were completed. Scores from the assessments were not statistically significant at post-test Berg Balance Scale (p=0.837); Tinetti Gait and Balance Assessment (p=0.913); SF-36 (p=0.256). Results from a self-report demonstrated that Wii Fit is an enjoyable form of exercise for an elderly population.

Conclusion: Although, the interventions failed to significantly increase balance, with an increase in intervention duration of Wii Fit or Matter of Balance balance may be improved. Although results were not significant this study adds to the growing body of evidence regarding the use of Wii Fit as a rehabilitation tool.

Emerging concept: 'central benefit model' of exercise in falls prevention.

Liu-Ambrose T, Nagamatsu LS, Hsu CL, Bolandzadeh N.

Br. J. Sports Med. 2012; ePub(ePub): ePub. Affiliation: Department of Physical Therapy, University of British Columbia, Vancouver, BC, Canada. DOI: 10.1136/bjsports-2011-090725 PMID: 22522589 (Copyright © 2012, BMJ Publishing Group).

Abstract

Falls are a common geriatric syndrome and are the third leading cause of chonic disability worldwide. Falls are not random events and occur, at least in part, due to impaired physiological function, such as impaired balance, and cognitive impairment. The clinical syndrome of falls is important for Sports and Exercise Medicine Clinicians as there is Level 1 evidence that targeted exercise prescription is an effective intervention strategy. The widely accepted dogma is that improved physical function, balance and muscle strength, underlies the effectiveness of the exercise in reducing falls. However, findings from randomised controlled trials suggest that exercise reduce falls via mechanisms other than improved physiological function. The authors propose that improved cognitive function - specifically, executive functions - and associated functional plasticity may be an important yet underappreciated mechanism by which the exercise reduces falls in older adults.

Falls Network Information

fallsnetwork.neura.edu.au

Joining the Network

To join the NSW Falls Prevention Network listserv, send an email to:

majordomo@lists.health.nsw.gov.au

In the body of the message type

subscribe nsw-falls-network

on the next line type *end*

Do not put anything in the subject line. You will receive an e-mail to confirm you have been added to the listserv.

To unsubscribe send an e-mail to the above address and in the body of the message type

unsubscribe nsw-falls-network

on the next line type *end*

If you have any problems, contact Esther Vance at *e.vance@neura.edu.au*.

Share your news and information/ideas

Do you have any news on Falls Prevention you want to share with others on the network, or do you want to report on a project that is happening in your area.

Please email Esther with your information. We also welcome suggestions for articles and information you would like to see in this newsletter.

Send your information to:
e.vance@neura.edu.au

The Network Listserv

It is great to see the increased activity on the listserv and we want to continue to promote this. To send an item to the listserv where all members of the network can see it, send an email to:

nsw-falls-network@lists.health.nsw.gov.au

You need to be a subscriber to the listserv to send an email that will be distributed to all members of the on the listserv. Remember to put a short description in the subject line.

Recently some posts to the listserv have bounced due to email address changes, you need to re-subscribe with your new e-mail address and unsubscribe from your old address following the Join the Network instructions as shown on this page.

NSW Falls Prevention Network Background

The NSW Falls Prevention Network was established in 1993. The role of this network has grown since its inception and now includes:

- Meetings for discussion of falls related issues;
- Dissemination of research findings both local and international;
- Sharing resources developed and exploration of opportunities to combine resources in joint initiatives;
- Encouragement of collaborative projects and research;
- To act as a group to influence policy;
- To liaise with NSW Ministry of Health to provide information on current State/Commonwealth issues in relation to falls and
- Maintenance of resources pertinent to the field.

The main purpose of the network is to share knowledge, expertise and resources on falls prevention for older people.

The NSW Falls Prevention Network activities are part of the implementation of the NSW Falls Prevention Policy funded by the NSW Ministry of Health.

"Falls Prevention is Everyone's Business"

NSW FALLS PREVENTION NETWORK