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Central nervous system medication burden and serious falls in older nursing home residents

Hanlon JT, Zhao X, Naples JG, Aspinall SL, Perera S, Nace DA, Castle NG, Greenspan SL, Thorpe CT.
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DOI 10.1111/jgs.14759 **PMID** 28152179

Abstract

OBJECTIVES: To examine the association between CNS medication burden and serious falls in those with a recent fall history.

DESIGN: Nested-case control study; cases matched to four controls by age, gender, and date.

SETTING: US nursing homes.

PARTICIPANTS: 5,556 residents age ≥ 65 with a recent fall history admitted to a nursing home between 1/1-9/30/2010 and followed until discharge, death, or December 31, 2010.

MEASUREMENTS: Outcome was serious falls as per Medicare Part A and B ICD/CPT codes. CNS burden, from Medicare Part D data, was calculated by dividing the daily dose of each CNS agent (i.e., specific antidepressants, antiepileptic, antipsychotic, benzodiazepine and opioid receptor agonists) received during the 6 days prior to the index (outcome) date by the minimum effective geriatric daily dose and summing the results across medications.

RESULTS: There were 367 cases and 1,468 matched controls. Those taking 3 + CNS standardized daily doses were more likely to have a serious fall than those not taking any CNS medications (Adjusted Odds Ratio 1.83; 95% confidence interval 1.35-2.48). There was no significant difference in fall risk for residents taking >0 to <3 CNS standardized daily doses compared to residents taking no CNS medications (Adjusted Odds Ratio 0.85; 95% CI 0.63-1.15).

CONCLUSION: CNS medication burden, approximately 3 + standardized daily doses, was associated with an increased risk of serious falls in nursing home residents with recent fall. Clinicians should be vigilant for opportunities to discontinue or decrease the doses of individual CNS medications and/or consider non-pharmacological alternatives. Such interventions that reduce use of CNS medications in nursing homes could reduce fall rates but further research is needed to confirm this.

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PDF Y Endnote Y

Death as a consequence of a hip fracture after a fall; to be further investigated?

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Arch. Trauma Res. 2016; 5(4): e33705.

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Abstract

Although it is not often thought of, elderly abuse is a frequently occurring phenomenon. Especially when an older patient dies, maltreatment is low on the list of possible causes of death. There are, however, signs that may point in the direction of abuse. These can either be on the patient's body, in the surroundings, or within the story as to how the patient died. Attention should be paid to these

often subtle signs, and autopsies need to be performed more frequently to establish the exact cause of death.

PDF Y Endnote Y

ED utilization and self-reported symptoms in community-dwelling older adults

Dermody G, Sawyer P, Kennedy R, Williams C, Brown CJ.

J. Emerg. Nurs. 2017; 43(1): 57-69.

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Abstract

The rise in ED utilization among older adults is a nursing concern, because emergency nurses are uniquely positioned to have a positive impact on the care of older adults. Symptoms have been associated with ED utilization; however, it remains unclear whether symptoms are the primary reason for ED utilization. The purpose of this study was to describe the self-reported symptoms of community-dwelling older adults prior to accessing the emergency department and to examine the differences in self-reported symptoms among those who did and did not utilize the emergency department.

METHODS: A prospective longitudinal design was used. The sample included 403 community-dwelling older adults aged 75 years and older. Baseline in-home interviews were conducted followed by monthly telephone interviews over 15 months.

RESULTS: Commonly reported symptoms at baseline included pain, feeling tired, and having shortness of breath. In univariate analysis, pain, shortness of breath, fair/poor well-being, and feeling tired were significantly correlated with ED utilization. In multivariable models, problems with balance and fair/poor well-being were significantly associated with ED utilization.

DISCUSSION: Several symptoms were common among this cohort of older adults. However, no significant differences were found in the types of symptoms reported by older adults who utilized the emergency department compared with those who did not utilize the emergency department. Based on these findings, it appears that symptoms among community-dwelling older adults may not be the primary reason for ED utilization.

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Evaluation of the impact of exercise of gait on a treadmill on balance of people who suffered from cerebral stroke

Drużbicki M, Przysada G, Guzik A, Kwolek A, Brzozowska-Magoń A, Sobolewski M.

Acta Bioeng. Biomech. 2016; 18(4): 41-48.

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DOI unavailable **PMID** 28133385

Abstract

PURPOSE: The aim of the study is to define the impact of exercise on a treadmill on static balance and stability of posture in a group of patients after cerebral stroke rehabilitated in a late period, with an application of a treadmill with the function of visual biofeedback.

METHODS: The examination was carried out in a group of 46 people in a late period after ischemic cerebral stroke. The patients examined were randomly put to a group with intervention (n = 23), in which a rehabilitation programme with an application of a treadmill with the visual feedback function was realized and to a control group (n = 23). They evaluated balance in standing on both feet by means of a force plate, symmetry of load of lower limbs and dynamic balance in Up & Go test.

RESULTS: A statistically significant change of stabilometric parameters was observed only in the area of postural sways of the centre of pressure (COP). A significant improvement of the symmetry of load of lower limbs in standing ($p = 0.0266$) was diagnosed in the examined group after the end of the programme. After the end of the programme no significant difference between the group with intervention and the control group as for a change of balance of the examined patients was found.

CONCLUSIONS: In the examined group in the chronic period after cs no significant improvement of stabilometrically evaluated balance was obtained, but improvement of the symmetry of load of lower limbs as well as improvement of dynamic balance were observed.

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Falls, risk factors and fear of falling among persons older than 65 years of age

Gazibara T, Kurtagic I, Kistic-Tepavcevic D, Nurkovic S, Kovacevic N, Gazibara T, Pekmezović T. Psychogeriatr. 2017; ePub(ePub): ePub.

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DOI 10.1111/psyg.12217 **PMID** 28130862

Abstract

AIM: Falling represents a major public health problem among older persons because it leads to premature mortality, loss of independence, and placement in assisted-living facilities. The purpose of this study was to assess the main features and risks for falls among persons older than 65 years of age as well as to quantify their fear of falling.

METHODS: A total of 354 persons older than 65 years of age were recruited at a community health centre. Characteristics of the most recent fall were obtained through detailed interviews with study participants. The Falls Efficacy Scale was used to quantify fear of falling.

RESULTS: Frequency of falling was 15.8%. Falls occurred most often while walking (49%). One-half of fallers (49.1%) sustained an injury. Head haematomas and soft tissues contusions were the most common consequences of falls. The average Falls Efficacy Scale score was significantly higher in fallers ($P = 0.001$). Multiple logistic regression analysis showed that having a fear of falling (odds ratio = 4.14, 95% confidence interval: 1.22-14.08, $P = 0.02$) and being a woman (odds ratio = 2.10, 95% confidence interval: 0.97-4.53, $P = 0.05$) were independent risk factors for falling among older persons.

CONCLUSION: The frequency of falls among older people was similar to those in other populations. These results could be used to help select older persons who should be enrolled in fall prevention programmes.

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Gait speed and variability for usual pace and pedestrian crossing conditions in older adults using the GAITRite Walkway

Brown KC, Hanson HM, Firmani F, Liu D, McAllister MM, Merali K, Puyat JH, Ashe MC.

Gerontol. Geriatr. Med. 2015; 1: e2333721415618858.

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DOI 10.1177/2333721415618858 **PMID** 28138480

Abstract

OBJECTIVES: To determine gait characteristics of community-dwelling older adults at different speeds and during a crosswalk simulation.

METHODS: Twenty-two older adults completed walking trials at self-selected slow, usual, and fast paces, and at a crosswalk simulation, using the GAITRite walkway. These objective measures were complemented by self-report health and mobility questionnaires.

RESULTS: Gait speeds at self-selected slow, usual, and fast paces were 98.7 (18.1) cm/s, 140.9 (20.4) cm/s, and 174.0 (20.6) cm/s, respectively, and at simulated crosswalk conditions was 144.2 (22.3) cm/s. For usual pace, right step length variability was 2.0 (1.4) cm and step time variability was 13.6 (7.2) ms, compared with 2.4 (1.3) cm and 17.3 (9.7) ms, respectively, for crosswalk conditions.

DISCUSSION: Our sample of healthy older adults walked at a speed exceeding standards for crossing urban streets; however, in response to a crosswalk signal, participants adopted a significantly faster and more variable gait.

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Interventions for preventing falls among older adults living in the community

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Am. Fam. Physician 2017; 95(3): 152-153.

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DOI unavailable **PMID** 28145670

Abstract [Abstract unavailable]

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Life-space and movement behavior in nursing home residents: results of a new sensor-based assessment and associated factors

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(Copyright © 2017, BioMed Central)

DOI 10.1186/s12877-017-0430-7 **PMID** 28129741

Abstract

BACKGROUND: Studies on life-space (LS) and its determinants have previously been limited to community-dwelling subjects but are lacking in institutionalized older persons. The purpose of this study was to provide an advanced descriptive analysis of LS in nursing home residents and to identify associated factors based on an established theoretical framework, using an objective, sensor-based

assessment with a high spatiotemporal resolution.

METHODS: Cross-sectional study in two nursing homes in Heidelberg, Germany (n = 65; mean age: 82.9 years; 2/3 female). Changes of location in the nursing home (Transits) as well as time spent away from the private room (TAFR) were assessed using a wireless sensor network. Measures of physical, psychosocial, cognitive, socio-demographic, and environmental factors were assessed via established motor performance tests, interviews, and proxy-reports.

RESULTS: LS of residents was largely restricted to the private room and the surrounding living unit (90%); 10% of daytime was spent outside the living unit and/or the facility. On average, TAFR was 5.1 h per day (± 2.3 ; Range: 0-8); seven Transits (6.9 ± 3.2 ; Range: 0-18) were performed per day. Linear regression analyses revealed being male, lower gait speed, higher cognitive status, and lower apathy to be associated with more Transits; higher gait speed, lower cognitive status, and less depressive symptoms were associated with more TAFR. LS was significantly increased during institutional routines (mealtimes) as compared to the rest of the day.

CONCLUSIONS: The sensor-based LS assessment provided new, objective insights into LS of institutionalized persons living in nursing homes. It revealed that residents' LS was severely limited to private rooms and adjacent living units, and that in institutional settings, daily routines such as meal times seem to be the major determinant of LS utilization. Gait speed, apathy, and depressive symptoms as well as institutional meal routines were the only modifiable predictors of Transits and/or TAFR, and thus have greatest potential to lead to an enhancement of LS when targeted with interventions. **TRIAL REGISTRATION:** Current Controlled Trials ISRCTN96090441 (retrospectively registered).

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Low testosterone, but not estradiol, is associated with incident falls in older men - the international MrOS study

Vandenput L, Mellström D, Laughlin GA, Cawthon PM, Cauley JA, Hoffman AR, Karlsson MK, Rosengren BE, Ljunggren O, Nethander M, Eriksson AL, Lorentzon M, Leung J, Kwok T, Orwoll ES, Ohlsson C.

J. Bone Miner. Res. 2017; ePub(ePub): ePub.

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(Copyright © 2017, American Society for Bone and Mineral Research)

DOI 10.1002/jbmr.3088 **PMID** 28135013

Abstract

Fracture risk is determined by bone strength and the risk of falls. The relationship between serum sex steroids and bone strength parameters in men is well known, while the predictive value of sex steroids for falls is less studied. The aim of this study was to assess the associations between serum testosterone (T) and estradiol (E2) and the likelihood of falls. Older men (aged ≥ 65 years) from the US (n = 1919), Sweden (n = 2495), and Hong Kong (n = 1469) participating in the Osteoporotic Fractures in men study had baseline T and E2 analyzed by mass spectrometry. Bioavailable (Bio) levels were calculated using mass action equations. Incident falls were ascertained every 4 months during a mean follow-up of 5.7 years. Associations between sex steroids and falls were estimated by generalized estimating equations. Fall rate was highest in the US and lowest in Hong Kong (US 0.50, Sweden 0.31, Hong Kong 0.12 fall reports/person/year). In the combined cohort of 5883 men, total T

(odds ratio (OR) per SD increase, 95% CI: 0.88, 0.86-0.91) and BioT (OR 0.86, 95% CI 0.83-0.88) were associated with incident falls in models adjusted for age and prevalent falls. These associations were only slightly attenuated after simultaneous adjustment for physical performance variables (total T: OR 0.94, 95% CI 0.91-0.96; BioT: OR 0.91, 95% CI 0.89-0.94). E2, BioE2, and sex hormone-binding globulin were not significantly associated with falls. Analyses in the individual cohorts showed that both total T and BioT were associated with falls in MrOS US and Sweden. No association was found in MrOS Hong Kong and this may be due to environmental factors rather than ethnic differences since total T and BioT predicted falls in MrOS US Asians. In conclusion, low total T and BioT levels, but not E2 or SHBG, are associated with increased falls in older men. This article is protected by copyright. All rights reserved.

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Targeting functional fitness, hearing and health-related quality of life in older adults with hearing loss: Walk, Talk 'n' Listen, study protocol for a pilot randomized controlled trial

Lambert J, Ghadry-Tavi R, Knuff K, Jutras M, Siever J, Mick P, Roque C, Jones G, Little J, Miller H, Van Bergen C, Kurtz D, Murphy MA, Jones CA.

Trials 2017; 18(1): e47.

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DOI 10.1186/s13063-017-1792-z **PMID** 28129779

Abstract

BACKGROUND: Hearing loss (HL) is a disability associated with poorer health-related quality of life including an increased risk for loneliness, isolation, functional fitness declines, falls, hospitalization and premature mortality. The purpose of this pilot trial is to determine the feasibility and acceptability of a novel intervention to reduce loneliness, improve functional fitness, social connectedness, hearing and health-related quality of life in older adults with HL.

METHODS: This 10-week, single-blind, pilot randomized control trial (RCT) will include a convenience sample of ambulatory adults aged 65 years or older with self-reported HL. Following baseline assessments, participants will be randomized to either intervention (exercise, health education, socialization and group auditory rehabilitation (GAR)) or control (GAR only) groups. The intervention group will attend a local YMCA twice a week and the control group once a week. Intervention sessions will include 45 min of strengthening, balance and resistance exercises, 30 min of group walking at a self-selected pace and 60 min of interactive health education or GAR. The control group will attend 60-min GAR sessions. GAR sessions will include education about hearing, hearing technologies, enhancing communication skills, and psychosocial support. Pre-post trial data collection and measures will include: functional fitness (gait speed, 30-s Sit to Stand Test), hearing and health-related quality of life, loneliness, depression, social participation and social support. At trial end, feasibility (recruitment, randomization, retention, acceptability) and GAR will be evaluated.

DISCUSSION: Despite evidence suggesting that HL is associated with declines in functional fitness, there are no studies aimed at addressing functional fitness declines associated with the disability of HL. This pilot trial will provide knowledge about the physical, mental and social impacts on health related to HL as a disability. This will inform the feasibility of a larger RCT and preliminary evidence about the initial effects of a novel, community-based, holistic intervention addressing both the

negative psychosocial and functional physical effects of HL among older adults. TRIAL REGISTRATION: ClinicalTrials.gov, NCT02662192. Registered on 14 January 2016.

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Comparison of physical function and falls among women with persistent symptoms of chemotherapy-induced peripheral neuropathy

Hilton C, Luoh SW, Jacobs P, Faithfull S, Horak FB.

J. Clin. Oncol. 2016; 34(3_suppl): 130.

Affiliation: Oregon Health & Science University, Portland, OR.

(Copyright © 2016, American Society of Clinical Oncology)

DOI 10.1200/jco.2016.34.3_suppl.130 **PMID** 28151308

Abstract

BACKGROUND: Chemotherapy-induced peripheral neuropathy (CIPN) is a side effect of cancer treatment that may persist and impact physical function. Studies that quantify functional consequences associated with CIPN in post-treatment cancer survivors are rare, based on self-report, or use small samples. The purpose of this study was to compare objective and self-report measures of physical function, gait patterns, and falls between women cancer survivors with or without symptoms of CIPN.

METHODS: Baseline assessments from 678 women cancer survivors enrolled in exercise trials were available for analysis. Women who self-reported symptoms of CIPN (CIPN(+)) were compared to asymptomatic women (CIPN(-)) on the following: maximal leg press strength (LPmax); timed chair stand (CS), physical performance battery (PPB), gait patterns (speed (SP), step number (SN), stride length (SL), base of support (BOS), % time in double support (%DS)), self-report physical function (PF) and disability (DIS), and falls in the past year (% fallers). Group comparisons were made using analysis of covariance, adjusting for time since diagnosis and cancer site (breast or other).

RESULTS: After excluding women who had diabetes, were premenopausal at cancer diagnosis or had not received chemotherapy, 462 cases were analyzed (age: 62±6yrs; time since diagnosis: 5.8±4.1yrs). CIPN(+) (N = 210) and CIPN(-) (N = 252) groups significantly differed on all measures (*p < 0.05; **p < 0.01), except maximal leg strength and base of support during a usual walk, with worse performance for CIPN(+).

CONCLUSIONS: In our sample of women cancer survivors, 45% had symptoms of CIPN an average of 6 years post treatment and significantly worse physical function, altered gait patterns and more falls than asymptomatic women. CIPN should be addressed early in treatment and strategies to improve function and mobility and prevent falls need to be tested. [Table: see text].

PDF N Endnote Y

Fall-related healthcare use and costs in neurogenic orthostatic hypotension with Parkinson's disease

François C, Biaggioni I, Shibao C, Ogbonnaya A, Shih HC, Farrelly E, Ziemann A, Duhig A.

J. Med. Econ. 2017; ePub(ePub): ePub.

Affiliation : Xcenda, LLC , Palm Harbor , FL.

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DOI 10.1080/13696998.2017.1284668 **PMID** 28125950

Abstract

AIMS: To compare patient characteristics, rates, and costs of medically attended falls among patients with Parkinson's disease (PD) and probable PD plus neurogenic orthostatic hypotension (PD+nOH).

MATERIALS AND METHODS: MarketScan® Commercial and Medicare Supplemental databases (1/1/2009-12/31/2013) were used to identify PD and probable PD+nOH patients. The first medical or prescription claim suggesting these diagnoses served as the index date. Baseline characteristics and post-index all-cause and fall-related healthcare utilization and costs were compared between patient groups.

RESULTS: A total of 17,421 PD and 281 PD+nOH patients were identified. Compared with PD patients, PD+nOH patients were older (77 vs 74 years; $P < 0.0001$) and had more comorbidities. Pre- and post-index date, more PD+nOH patients had a medically attended fall than PD patients (25% vs 20% [$P = 0.0159$] and 30% vs 21% [$P = 0.0002$], respectively). Fallers in both groups had similar numbers of medically attended falls 12-months pre-index (mean, 1.9), but PD+nOH fallers had more falls post-index (2.5 vs 2.0; $P = 0.0176$). Compared with PD patients, more PD+nOH patients (all $P < 0.01$) had fall-related emergency department (ED) visits (18% vs 10%), hospitalizations (7% vs 3%), and non-office visit outpatient services (15% vs 10%). Adjusted total post-index medical costs for falls (\$2,260 vs \$1,049; $P = 0.0002$) and total all-cause costs (\$31,260 vs \$20,910; $P < 0.0001$) were higher for PD+nOH vs PD patients. **LIMITATIONS:** This study had some limitations. There is no ICD-9-CM diagnosis code for nOH, so a combination of PD and OH diagnoses (with confounding conditions excluded) served as a proxy for an nOH diagnosis. Also, the rate of falls and associated costs in these cohorts might be underreported because only medically attended falls were evaluated.

CONCLUSIONS: PD+nOH patients had a higher prevalence of preexisting comorbidities and a higher rate of medically attended falls than those with PD alone, leading to increased costs of care.

PDF Y Endnote Y

Falls and frailty in prostate cancer survivors on androgen deprivation therapy

Borsch C, Garg B, Dobek JC, Doggett R, Graff JN, Beer TM, Winters-Stone KM.

J. Clin. Oncol. 2016; 34(3_suppl): 134.

Affiliation: Oregon Health & Science University, Portland, OR.

(Copyright © 2016, American Society of Clinical Oncology)

DOI 10.1200/jco.2016.34.3_suppl.134 **PMID** 28151325

Abstract

BACKGROUND: Androgen deprivation therapy (ADT) treatment for prostate cancer is associated with muscle loss, weakness and weight gain that could lead to falls and frailty, but the prevalence of these conditions in prostate cancer survivors (PCS) is poorly understood. The aim of this study is to describe the prevalence of falls and frailty in PCS on ADT and their associations with modifying factors, such as age and timing of ADT.

METHODS: Health history, cancer treatment and falls were self-reported by 146 PCS on ADT (mean age: 74+8 years). ADT usage and current versus past usage was confirmed against electronic medical records. Frailty was determined by self-report to 5 questions asking about presence or absence of fatigue, weakness, mobility difficulty, comorbidities, and weight loss, which could represent sarcopenia. Presence of each condition was summed to categorize men into one of three frailty phenotypes: frail (3-5), pre-frail (1-2) or not frail (0) groups. Since fat gain, rather than weight loss, is common with ADT and can impact function we also recalculated frailty as an "obese frailty"

phenotype substituting obesity (BMI > 30 kg/m²) for weight loss. Comparisons were performed using chi-square.

RESULTS: 38% of PCS on ADT experienced a fall in the past year and among fallers, 61% experienced a fall that resulted in an injury. Using the frailty phenotype, 29% of PCS were pre-frail and 10% were frail; however, using the obese frailty phenotype, 47% of PCS were pre-frail and 15% were frail. The absence of frailty was significantly less in older men than younger men using the frail ($p = 0.013$), but not obese frail phenotype ($p = 0.54$). Fall and frailty rates did not significantly differ between PCS who were current versus past users of ADT ($p = 0.65$ and 0.26 for falls and frailty, respectively).

CONCLUSIONS: Regardless of the frailty phenotype used, the rate of falls and prevalence of frailty among PCS on ADT was greater than fall rate (25%) and the frailty prevalence (4%) reported in large community-based samples of similarly aged men. These data also suggest that falls and frailty may continue after men stop ADT use. Research to identify risk factors for falls and frailty in PCS on ADT is warranted so that effective interventions can be developed and tested.

PDF N Endnote Y

Geographic variation in use of vestibular testing among Medicare beneficiaries

Adams ME, Marmor S, Yueh B, Kane RL.

Otolaryngol. Head Neck Surg. 2017; 156(2): 312-320.

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(Copyright © 2017, American Academy of Otolaryngology - Head and Neck Surgery Foundation, Publisher Sage)

DOI 10.1177/0194599816676450 **PMID** 28145840

Abstract

OBJECTIVE There is a lack of consensus regarding the indications for vestibular testing in the evaluation of dizziness and balance disorders. Geographic variation in health services utilization is associated with lack of consensus. To understand the variation in current practice, we investigated the patterns of use of vestibular testing and diagnosis codes for dizziness and balance disorders among individuals ≥ 65 years of age across different regions of the United States. **Study Design** Cross-sectional study. **Setting** Medicare administrative claims data. **Subjects and Methods** Using the Summarized Denominator file, a sample of the US population linked to the Surveillance, Epidemiology, and End Results (SEER)-Medicare files (years 2000-2010), we identified persons who were ≥ 65 years of age. We used multivariable analyses to determine the factors associated with vestibular testing and diagnoses.

RESULTS Of the 231,984 eligible Medicare beneficiaries, 27% were diagnosed with dizziness and balance disorders. Patterns of use of vestibular tests (eye movement recording for spontaneous nystagmus, caloric testing, and rotary chair testing) varied significantly by geographic region. Rotary chair test utilization varied most. We found significant geographic variation in vestibular testing and diagnoses after controlling for age, sex, race, Medicaid participation, and rurality.

CONCLUSIONS There may be opportunities to improve the consistency and efficiency of care for dizziness and balance disorders. It will be important to define appropriate levels of vestibular diagnostic testing and which tests add sufficient value to justify the costs. Further work is needed to better characterize the causes and consequences of variation in vestibular test utilization.

PDF Y Endnote Y

Impact of small vessel disease in the brain on gait and balance

Pinter D, Ritchie SJ, Doubal F, Gattringer T, Morris Z, Bastin ME, Del C Valdés Hernández M, Royle NA, Corley J, Muñoz Maniega S, Pattie A, Dickie DA, Staals J, Gow AJ, Starr JM, Deary IJ, Enzinger C, Fazekas F, Wardlaw J.

Sci. Rep. 2017; 7: e41637.

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(Copyright © 2017, Nature Publishing Group)

DOI 10.1038/srep41637 **PMID** 28134332

Abstract

Gait and balance impairment is highly prevalent in older people. We aimed to assess whether and how single markers of small vessel disease (SVD) or a combination thereof explain gait and balance function in the elderly. We analysed 678 community-dwelling healthy subjects from the Lothian Birth Cohort 1936 at the age of 71-74 years who had undergone comprehensive risk factor assessment, gait and balance assessment as well as brain MRI. We investigated the impact of individual SVD markers (white matter hyperintensity - WMH, microbleeds, lacunes, enlarged perivascular spaces, brain atrophy) as seen on structural brain MRI and of a global SVD score on the patients' performance. A regression model revealed that age, sex, and hypertension significantly explained gait speed. Among SVD markers white matter hyperintensity (WMH) score or volume were additional significant and independent predictors of gait speed in the regression model. A similar association was seen with the global SVD score. Our study confirms a negative impact of SVD-related morphologic brain changes on gait speed in addition to age, sex and hypertension independent from brain atrophy. The presence of WMH seems to be the major driving force for SVD on gait impairment in healthy elderly subjects.

PDF Y Endnote Y

Relationships among spinal mobility and sagittal alignment of spine and lower extremity to quality of life and risk of falls

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Gait Posture 2017; 53: 98-103.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2017.01.011 **PMID** 28126694

Abstract

Spinal deformities can affect quality of life (QOL) and risk of falling, but no studies have explored the relationships of spinal mobility and sagittal alignment of spine and the lower extremities simultaneously.

Purpose of this study is to clarify the relationship of those postural parameters to QOL and risk of falling. The study evaluated 110 subjects (41 men, 69 women; mean age, 73 years). Upright and flexion and extension angles for thoracic kyphosis, lumbar lordosis, and spinal inclination were evaluated with SpinalMouse[®]. Total-body inclination and hip and knee flexion angles in upright position were measured from lateral photographs. Subjects were divided into Fallers (n=23, 21%) and Non-fallers (n=87, 79%) based on past history of falls. QOL was assessed using the Short Form 36 Health Survey (SF-36[®]). Age, total-body inclination, spinal inclination upright and in extension, thoracic kyphosis in flexion, lumbar lordosis upright and in extension, and knee flexion correlated

significantly with the SF-36. Multiple regression analysis revealed total-body inclination and knee flexion to have the most significant relationships with the SF-36. SF-36, total-body inclination, spinal inclination in extension, thoracic kyphosis in flexion, lumbar lordosis upright and in extension, and hip and knee flexion angles differed significantly between Fallers and Non-fallers ($P < 0.05$ for all). Multivariate logistic regression analyses revealed lumbar lordosis in extension to be a significant predictor of falling ($P = 0.038$). Forward-stooped posture and knee-flexion deformity could be important indicator of lower QOL. Moreover, limited extension in the lumbar spine could be a useful screening examination for fall prevention in the elderly.

PDF Y Endnote Y

Robotic-assisted gait training in Parkinson's Disease: a 3-month follow-up randomized clinical trial

Furnari A, Calabrò RS, De Cola MC, Bartolo M, Castelli A, Mapelli A, Buttacchio G, Farini E, Bramanti P, Casale R.

Int. J. Neurosci. 2017; ePub(ePub): ePub.

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Abstract

PURPOSE: The aim of this study was to evaluate the efficacy of a Robotic-Assisted Gait Training (RAGT), together with a conventional exercise program (CEP), to improve PD ambulation, as compared to standard gait training.

METHODS: Thirty-eight patients with mild PD stage (H&Y 2-2.5) were randomly assigned to an experimental group (EG) or a control group (CG). The 19 patients in EG received 30 min RAGT (using Lokomat device), whereas the 19 controls received a conventional gait training; both groups received 30 min of CEP. Participants were evaluated before (T0), immediately after (T1), and 12 weeks after the end of treatment (T2), by using 10-MWT, Tinetti Test and the motor score of the UPDRS-III.

RESULTS: We found that Tinetti Walking (TW) ($X(2) (3) = 31.75$; $p < 0.001$), Tinetti Balance ($X(2) (3) = 74.07$; $p < 0.001$), UPDRS-III ($X(2) (3) = 6.87$; $p < 0.001$), and GDS ($X(2) (3) = 28.83$; $p < 0.001$) scores were affected by the type of the rehabilitative treatment. At T2 we found a significant difference between the two groups for TW ($t = 2.62$; $p < 0.02$, $d = 0.85$). Concerning all the study outcomes, a significant improvement was observed from T0 to T1 in both the groups. However, the functional motor gain at T2 was maintained only in the EG.

CONCLUSIONS: RAGT may significantly improve walking ability, motor function and for a maximum period of 3 months. Thus, our findings support the importance of a RAGT as a valid rehabilitative tool for PD.

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Trunk and lower limb biomechanics during stair climbing in people with and without symptomatic femoroacetabular impingement

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Abstract

BACKGROUND: Femoroacetabular impingement is a pathomechanical hip condition leading to pain and impaired physical function. It has been shown that those with femoroacetabular impingement exhibit altered gait characteristics during level walking and stair climbing, and decreased muscle force production during isometric muscle contractions. However, no studies to-date have looked at trunk kinematics or muscle activation during dynamic movements such as stair climbing in this patient population. The purpose of this study was to compare biomechanical outcomes (trunk and lower limb kinematics as well as lower limb kinetics and muscle activation) during stair climbing in those with and without symptomatic femoroacetabular impingement.

METHODS: Trunk, hip, knee and ankle kinematics, as well as hip, knee and ankle kinetics and muscle activity of nine lower limb muscles were collected during stair climbing for 20 people with clinical and radiographic femoroacetabular impingement and compared to 20 age- and sex-matched pain-free individuals.

FINDINGS: Those with femoroacetabular impingement ascended the stairs slower (effect size=0.82), had significantly increased peak trunk forward flexion angles (effect size=0.99) and external hip flexion moments (effect size=0.94) and had decreased peak external knee flexion moments (effect size=0.90) compared to the control group.

INTERPRETATION: Findings from this study indicate that while those with and without femoroacetabular impingement exhibit many biomechanical similarities when ascending stairs, differences in trunk forward flexion and joint kinetics indicate some important differences. Further longitudinal research is required to elucidate the cause of these differences as well as the clinical relevance.

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