

Safety Literature 12th January 2020

Are older people putting themselves at risk when using their walking frames?

Thies SB, Bates A, Costamagna E, Kenney L, Granat M, Webb J, Howard D, Baker R, Dawes H. BMC Geriatr. 2020; 20(1): e90.

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Abstract

BACKGROUND: Walking aids are issued to older adults to prevent falls, however, paradoxically their use has been identified as a risk factor for falling. To prevent falls, walking aids must be used in a stable manner, but it remains unknown to what extent associated clinical guidance is adhered to at home, and whether following guidance facilitates a stable walking pattern. It was the aim of this study to investigate adherence to guidance on walking frame use, and to quantify user stability whilst using walking frames. Additionally, we explored the views of users and healthcare professionals on walking aid use, and regarding the instrumented walking frames ('Smart Walkers') utilized in this study.

METHODS: This observational study used Smart Walkers and pressure-sensing insoles to investigate usage patterns of 17 older people in their home environment; corresponding video captured contextual information. Additionally, stability when following, or not, clinical guidance was quantified for a subset of users during walking in an Activities of Daily Living Flat and in a gait laboratory. Two focus groups (users, healthcare professionals) shared their experiences with walking aids and provided feedback on the Smart Walkers.

RESULTS: Incorrect use was observed for 16% of single support periods and for 29% of dual support periods, and was associated with environmental constraints and a specific frame design feature. Incorrect use was associated with reduced stability. Participants and healthcare professionals perceived the Smart Walker technology positively.

CONCLUSIONS: Clinical guidance cannot easily be adhered to and self-selected strategies reduce stability, hence are placing the user at risk. Current guidance needs to be improved to address environmental constraints whilst facilitating stable walking. The research is highly relevant considering the rising number of walking aid users, their increased falls-risk, and the costs of falls.

Language: en

Keywords

Falls; Older adults; Stability; Walking aids

Effect of eldecalsitol on muscle function and fall prevention in Japanese postmenopausal women: a randomized controlled trial

Saito T, Mori Y, Irei O, Baba K, Nakajo S, Itoi E. *J. Orthop. Sci.* 2020; ePub(ePub): ePub.

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DOI 10.1016/j.jos.2020.02.004 **PMID** 32139267

Abstract

BACKGROUND: Exercises and vitamin D interventions have shown to improve muscle function and balance, and prevent falls in postmenopausal healthy women and in patients with osteoporosis. However, the effects of eldecalsitol on these factors remain undetermined. The present open-label, randomized, controlled study aimed to investigate the effects of eldecalsitol treatment in reducing falls in postmenopausal women, and improving muscle function and balance.

METHODS: The study population included 226 Japanese postmenopausal women with osteoporosis. Patients were randomly divided into two groups on the basis of treatment with or without eldecalsitol (0.75 µg/day). Treatment continued for 6 months. Participants in both groups were instructed to perform back extensor muscle exercise. Isometric back extensor and leg extensor strength, grip power, ten-meter walking speed, timed up and go test and time of single leg standing were measured at baseline and 24 weeks. Patients were asked to record the number of falls during the 24-week period.

RESULTS: The percentage increase in average bilateral quadriceps muscle strength was significantly higher in the eldecalsitol group compared with the non-eldecalsitol group (right, $p = 0.041$; left, $p = 0.042$). In contrast, there were no significant differences in the strength of back muscles and grip power and the parameters of balance and walking abilities between the groups. There was no significant difference in the number of falls between the groups.

CONCLUSIONS: A 24-week intervention of eldecalsitol improves the strength of the quadriceps muscles in postmenopausal women with osteoporosis. However, eldecalsitol neither improve balance and walking abilities nor reduce the number of falls.

Language: en

Effects of video-game based therapy on balance, postural control, functionality, and quality of life of patients with subacute stroke: a randomized controlled trial

Cano-Mañas MJ, Collado-Vazquez S, Rodríguez Hernández J, Muñoz Villena AJ, Cano-de-la-Cuerda R. J. Healthc. Eng. 2020; 2020: e5480315.

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Abstract

PURPOSE: To determine the effects of a structured protocol using commercial video games on balance, postural control, functionality, quality of life, and level of motivation in patients with subacute stroke.

METHODS: A randomized controlled trial was conducted. A control group (n = 25) received eight weeks of conventional rehabilitation consisting of five weekly sessions based on an approach for task-oriented motor training. The experimental group (n = 25) received eight weeks of conventional rehabilitation consisting of five weekly sessions based on an approach for task-oriented motor training. The experimental group (.

RESULTS: In the between-group comparison, statistically significant differences were observed in the Modified Rankin scores (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (p < 0.01), the Barthel Index (.

CONCLUSION: A protocol of semi-immersive video-game based therapy, combined with conventional therapy, may be effective for improving balance, functionality, quality of life, and motivation in patients with subacute stroke. This trial is registered with NCT03528395.

Language: en

Perceived social isolation, social disconnectedness and falls: the mediating role of depression

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Abstract

Objectives: to estimate the association of social disconnectedness and perceived social isolation with the risk of falls and also investigate whether depression mediated this association. **Method:** Biennial longitudinal survey data from 2006 to 2012 waves of the U.S. Health and Retirement Study of adults aged 65 and older (N = 22,153 observations) were examined. The outcome variable was number of self-reported falls over the observation period. Independent variables included social isolation (social disconnectedness, perceived social isolation) and number of depressive symptoms. Generalized Estimating Equation regressions were performed to address the research questions. **Results:** Regression models indicated that social disconnectedness is associated with a 5% increase in the risk of falls. Perceived social isolation (lack of perceived social support and loneliness combined) was associated with a 33% increase in falls risk. For each increase in the number of depressive symptoms, the risk of falls increased by 13%. Also, the number of depressive symptoms mediated the association between perceived social isolation and risk of falls. **Conclusion:** Our findings were suggestive of the need to consider social isolation when designing falls prevention programs. More research is needed with research designs that address potential endogeneity bias.

Language: en

Keywords

Health and Retirement Study; Mental health; Loneliness; population-based study; social relationships

Reduced strength, poor balance and concern about falls mediate the relationship between knee pain and fall risk in older people

Hicks C, Levinger P, Menant JC, Lord SR, Sachdev PS, Brodaty H, Sturnieks DL. *BMC Geriatr.* 2020; 20(1): e94.

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Abstract

BACKGROUND: Pain is an independent risk factor for falling. One in two older community-dwelling people with musculoskeletal pain fall each year. This study examined physical, psychological and medical factors as potential mediators to explain the relationship between knee pain and falls.

METHODS: Three hundred and thirty-three community-dwelling people aged 70+ years (52% women) participated in this cohort study with a 1-year follow-up for falls. Participants completed questionnaires (medical history, general health and concern about falls) and underwent physical performance tests. Participants were classified into 'pain' and 'no pain' groups based on self-reported knee pain. Poisson Regression models were computed to determine the Relative Risk (RR) of having multiple falls and potential mediators for increased fall risk.

RESULTS: One hundred and eighteen (36%) participants were categorised as having knee pain. This group took more medications and had more medical conditions ($P < 0.01$) compared to the no pain group. The pain group had poorer balance, physical function and strength and reported increased concern about falls. Sixty one participants (20%) reported ≥ 2 falls, with the pain group twice as likely to experience multiple falls over the 12 month follow up (RR = 2.0, 95% confidence interval (CI) = 1.27-3.13). Concern about falls, knee extension torque and postural sway with eyes closed were identified as significant and independent mediators of fall risk, and when combined explained 23% of the relationship between knee pain and falls.

CONCLUSION: This study has identified several medical, medication, psychological, sensorimotor, balance and mobility factors to be associated with knee pain, and found the presence of knee pain doubles the risk of multiple falls in older community living people. Alleviating knee pain, as well as addressing associated risk factors may assist in preventing falls in older people with knee pain.

Language: en

Keywords

Accidental falls; Knee pain; Older adults, balance, fear of falling

Relevance of sex, age and gait kinematics when predicting fall-risk and mortality in older adults

Porta S, Martinez A, Millor N, Gomez M, Izquierdo M. J. Biomech. 2020; ePub(ePub): ePub.

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Abstract

Approximately one-third of elderly people fall each year with severe consequences, including death. The aim of this study was to identify the most relevant features to be considered to maximize the accuracy of a logistic regression model designed for prediction of fall/mortality risk among older people. This study included 261 adults, aged over 65 years. Men and women were analyzed separately because sex stratification was revealed as being essential for our purposes of feature ranking and selection. Participants completed a 3-m walk test at their own gait velocity. An inertial sensor attached to their lumbar spine was used to record acceleration data in the three spatial directions. Signal processing techniques allowed the extraction of 21 features representative of gait kinematics, to be used as predictors to train and test the model. Age and gait speed data were also considered as predictors. A set of 23 features was considered. These features demonstrate to be more or less relevant depending on the sex of the cohort under analysis and the classification label (risk of falls and mortality). In each case, the minimum size subset of relevant features is provided to show the maximum accuracy prediction capability. Gait speed has been largely used as the single feature for the prediction fall risk among older adults. Nevertheless, prediction accuracy can be substantially improved, reaching 70% in some cases, if the task of training and testing the model takes into account some other features, namely, sex, age and gait kinematic parameters. Therefore we recommend considering sex, age and step regularity to predict fall-risk.

Language: en

Keywords

Feature selection for maximum accuracy prediction; Logistic regression model; Prediction of falls/mortality risk; Sex stratification importance

The role of the podiatrist in assessing and reducing fall risk: an updated review

Rosenblatt NJ, Girgis C, Avalos M, Fleischer AE, Crews RT. Clin. Podiatr. Med. Surg. 2020; 37(2): 327-369.

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Abstract

Falls present a tremendous challenge to health care systems. This article reviews the literature from the previous 5 years (2014-2019) in terms of methods to assess fall risk and potential steps that can be taken to reduce fall risk for patients visiting podiatric clinics. With regard to assessing fall risk, we discuss the role of a thorough medical history and podiatric assessments of foot problems and deformities that can be performed in the clinic. With regard to fall prevention we consider the role of shoe modification, exercise, pain relief, surgical interventions, and referrals.

Language: en

Keywords

Balance; Falls; Older adults; Pain; Prevention; Shoe modification; Surgery

Use of a fall risk evaluation in a community-based pharmacy

Hughes KM, Witry MJ, Doucette WR, Veach SR, McDonough RP. *J. Am. Pharm. Assoc.* 2020; ePub(ePub): ePub.

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Abstract

BACKGROUND: Falls in older adults are a serious public health concern. They increase health care expenditure and account for more than \$30 billion in direct medical costs. Medication-related problems can contribute to fall risk, and community-based pharmacists are well positioned to intervene, given their role in monitoring ongoing medications.

OBJECTIVES: To evaluate the integration of a fall risk screening assessment (i.e., Stopping Elderly Accidents, Deaths, and Injuries [STEADI]) into community pharmacy practice and to report on the targeted medication management interventions that pharmacists made for patients aged 50 years or older with a fall risk potential. **PRACTICE DESCRIPTION:** A service-oriented independent pharmacy in the Midwest United States that uses an in-house clinical software program to perform a prospective drug utilization review and document clinical interventions. **PRACTICE INNOVATION:** A 3-item STEADI fall risk screening assessment was administered from October 15, 2018, to January 31, 2019, to 311 pharmacy patrons aged 50 years or older taking high-risk medications. **EVALUATION:** For those with a positive screen for fall risk, the 12-item STEADI fall risk assessment was administered. A pharmacist performed a comprehensive medication review (CMR) for these patients. Education and medication recommendations were provided.

RESULTS: Fifty-three patients (17%) responded "Yes" to at least 1 prescreening question. The mean total STEADI fall risk score was 5.7 out of 12. The most commonly reported STEADI item was a worry regarding falling (75.5%) and sometimes feeling unsteady when walking (67.9%). Education regarding falls was provided to all the patients who received the study CMR, but only 6 medication changes were made to the prescribers, of which 4 were accepted.

CONCLUSION: The STEADI assessment was useful in identifying patients who were potentially at a risk of falls. More work pertaining to deprescribing high-risk medications for at-risk patients seems to be needed.

Language: en

Intracranial hemorrhage in older adults: implications for fall risk assessment and prevention

Shih RD, Ouslander JG. *J. Am. Geriatr. Soc.* 2020; ePub(ePub): ePub.

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Abstract

This editorial comments on the article by Pedersen et al. and de Wit et al.

Every second, an older person in the United States falls; and every 20 minutes, one of them dies.¹ Falls are one of the leading causes of morbidity and mortality from injury in the older population. Approximately one in four Americans older than 65 years falls each year, accounting for approximately 27,000 deaths, 2.8 million emergency department (ED) visits, 800,000 hospitalizations yearly, and 50 billion dollars in medical costs.^{1, 2} Fall prevention can be successfully implemented on a population basis by encouraging healthcare providers to use evidence-based interventions.³ However, these efforts are often inadequate, and physicians need to do more to effectively use existing guidelines and tools to prevent these potentially devastating and costly events.⁴

Among the worst outcomes from a fall are traumatic brain injury (TBI) and intracranial hemorrhage (ICH). TBI in older patients is due to falls in 70% of cases and increases to 85% in patients older than 85 years. Mortality in older TBI patients is as high as 16%.^{5, 6} Moreover, TBI occurrence in older people has increased disproportionately compared to population growth.^{6, 7} Because an increasing number of older people are also being treated with anticoagulant medications for a variety of conditions, increased morbidity and mortality from ICH is a growing concern ...

Language: en

Prevalence and severity of traumatic intracranial hemorrhage in older adults with low-energy falls

Lampart A, Kuster T, Nickel CH, Bingisser R, Pedersen V. J. Am. Geriatr. Soc. 2020; ePub(ePub): ePub.

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Abstract

BACKGROUND/OBJECTIVES: To determine the prevalence and severity of traumatic intracranial hemorrhage (tICH) in a large cohort of older adults presenting with low-energy falls and the association with anticoagulation or antiplatelet medication.

DESIGN: Bicentric retrospective cohort analysis. **SETTING:** Two level 1 trauma centers in Switzerland and Germany. **PARTICIPANTS:** Consecutive sample of older adults (aged ≥ 65 y) presenting to the emergency department (ED) over a 1-year period with low-energy falls who received cranial computed tomography (cCT) within 48 hours of ED presentation. **MEASUREMENTS:** The prevalence and severity of tICHs was assessed and the outcomes (in-hospital mortality, admission to intensive care unit [ICU], or neurosurgical intervention) were specified. We used multivariate regression models to measure the association between anticoagulation/antiplatelet therapy and the risk for tICH after adjustment for known predictors.

RESULTS: The overall prevalence for tICH detected by cCT was 176 of 2567 (6.9%). Neurosurgical intervention was performed in 15 of 176 (8.5%) patients with tICH, 28 of 176 (15.9%) patients were admitted to the ICU, and 14 of 176 (8.0%) died in the hospital. CT-detected skull fracture and signs of injury above the clavicles were the strongest predictors for the presence of tICH (odds ratio [OR] = 4.28; 95% confidence interval [CI] = 2.79-6.51; OR = 1.88; 95% CI = 1.3-2.73, respectively). Among 2567 included patients, 1424 (55%) were on anticoagulation/antiplatelet therapy. Multivariate regression models showed no differences for the risk of tICH (OR = 1.05; 95% CI = .76-1.47; $P = .76$) or association with the head-specific Injury Severity Scale (incident rate ratio = 1.08; 95% CI = .97-1.19; $P = .15$) with or without anticoagulation/antiplatelet therapy.

CONCLUSION: Medication with anticoagulants or antiplatelet agents was not associated with higher prevalence and severity of tICH in older patients with low-energy falls undergoing cCT examination. In addition to cCT-detected skull fractures, visible injuries above the clavicles were the strongest clinical predictors for tICH. Our findings merit prospective validation.

Language: en

Keywords

anticoagulation therapy; antiplatelet therapy; injury severity; low-energy fall; traumatic intracranial haemorrhage

Prospective cohort study on the predictors of fall risk in 119 patients with bilateral vestibulopathy

Dobbels B, Lucieer F, Mertens G, Gilles A, Moyaert J, Van de Heyning P, Guinand N, Pérez Fornos A, Herssens N, Hallems A, Vereeck L, Vanderveken O, Van Rompaey V, van de Berg R. PLoS One 2020; 15(3): e0228768.

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Abstract

OBJECTIVES: To identify predictive factors for falls in patients with bilateral vestibulopathy (BV). Specific variables contributing to the general work-up of a vestibular patient were compared between BV patients experiencing falls and those who did not.

DESIGN: Prospective multi-centric cohort study. **SETTING:** Department of Otorhinolaryngology & Head and Neck Surgery at two tertiary referral centers: Antwerp University Hospital and Maastricht University Medical Center. **PARTICIPANTS:** In total, 119 BV patients were included. BV diagnosis was defined in accordance with the diagnostic BV criteria, established by the Bárány Society in 2017. **MAIN OUTCOME MEASURES:** Patients were divided into fallers and non-fallers, depending on the experience of one or more falls in the preceding 12 months. Residual vestibular function on caloric testing, rotatory chair testing, video head impulse test (vHIT) and cervical vestibular evoked myogenic potentials (cVEMP) was evaluated as a predictive factor for falls. Furthermore, hearing function (speech perception in noise (SPIN)), sound localization performance, etiology, disease duration, sport practice, scores on the Dizziness Handicap Inventory (DHI) and the Oscillopsia Severity Questionnaire (OSQ) were compared between fallers and non-fallers.

RESULTS: Forty-five (39%) patients reported falls. In a sub-analysis in the patients recruited at UZA (n = 69), 20% experienced three or more falls and three patients (4%) suffered from severe fall-related injuries. The DHI score and the OSQ score were significantly higher in fallers. Residual vestibular function, SPIN, sound localization performance, etiology, disease duration, age and sport practice did not differ between fallers and non-fallers.

CONCLUSIONS: Falls and (severe) fall-related injuries are frequent among BV patients. A DHI score > 47 and an OSQ score > 27.5 might be indicative for BV patients at risk for falls, with a sensitivity of 70% and specificity of 60%. Residual vestibular function captured by single vestibular tests (vHIT, calorics, rotatory chair, cVEMP) or by overall vestibular function defined as the number of impaired vestibular sensors are not suitable to distinguish fallers and non-fallers in a BV population.

Language: en