

Safety Literature 23rd February 2020

Association between fall history and performance-based physical function and postural sway in patients with rheumatoid arthritis

Kawabata K, Matsumoto T, Kasai T, Chang SH, Hirose J, Tanaka S. *Mod. Rheumatol.* 2020; ePub(ePub): ePub.

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Abstract

Objectives:

Patients with rheumatoid arthritis (RA) are at increased risk of falling; therefore, fall prevision and prevention are critical. The present study aimed to evaluate the ability of physical performance assessments to discriminate between RA patients with and without a history of falling.

Methods:

Fifty patients with RA were divided into two groups according to the presence or absence of a history of falls within the previous 1 year. Physical performance was assessed using the short physical performance battery (SPPB), which consists of the timed standing balance, gait speed, and chair stand tests. Standing balance was also assessed as postural sway using a force platform in several positions including standing with both feet together, semitandem, and tandem. Backgrounds, SPPB, and postural sway were compared between the two groups.

Results:

Fourteen patients (28%) reported one or more falls within the previous year. There were no significant intergroup differences in baseline characteristics or SPPB score. The group with a history of falls had significantly longer measured time for the 5-repetition chair stand test and significantly longer postural sway in the semitandem position. The discriminate analysis revealed that 5-repetition chair stand test or its combination with postural sway in the semitandem position significantly discriminated between fallers and non-fallers.

Conclusion:

Numerical evaluation of the chair stand test and postural sway in the semitandem position seems more appropriate than SPPB for assessing the fall risk of patients with RA.

Language: en

Keywords

Fall; Physical function; Postural sway; Rheumatoid arthritis; Short physical performance battery

Care transition decisions after a fall-related ED visit: a qualitative study of patients' and caregivers' experiences

Gettel CJ, Hayes K, Shield RR, Guthrie KM, Goldberg EM. Acad. Emerg. Med. 2020; ePub(ePub): ePub.

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Abstract

OBJECTIVE: Falls are a leading cause of injury-related emergency department (ED) visits and may serve as a sentinel event for older adults, leading to physical and psychological injury. Our primary objective was to characterize patient- and caregiver-specific perspectives about care transitions after a fall.

METHODS: Using a semi-structured interview guide, we conducted in-depth, qualitative interviews using grounded theory methodology. We included patients enrolled in the Geriatric Acute and Post-acute Fall Prevention Intervention (GAPcare) trial aged 65 years and older that had an ED visit for a fall and their caregivers. Patients with cognitive impairment (CI) were interviewed in patient-caregiver dyads. Domains assessed included the post-fall recovery period, the skilled nursing facility (SNF) placement decision-making process, and the ease of obtaining outpatient follow-up. Interviews were audio-recorded, transcribed verbatim, and coded and analyzed for a priori and emergent themes.

RESULTS: A total of 22 interviews were completed with 10 patients, eight caregivers, and four patient-caregiver dyads within the six-month period after initial ED visits. Patients were on average 83 years old, 9/14 were female, and 2/14 had CI. 6/12 caregivers were interviewed in reference to a patient with CI. We identified four overarching themes: 1) the fall as a trigger for psychological and physiological change, 2) SNF placement decision-making process, 3) direct effect of fall on caregivers and 4) barriers to receipt of recommended follow-up.

CONCLUSIONS: Older adults presenting to the ED after a fall report physical limitations and a prominent fear of falling after their injury. Caregivers play a vital role in securing the home environment, the SNF placement decision-making process, and navigating the transition of care between the ED, SNF, and outpatient visits after a fall. Clinicians should anticipate and address feelings of isolation, changes in mobility, and fear of falling in older adults seeking ED care after a fall.

Language: en

Keywords

Falls; caregiver; qualitative; skilled nursing facility



Characteristics of first recovery step response following unexpected loss of balance during walking: a dynamic approach

Nachmani H, Shani G, Shapiro A, Melzer I. *Gerontology* 2020; ePub(ePub): ePub.

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Abstract

INTRODUCTION: Many falls in older adults occur during walking and result in lateral falls. The ability to perform a recovery step after balance perturbation determines whether a fall will occur.

AIM: To investigate age-related changes in first recovery step kinematics and kinematic adaptations over a wide range of lateral perturbation magnitudes while walking.

METHODS: Thirty-five old (78.5 ± 5 years) and 19 young adults (26.0 ± 0.8 years) walked at their preferred walking speed on a treadmill. While walking, the subjects were exposed to announced right/left perturbations in different phases of the gait cycle that were gradually increased in order to trigger a recovery stepping response. The subjects were instructed to react naturally and try to avoid falling. Kinematic analysis was performed to analyze the first recovery step parameters (e.g., step initiation, swing duration, step length, and the estimated distance of the center of mass from the base of support [dBoS]).

RESULTS: Compared with younger adults, older adults displayed a significantly lower step threshold and at lower perturbation magnitudes during the experiment. Also, they showed slower compensatory step initiation, shorter step length, and dBoS with similar step recovery times. As the perturbation magnitudes increased, older adults showed very small, yet significant, decreases in the timing of the step response, and increased their step length. Younger adults did not show changes in the timing of stepping, with a tendency toward a significant increase in step length.

CONCLUSIONS: First compensatory step performance is impaired in older adults. In terms of the dynamic approach, older adults were more flexible, i.e., less automatic, while younger adults displayed more automatic behavior.

Language: en

Keywords

Compensatory step response; Falls; Older adults; Unexpected perturbation; Walking

Development of a fall-risk assessment profile for community-dwelling older adults by using the National Health Interview Survey in Taiwan

Chen PL, Lin HY, Ong JR, Ma HP. BMC Public Health 2020; 20(1): e234.

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Abstract

BACKGROUND: Falls represent a global health issue among older adults and cause a considerable burden on medical systems. In this study, a fall-risk assessment profile was developed for community-dwelling older adults.

METHOD: The data of survey participants aged > 65 years were obtained from three rounds (2005, 2009, and 2013) of the National Health Interview Survey in Taiwan. In total, 8356 older participants were included in this study. Logistic regression analyses were used to determine potential predictors associated with falls. The regression coefficients of the predictors in the final model were translated into scores (by multiplying by 5) and then summed to obtain a total risk-score for falls. A receiver operating characteristic (ROC) curve was used to evaluate the discriminative performance of the risk assessment profile.

RESULT: Self-reported falls within 1 year accounted for 19.1% of the total falls. The predictors that were included in the risk profile according to the logistic regression analysis results were as follows: female sex (adjusted odds ratio = 1.57; risk-score = 2), living alone (adjusted odds ratio = 1.56; risk-score = 2), urinary incontinence (adjusted odds ratio = 1.36; risk-score = 2), perceived unhealthiness (adjusted odds ratio = 1.32; risk-score = 1), perceived pain (adjusted odds ratio = 1.51; risk-score = 2), hospital admission in the past year (adjusted odds ratio = 2.42; risk-score = 4), low activity of daily living (ADL) scores (adjusted odds ratio = 1.29; risk-score = 1), and low mobility function scores (adjusted odds ratio = 1.68; risk-score = 3). At a total risk-score cutoff point of 6 (range 0-17), the model predicted falls with a sensitivity and specificity of 75.16 and 52.75%, respectively (area under the ROC curve = 0.70).

CONCLUSION: The fall-risk assessment profile comprising eight predictors-female sex, living alone, incontinence, perceived unhealthiness, perceived pain, hospital admission in the past year, low ADL scores, and low mobility function scores-may serve as an assessment tool for identification of older adults with a high risk of falling, and assessment results can be used to facilitate community-based intervention.

Language: en

Keywords

Fall; National Health Interview Survey; Older; Risk assessment profile



Does isolated somatosensory impairment affect the balance and ambulation of patients with supratentorial stroke after the acute phase?

Kim M, Lee HH, Lee J. J. Clin. Neurosci. 2020; ePub(ePub): ePub.

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Abstract

Balance and ambulation are the result of a multicomponent control process through the interaction of the sensory and motor information. Despite the clinical relevance of the somatosensory system, its role has not drawn much attention from clinical researchers in that motor impairment is considered a major cause of dysfunction. There is little research on how somatosensory impairment alone affects functional disability after stroke. The purpose of this study was to investigate the effects of isolated somatosensory deficit on the balance and ambulation ability in patients with stroke. P38 latency of the SSEP was used to evaluate the integrity of the dorsal column-medial lemniscus pathway and the SSEP reference value was derived from the formula considering individual height and age. According to the SSEP latency, subjects were classified into 'normal', 'abnormal', and 'no response' group. A total of 110 supratentorial stroke patients with at least grade 4 of the Medical Research Council scale of lower extremity on the affected side were enrolled. Berg balance scale (BBS) and functional ambulatory categories (FAC) showed significant differences among the groups ($P < 0.05$). In post-hoc analysis, the BBS and FAC was significantly different between the 'normal' and 'abnormal SSEP' group ($P = 0.013$ for BBS, $P = 0.004$ for FAC) and the 'normal' and 'no response SSEP' group ($P = 0.015$ for BBS, $P = 0.006$ for FAC). We found that isolated somatosensory impairment has a negative effect on the balance and ambulation ability in patients with supratentorial stroke after the acute phase.

Language: en

Keywords

Ambulation; Balance; Gait; Sensory; Somatosensory-evoked potential; Stroke

Physical and psychological factors affecting falls in older patients with arthritis

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Abstract

As the population ages, falls are becoming one of the leading causes of morbidity and mortality. Joint disease (either osteoarthritis or rheumatoid arthritis) is a well-known predictor of falls, and these medical conditions increase in accordance with the aging population. This study aimed to describe individual, physical, and psychological characteristics between older adults with and without a fall history. Further, we aimed to identify statistically significant physical or psychological factors associated with falls by controlling individual variables. We analyzed data from the 2014 Survey of Living Conditions and Welfare Needs of Korean Older Adults. Adults aged 65 years or over with doctor-diagnosed joint disease were eligible. A total of 2707 women and 784 men ($n = 3491$) were enrolled. Of these, 1174 patients suffered a fall within a year (average number of falls = 2.4). We adopted individual variable-adjusted models and found that limited activities of daily living (odds ratio (OR) 1.4, 95% confidence interval (CI) 1.04-1.87), fear of falling (OR 7.18, 95% CI 4.26-12.09), and depression (OR 1.28, 95% CI 1.09-1.50) significantly increased fall risks on logistic regression analysis. Our findings suggest that physical and psychological factors, especially the fear of falling, need to be addressed to prevent falls in elderly patients with arthritis.

Language: en

Keywords

arthritis; fall; older adults; public health

Posterior single-stepping thresholds are prospectively related to falls in older women

Crenshaw JR, Bernhardt KA, Atkinson EJ, Achenbach SJ, Khosla S, Amin S, Kaufman KR. *Aging Clin. Exp. Res.* 2020; ePub(ePub): ePub.

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DOI 10.1007/s40520-020-01480-9 PMID 32060804

Abstract

BACKGROUND: Falls are a leading cause of injury in older women. Stepping thresholds quantify balance-reaction capabilities. It is unclear how such evaluations predict falls in comparison to, or as a complement to, other objective measures of gait, standing postural control, strength, and balance confidence. **AIMS:** The objective of this study was to determine if stepping thresholds are prospectively related to falls in older women.

METHODS: For this prospective cohort study, 125 ambulatory, community-dwelling women, age ≥ 65 years were recruited. Using a treadmill to deliver perturbations to standing participants, we determined anteroposterior single- and multiple-stepping thresholds. Here, thresholds represent the minimum perturbation magnitudes that consistently evoke one step or multiple steps. In addition, gait kinematics, obstacle-crossing kinematics, standing sway measures, unipedal stance time, the functional reach, lower extremity isometric strength, grip strength, balance confidence, and fall history were evaluated. Falls were prospectively recorded for one year.

RESULTS: Seventy-four participants (59%) fell at least once. Posterior single-stepping thresholds were the only outcome that predicted future fall status (OR = 1.50, 95% CI 1.01-2.28; AUC = .62). A multivariate approach added postural sway with eyes closed as a second predictive variable, although predictive abilities were not meaningfully improved.

DISCUSSION: These results align with the previous evidence that reactive balance is a prospective indicator of fall risk. Unlike previous studies, strength scaled to body size did not contribute to fall prediction.

CONCLUSION: Posterior single-stepping thresholds held a significant relationship with future fall status. This relationship was independent of, and superior to that of, other measures of standing balance, gait, strength, and balance confidence.

Language: en

Keywords

Balance; Balance reactions; Gait; SAFER; Standing sway; Strength



Prevention of falls in community-dwelling older adults

Ganz DA, Latham NK. *New Engl. J. Med.* 2020; 382(8): 734-743.

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From the Geriatric Research, Education, and Clinical Center and the Center for the Study of Healthcare Innovation, Implementation, and Policy, Veterans Affairs Greater Los Angeles Healthcare System, and the Division of Geriatrics, Department of Medicine, David Geffen School of Medicine at University of California, Los Angeles - all in Los Angeles (D.A.G.); and the Research Program in Men's Health: Aging and Metabolism, Boston Claude D. Pepper Older Americans Independence Center for Function Promoting Therapies, Brigham and Women's Hospital, Boston (N.K.L.).

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DOI 10.1056/NEJMcp1903252 PMID 32074420

Abstract

Patients should be asked annually about falls in the past year to identify those at high risk for future falls. The risk of falling can be reduced by exercise programs focused on balance and strength training and, among persons at high risk, by assessing a standard set of risk factors for falls and addressing modifiable ones ...

Language: en

The impact of pharmacy-directed medication management for patients experiencing falls in a veterans affairs community living center

McBride K, Tomlin B. Sr. Care Pharm. 2020; 35(3): 126-135.

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DOI 10.4140/TCP.n.2020.126 PMID 32070461

Abstract

OBJECTIVE: To analyze medication interventions prior to and following implementation of the Pharmacy Medication Related Falls Risk Assessment consult service in an older adult population. **DESIGN:** Retrospective chart review. **SETTING:** This study involved patients admitted to the Cincinnati Veterans Affairs Medical Center's (VAMC) Community Living Center (CLC), an institutional practice setting. **PATIENTS, PARTICIPANTS:** Any patient who experienced a fall while admitted to the CLC during fiscal years 2013 or 2018 was considered for inclusion. Patients were excluded if falls were not evaluated by a provider, the patient expired within 10 days after falling, or falls in fiscal year 2018 that did not have a pharmacy consult placed. Fifty falls from each fiscal year were selected. **MAIN OUTCOME MEASURES:** The primary endpoint encompassed the number of pharmacy medication interventions made within 10 days postfall, with a secondary endpoint evaluating subsequent falls within 30 days of initial event. **RESULTS:** Following consult implementation, a larger number of pharmacist recommendations (40 vs. 123) and subsequent interventions (accepted recommendations) within ten days postfall (12 vs. 49) were completed. There were 14 subsequent falls within 30 days of the initial event for both fiscal years. A larger percentage of falls and patients experiencing falls from each fiscal year did not receive previous medication interventions. **CONCLUSION:** Consult implementation increased the number of pharmacist recommendations and subsequent interventions for patients within ten days postfall, reducing the risk of adverse effects, drug-drug interactions, subsequent falls, and polypharmacy.

Language: en

The influence of older adults' beliefs and attitudes on adopting fall prevention behaviors

Stevens JA, Sleet DA, Rubenstein LZ. *Am. J. Lifestyle Med.* 2018; 12(4): 324-330.

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Abstract

Among Americans aged 65 years and older, falls are the leading cause of injury death and disability, and finding effective methods to prevent older adult falls has become a public health priority. While research has identified effective interventions delivered in community and clinical settings, persuading older adults to adopt these interventions has been challenging. Older adults often do not acknowledge or recognize their fall risk. Many see falls as an inevitable consequence of aging. Health care providers can play an important role by identifying older adults who are likely to fall and providing clinical interventions to help reduce fall risks. Many older people respect the information and advice they receive from their providers. Health care practitioners can encourage patients to adopt effective fall prevention strategies by helping them understand and acknowledge their fall risk while emphasizing the positive benefits of fall prevention such as remaining independent. To help clinicians integrate fall prevention into their practice, the Centers for Disease Control and Prevention launched the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) initiative. It provides health care providers in primary care settings with resources to help them screen older adult patients, assess their fall risk, and provide effective interventions.

Language: en

Keywords

STEADI; attitudes; beliefs; elderly; fall prevention; falls; older adults

Use of fall risk-increasing drugs around a fall-related injury in older adults: a systematic review

Hart LA, Phelan EA, Yi JY, Marcum ZA, Gray SL. *J. Am. Geriatr. Soc.* 2020; ePub(ePub): ePub.

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DOI 10.1111/jgs.16369 PMID 32064594

Abstract

OBJECTIVES: To examine: (1) prevalence of fall risk-increasing drug (FRID) use among older adults with a fall-related injury, (2) which FRIDs were most frequently prescribed, (3) whether FRID use was reduced following the fall-related healthcare episode, and (4) which interventions have reduced falls or FRID use in older adults with a history of falls.

DESIGN: Systematic review. **PARTICIPANTS:** Observational and intervention studies that assessed (or intervened on) FRID use in participants aged 60 years or older who had experienced a fall. **MEASUREMENTS:** PubMed and EMBASE were searched through June 30, 2019. Two reviewers independently extracted data and evaluated studies for bias. Discrepancies were resolved by consensus.

RESULTS: Fourteen of 638 articles met selection criteria: 10 observational studies and 4 intervention studies. FRID use prevalence at time of fall-related injury ranged from 65% to 93%. Antidepressants and sedatives-hypnotics were the most commonly prescribed FRIDs. Of the 10 observational studies, only 2 used a design adequate to capture changes in FRID use after a fall-related injury, neither finding a reduction in FRID use. Three randomized controlled studies conducted in various settings (hospital, emergency department, and community pharmacy) with 12-month follow-up did not find a reduction in falls with interventions to reduce FRID use, although the study conducted in the community pharmacy setting was effective in reducing FRID use. In a nonrandomized (pre-post) intervention study conducted in an outpatient geriatrics clinic, falls were reduced in the intervention group.

CONCLUSIONS: Limited evidence indicates high prevalence of FRID use among older adults who have experienced a fall-related injury and no reduction in overall FRID use following the fall-related healthcare encounter. There is a need for well-designed interventions to reduce FRID use and falls in older adults with a history of falls. Reducing FRID use as a stand-alone intervention may not be effective in reducing recurrent falls.

Language: en

Keywords

fall-related injury; medications; older adults; systematic review

When to admit to observation: predicting length of stay for anticoagulated elderly fall victims

O'Neill KM, Jean RA, Savetamal A, Dyke A, Prunty R, Stone A, Castillo A, Gregg SC. J. Surg. Res. 2020; 250: 156-160.

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DOI 10.1016/j.jss.2020.01.006 PMID 32065966

Abstract

BACKGROUND: Geriatric patients who fall while taking an anticoagulant have a small but significant risk of delayed intracranial hemorrhage requiring observation for 24 h. However, the medical complexity associated with geriatric care may necessitate a longer stay in the hospital. Little is known about the factors associated with a successful observational status stay (<2 d) for this population.

MATERIALS AND METHODS: Elderly patients who fell while taking an anticoagulant admitted from 2012 to 2017 at an ACS level II trauma center were included in a retrospective cohort study to determine what factors were associated with a stay consistent with observational status. **INCLUSION CRITERIA:** age > 65 y old, negative initial head CT, and one of the following: INR > 3.5 if on warfarin, GCS < 14, external signs of trauma, or focal neurological deficits.

RESULTS: The cohort included 369 patients. Factors associated with decreased likelihood of successful observational status included the need for services after discharge such as an extended care facility (OR 0.06, 95% CI 0.02-0.19, $P < 0.001$) or visiting nurse agency services (OR 0.27, 95% CI 0.10-0.75, $P < 0.001$), a dementia diagnosis (OR 0.17, 95% CI 0.04-0.70, $P = 0.014$), increasing number of medications (OR 0.91, 95% CI 0.84-0.99, $P = 0.031$), and the use of coumadin (OR 0.28, 95% CI 0.12-0.70, $P = 0.006$).

CONCLUSIONS: For trauma providers, knowing your patient's medication use and particularly type of anticoagulant, comorbidities including dementia, and likely need for services after discharge will help guide the decision to admit the patient for what may be a reasonably lengthy stay versus a brief observation in the hospital for elderly fall victims on anticoagulation.

Language: en

Keywords

Financial toxicity; Geriatric; Head injury; Trauma

Characteristics of victims of fall-related accidents during mountain hiking

Faulhaber M, Ruedl G, Schneider F, Walter D, Sterr R, Schobersberger W, Schwendinger F, Pocecco E. *Int. J. Environ. Res. Public Health* 2020; 17(3): e1115.

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Abstract

The study evaluated characteristics of non-fatal mountain hiking accidents caused by falls. Questionnaires were sent to mountain hikers who suffered a fall-related accident in Tyrol (Austria) during a 3-year period. The questionnaire included details of socio-demographic data, physical activity, medication intake, defective vision, breaks, fluid intake, level of fatigue, muscle soreness, use of backpacks, use of hiking sticks, and type of shoes. Data of 405 individuals (57% females and 43% males) were included in the analyses. Victims were 56 ± 15 years of age, had a body mass index of 24.8 ± 3.5 , and indicated 4.2 ± 3.9 h/week regular physical activity. A defective vision was reported by 70% of the victims, breaks were frequent (in 80%), and alcohol intake was rare (4%) among the interviewed hikers. Subjective level of fatigue was low and only 5% reported muscle soreness. A backpack was carried by 83% of the victims and the average weight was higher in males compared to females. The majority (61%) of the victims wore ankle-height hiking shoes with a profiled sole. Victims of non-fatal falls in mountain hiking are older than the general population of mountain hikers and are often afflicted with defective vision.

Language: en

Keywords

accident; emergency; fall; mountain sports; risk

Optimization on personal fall arrest systems. Experimental dynamic studies on lanyard prototypes

Pomares JC, Carrión EÁ, González A, Saez PI. *Int. J. Environ. Res. Public Health* 2020; 17(3): e1107.

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Abstract

Tens of thousands of fall-from-height accidents take place at construction sites every year. These types of accidents range from minor to fatal, causing a significant financial burden to enterprises, personal and family traumatic experiences, high medical costs, as well as hard compensation claim settlements. It makes sense then, that some sort of effective personal protective equipment (PPE) be devised to stop these types of accidents from happening. This article aims to explain how PPE can be used to minimize personal injury and the costs implied. The main contribution of this study is that the prototypes made with dynamic ropes and terminals knotted-without an energy absorber-could safely retain falls.

RESULTS show that standards EN 354 and EN 364 need to incorporate dynamic test requirements, for the reason that a high loading rate significantly reduces the resistance in static tests that manufacturing companies claim they have. Surprisingly, more than 90 percent of work at heights use PPE without any absorber. Finally, this study calls for the need to accurately determine the dynamic response of PPE in order to further advance in improvements of these fall arrest systems with no energy absorber.

Language: en

Keywords

dynamic performance test; fall arrest systems; lanyard; low stretch kernmantle and dynamic rope; personal protective equipment; webbing