

Safety Literature 2nd August 2020**Association of height loss with falls and sarcopenia in community-dwelling older women**

Asahi R, Yuguchi S, Kamo T, Azami M, Ogihara H, Asano S. Osteoporos Sarcopenia 2020; 6(2): 59-64.

(Copyright © 2020, Korean Society of Osteoporosis, Publisher Elsevier Publishing)

DOI 10.1016/j.afos.2020.05.003 PMID 32715095

Abstract

OBJECTIVES: Height loss is associated with vertebral fracture risk and osteoporosis. We assumed that height loss may indicate the risk of falls because the presence of osteoporosis is significantly associated with sarcopenia development. We studied the association of height loss with falls and sarcopenia.

Methods: This study included 610 community-dwelling women. We measured the height, weight, appendicular skeletal muscle mass index (ASMI), grip strength, and gait speed. Additionally, we recorded the individual's tallest height, and the presence or absence of single or multiple falls during the preceding 12 months. The participants were classified into nonheight loss, 2- to 3-cm height loss, 3- to 4-cm height loss, and over 4-cm height loss groups. The association of height loss with falls and sarcopenia were examined using multiple logistic regression analysis.

Results: We found that 3- to 4-cm height loss and over 4-cm height loss were significantly associated with falls (odds ratio [OR], 1.637; 95% confidence interval [CI], 1.023-2.619; P = 0.04), (OR, 1.742, 95% CI, 1.054-2.877; P = 0.03), respectively. Additionally, over 4-cm height loss was significantly associated with sarcopenia for ASMI calculated by participant's tallest recalled height squared (OR, 2.676; 95% CI, 1.122-6.284; P = 0.026).

Conclusions: We found that the risk of falls was advanced at 3- to 4-cm height loss and over 4-cm height loss, and sarcopenia started at over 4-cm height loss. Height loss may be a useful indicator of the risk of falls and sarcopenia.

Language: en

Keywords

Falls; Sarcopenia; Community-dwelling older women; Height loss; Trunk skeletal muscle mass

Characteristics and circumstances of falls in the community-dwelling older adult population

Molés Julio MP, Lavedán Santamaría A, Botigué Satorra T, Masot Ariño O, Esteve Clavero A, Maciá Soler ML. *J. Prim. Care Community Health* 2020; 11: e2150132720940508.

(Copyright © 2020, SAGE Publishing)

DOI 10.1177/2150132720940508 PMID 32723163

Abstract

OBJECTIVE: The study aimed to describe the characteristics and circumstances of falls in the community-dwelling older adult population.

DESIGN: This was a cross-sectional observational and descriptive study involving primary health care centers in Lleida and Castellón de la Plana, Spain. Randomized sampling was used to include 966 individuals aged 75 years or older residing in single-family homes and in possession of a health care card. Data were obtained using the Survey on Fragility in Older People in Lleida (FRALLE survey). Study variables included the occurrence of falls in the past year and fall characteristics such as whether it was a first or successive fall, cause, season, and time of the day the fall occurred, whether the respondent fell flat on the ground, and time the participant remained on the floor. Other variables involved the circumstances of the fall, including the general location of the fall and specific location within the home if applicable, lighting/weather conditions, objects which may have precipitated the fall, floor conditions, and type of footwear.

RESULTS: The prevalence of falls was 25.9% with regard to the previous year, with 70% of these participants reporting having fallen previously. Falls most often occurred by accident, during the daytime, and in the winter. Variables that showed statistical significance with regard to age group were: falling flat on the ground ($P = .031$), fall location ($P = .000$), presence of an object favoring the fall ($P = .039$), floor conditions ($P = .011$), and type of footwear ($P = .029$). By sex, variables that showed statistical significance included the need for assistance to get up ($P = .045$) and type of footwear ($P = .028$).

CONCLUSIONS: The prevalence of falls was found to be similar in the studied cities. The results show the most common characteristics and circumstances of falls in older adults in the community, making it possible to guide future preventive strategies.

Language: en

Keywords

elderly; falls; community; characteristics

Combining cognitive stimulation therapy and fall prevention exercise (CogEx) in older adults with mild to moderate dementia: a feasibility randomised controlled trial

Binns E, Kerse N, Peri K, Cheung G, Taylor D. Pilot Feasibility Stud. 2020; 6: e108.

(Copyright © 2020, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI 10.1186/s40814-020-00646-6 PMID 32724661

Abstract

BACKGROUND: People living with dementia (PLwD) have a high fall risk as cognitive impairment compromises control of gait and balance. Fall prevention exercises that are effective in healthy older adults may not work for PLwD. Cognitive stimulation therapy (CST) has been shown to improve global cognition in PLwD. A programme which combines cognitive (CST) with physical exercises may reduce falls in PLwD. The aim of this study was to assess the feasibility of undertaking a full scale randomised controlled trial to test the effectiveness of CogEx in decreasing falls in PLwD. Specific objectives included recruitment strategy, data collection, outcome measures, intervention fidelity and facilitator/participant experience.

Methods: A mixed methods feasibility randomised controlled trial recruited people from residential aged care. Inclusion criteria were ≥ 65 years old, Montreal Cognitive Assessment (MoCA) score of 10 to 26 and able to participate in a group. Participants were randomised to CST or CST combined with strength and balance exercises (CogEx). Both CST and CogEx groups were for an hour twice a week for 7 weeks. Descriptive statistics were used to report pre- and post-intervention outcome measures (MoCA, Geriatric Depression Scale-15, Quality of Life-Alzheimer's Disease, Alzheimer's Disease Assessment Scale-Cognitive 11, Brief Balance Evaluation Systems Test and Short Form Physical Performance Battery) and attendance. Qualitative analysis of participant focus groups and facilitator interviews used a conventional approach. Sessions were video recorded and exercise completion documented.

Results: Thirty-six residents were screened with 23 participants randomised to intervention (CogEx, $n = 10$) or control (CST, $n = 13$). The assessments took 45 min to 1.5 h, and there was repetition between two cognitive measures. Ten facilitators completed training with the manualised programme. Exercises were combined into the hour-long CST session; however, limited balance training occurred with participants exercising predominantly in sitting. The facilitators felt the participants engaged more and were safer in sitting.

Conclusions: The results demonstrated that while fall prevention exercises could be scheduled into the CST structure, the fidelity of the combined programme was poor. Other components of the study design need further consideration before evaluation using a randomised controlled trial is feasible.

Trial registration: anzctr.org.au (ACTRN12616000751471) 8 Jun 2016, Australian New Zealand Clinical Trials Registry.

Language: en

Keywords

Exercise; Dementia; Cognitive stimulation therapy

Incorporating pharmacist interns into a study of fall-risks

Vickery PB, Ginn G, Vickery SB. *Sr. Care Pharm.* 2020; 35(8): 360-365.

(Copyright © 2020, American Society of Consultant Pharmacists)

DOI 10.4140/TCP.n.2020.360. **PMID** 32718393

Abstract

INTRODUCTION: Inpatient falls continue to have detrimental effects on patient care and recovery. Because controllable and uncontrollable factors impact fall rates, predicting which patients are at the greatest risk can be challenging. One method includes the incorporation of student learners to help identify which patients are at the greatest risk for falls.

OBJECTIVE: To generate a scoring metric and investigate its reliability for appropriately identifying geriatric and medical psychiatric patients at risk for falling while hospitalized.

METHODS: In this single-center, quasi-experimental study, pharmacist-interns led a fall-prevention initiative at a community hospital within two behavioral health units.

RESULTS: A total of 96 patients were analyzed over the study period, revealing no notable trends for either geriatric or medical psychiatric patients. There was no significant change in the odds of falling for each fall score point increase for either the geriatric-psychiatric unit (odds ratio [OR] = 0.95; 95% confidence interval [CI] 0.83-1.08) or the medical-psychiatric unit (OR = 1.11; 95% CI 0.91-1.36).

CONCLUSION: This pharmacist-intern-led falls-prevention initiative did not provide a statistically significant reduction in falls. While the scoring metric was helpful in reviewing charts to make recommendations for interventions, the assigned score did not correlate as expected to incidents of falls.

Language: en

Keywords

Humans; Risk Factors; Accidental Falls; Odds Ratio; Hospitals, Community; Pharmacists; Reproducibility of Results

Non-pharmacological interventions towards preventing the triad osteoporosis-falls risk-hip fracture, in population older than 65. scoping review

Peraza-Delgado A, Sánchez-Gómez MB, Gómez-Salgado J, Romero-Martín M, Novo-Muñoz M, Duarte-Clíments G. *J. Clin. Med.* 2020; 9(8): e2329.

(Copyright © 2020, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/jcm9082329 **PMID** 32707829

Abstract

Osteoporosis leads to increased risk of falls, and thus an increase in fractures, highlighting here hip fractures, that result in high mortality, functional disability, and high medical expenditure. The aim is to summarise the available evidence on effective non-pharmacological interventions to prevent the triad osteoporosis/falls risk/hip fracture. A scoping review was conducted consulting the Scientific Electronic Library Online (SciELO), National Institute for Health and Care Excellence (NICE), Cumulative Index to Nursing & Allied Health Literature (CINAHL) y PubMed.databases. Inclusion criteria were articles published between 2013 and 2019, in Spanish or English. In addition, publications on a population over 65 years of age covering non-pharmacological interventions aimed at hip fracture prevention for both institutionalised patients in long-stay health centres or hospitals, and patients cared for at home, both dependent and non-dependent, were included. Sixty-six articles were selected and 13 non-pharmacological interventions were identified according to the Nursing Interventions Classification taxonomy, aimed at preventing osteoporosis, falls, and hip fracture. The figures regarding the affected population according to the studies are alarming, reflecting the importance of preventing the triad osteoporosis, falls risk, and hip fracture among the population over 65 years of age. The most effective interventions were focused on increasing Bone Mineral Density through diet, exercise, and falls prevention. As a conclusion, primary prevention should be applied to the entire adult population, with special emphasis on people with osteoporosis.

Language: en

Keywords

accidental falls; risk factors; primary prevention; osteoporosis; hip fractures

Physical frailty and fall risk in community-dwelling older adults: a cross-sectional study

Chittrakul J, Siviroj P, Sungkarat S, Sapbamrer R. J. Aging Res. 2020; 2020: e3964973.

(Copyright © 2020, Hindawi)

DOI 10.1155/2020/3964973 PMID 32714612

Abstract

INTRODUCTION: Frailty is a condition in older adults with decreased physical and cognitive performance that can affect health outcomes associated with fracture, disability, and falls. The aim of this study was to compare fall risk with different physical frailty statuses and investigate factors associated with fall risk in community-dwelling older adults.

Methods: The population studied included 367 older adults (mean age = 73.2 years \pm 7.0; 237 females (64.6%) and 130 males (35.4%)) who live in Chiang Mai, Thailand. This study was of cross-sectional design. Fried's phenotype was used to screen the physical frailty status. The physiological profile assessment (PPA) was used to screen for fall risk. One-way ANOVA analysis was used to compare the fall risk between the different levels of frailty status. Linear regression analysis was used to assess the association between frailty status and fall risk.

Results: The prevalence of the frailty group was 8.7% and that of the prefrailty group was 76.8%. The three statuses of frailty identified were found to have different levels of risk of falling. The frailty group had a higher fall risk than the nonfrailty group and the prefrailty group. In addition, the nonfrailty group had a lower fall risk than the prefrailty group.

Conclusion: The frailty group had the highest fall risk in this cohort of older adults living in a community-dwelling facility. Therefore, it is important to assess the frailty status among older adults as it can be a predictor for fall risk. This assessment will therefore lead to a reduction in the rate of disability and death in the community.

Language: en

Backward walking sensitively detects fallers in persons with multiple sclerosis

Edwards EM, Daugherty AM, Nitta M, Atalla M, Fritz NE. *Mult. Scler. Relat. Disord.* 2020; 45: e102390.

(Copyright © 2020, Elsevier Publishing)

DOI 10.1016/j.msard.2020.102390 PMID 32707529

Abstract

BACKGROUND: Individuals with multiple sclerosis experience deficits in mobility resulting in injurious falls. Fall detection has proved challenging; the majority of clinical measures rely on forward walking and balance measures, yet these measures have poor sensitivity and predictive value for differentiating between fallers and non-fallers. Backward walking better differentiates fallers from non-fallers in the elderly and other neurodegenerative diseases; therefore, the objective of this study was to examine both forward and backward walking to determine the strongest, unique contributor that differentiates fallers from non-fallers in persons with multiple sclerosis.

METHODS: In a single session, spatiotemporal measures of forward and backward walking and fall history were collected. For the subsequent six months, individuals recorded falls in a fall diary. Discriminant function analysis was used to determine what variables most strongly and uniquely differentiate multiple sclerosis fallers from non-fallers.

RESULTS: Thirty-eight individuals with multiple sclerosis participated. Forward and backward velocity, stride length, and double support time as well as age, disease severity, and symptom duration were included in the models. Together, the variables differentiated between fallers and non-fallers (Wilk's lambda χ^2 (8, N = 36) = 0.497, $p < 0.001$) and in rank order, backward walking velocity was the strongest unique predictor. Repeating the analysis with a stepwise approach yielded that backward walking velocity in the first step (χ^2 (1, 34) = 0.68, $F = 15.96$, $p < 0.001$) and symptom duration in the second step ($\chi^2 = 0.59$, F (2, 33) = 11.46; $p < 0.001$) most strongly differentiated retrospective fallers and non-fallers. This stepwise model with backward walking velocity and symptom duration accurately classified 76.3% of cases. Addition of forward walking measures did not significantly improve the models, and indeed the accuracy of classification was reduced to 71.1%. Exploratory analysis showed that backward walking velocity was the best predictor of prospectively reported fallers and non-fallers (χ^2 (1, 7) = 0.43, $F = 9.20$, $p = 0.02$).

CONCLUSION: Backward walking velocity exhibits the highest effect magnitude and specificity in differentiating fallers from non-fallers in individuals with MS and demonstrates potential as clinically feasible and efficient fall detection tool.

Language: en

Keywords

Falls; Walking; Multiple Sclerosis; Backward walking

Development and validation of the standing balance assessment for individuals with spinal cord injury (SBASCI) - a new outcome measure

Singh M, Sarkar A, Kataria C. NeuroRehabilitation 2020; ePub(ePub): ePub.

(Copyright © 2020, IOS Press)

DOI 10.3233/NRE-203148 PMID 32716325

Abstract

BACKGROUND: Injury to the spinal cord results in standing balance impairment following variable sensorimotor loss. Standing balance training is a realistic goal for the majority of individuals with spinal cord injury (SCI) for which therapists need valid measures to assess standing ability in people with SCI that are relevant to functionality.

OBJECTIVE: The objective of the study was to develop an all inclusive Standing Balance Assessment for Individuals with Spinal Cord Injury (SBASCI) measure and to establish its initial psychometric properties.

METHODS: The study was carried out in three phases: Item development, scale development and scale evaluation. Literature review, focus group discussions and evaluation by experts resulted in the development of a 22-item SBASCI scale. The scale was administered on 120 participants with SCI. Exploratory factor analysis and item analysis were used to determine construct validity and internal consistency of the scale.

RESULTS: Content validity was established qualitatively and quantitatively. The scale shows high internal consistency reliability (Cronbach's alpha 0.96). The results of the exploratory factor analysis suggested a four factor structure retaining all the 22 items.

CONCLUSION: SBASCI is a valid and reliable scale to measure the standing balance of individuals with SCI. Further studies are required to establish other psychometric properties.

Language: en

Keywords

reliability; validity; Spinal cord injury; standing balance

Effects of alcohol consumption on maxillofacial fractures in simple falls

Hino S, Yamada M, Iijima Y, Araki R, Kaneko T, Horie N. Clin. Exp. Dent. Res. 2020; ePub(ePub): ePub.

(Copyright © 2020, John Wiley and Sons)

DOI 10.1002/cre2.308 PMID 32720445

Abstract

OBJECTIVES: This study aimed to investigate the effects of alcohol consumption (AC) on maxillofacial fractures caused by falls on a level surface (simple falls).

MATERIAL AND METHODS: Patients with maxillofacial fractures caused by falls who visited the Oral and Maxillofacial Surgery Clinic from January 2006 to December 2016 were evaluated. Patients with simple falls were subdivided into those who fell with AC (Falls with AC) and those who fell without AC (Falls without AC).

RESULTS: Of 180 patients with falls with maxillofacial fractures, 155 had simple falls, and 25 patients had falls from a height. Of the simple falls, 52 were Falls with AC, and 102 were Falls without AC. Falls with AC were significantly more frequent in males ($p = .0005$). The average number of fracture lines in the mandible was significantly higher in Falls with AC (2.13 ± 0.99 [mean \pm SD]) than in Falls without AC (1.76 ± 0.91) ($p = .011$). The average Facial Injury Severity Scale was significantly higher in Falls with AC (3.08 ± 1.43) than in Falls without AC (2.43 ± 1.29) ($p = .007$).

CONCLUSIONS: Falls with AC were associated with more severe maxillofacial fractures than Falls without AC.

Language: en

Keywords

fall; alcohol consumption; maxillofacial fractures

Fall prevention knowledge, attitudes, and behaviors: a survey of emergency providers

Davenport K, Cameron A, Samson M, Sri-On J, Liu SW. West. J. Emerg. Med. 2020; 21(4): 826-830.

(Copyright © 2020, California Chapter of the American Academy of Emergency Medicine)

DOI 10.5811/westjem.2020.4.43387 PMID 32726252

Abstract

INTRODUCTION: Falls are a frequent reason geriatric patients visit the emergency department (ED). To help providers, the Geriatric Emergency Department Guidelines were created to establish a standard of care for geriatric patients in the ED. We conducted a survey of emergency providers to assess 1) their knowledge of fall epidemiology and the geriatric ED guidelines; 2) their current ED practice for geriatric fall patients; and 3) their willingness to conduct fall-prevention interventions.

METHODS: We conducted an anonymous survey of emergency providers including attending physicians, residents, and physician assistants at a single, urban, Level 1 trauma, tertiary referral hospital in the northeast United States.

RESULTS: We had a response rate of 75% (102/136). The majority of providers felt that all geriatric patients should undergo screening for fall risk factors (84%, 86/102), and most (76%, 77/102) answered that all geriatric patients screened and at risk for falls should have an intervention performed. While most (80%, 82/102) answered that geriatric falls prevention was very important, providers were not willing to spend much time on screening or interventions. Less than half (44%, 45/102) were willing to spend 2-5 minutes on a fall risk assessment and prevention, while 46% (47/102) were willing to spend less than 2 minutes.

CONCLUSION: Emergency providers understand the importance of geriatric fall prevention but lack knowledge of which patients to screen and are not willing to spend more than a few minutes on screening for fall interventions. Future studies must take into account provider knowledge and willingness to intervene.

Language: en

Fall risk prevention: the related factors of nurses practice at general local hospital in Indonesia

Suryani L, Perdani AL, Dioso RI, Hoon LS. *Enferm. Clin.* 2020; 30(Suppl 5): 221-223.

(Copyright © 2020, Elsevier Publishing)

DOI 10.1016/j.enfcli.2019.11.059 **PMID** 32713575

Abstract

OBJECTIVE: This study aimed was to describe related factors of nurse practice in preventing fall risk in an inpatient ward at X General Local Hospital.

METHOD: A descriptive, analytical quantitative with a cross-sectional approach was used in this study. The total of 95 nurses agreed to participate by using random sampling. Data collection using a structured questionnaire and observational form. The statistical model with a chi-square analysis was used in this study.

RESULTS: The result showed a correlation between knowledge and nurse practice with OR 3.257 (1.375-7.715; $p=0.012$), attitude and nurse practice with OR 4.286 (1.775-10.345; $p=0.002$) training and nurse practice with OR value 5.455 (2.233-13.322; $p=0.000$).

CONCLUSIONS: Local authority in the hospital must apply patient safety standards to reduce injury rates, both nurses and patients. Nurses need to follow the current trend of nursing science focusing on patient safety.

Language: en

Keywords

Prevention; Nurses; Fall risk; Practice

How do skeletal and postural parameters contribute to maintain balance during walking?

Mekhael M, Labaki C, Bizdikian AJ, Bakouny Z, Otayek J, Yared F, Massaad A, Skalli W, Ghanem I, Assi A. *Hum. Mov. Sci.* 2020; 72: e102658.

(Copyright © 2020, Elsevier Publishing)

DOI 10.1016/j.humov.2020.102658 PMID 32721376

Abstract

INTRODUCTION: Maintaining balance during gait allows subjects to minimize energy expenditure and avoid falls. Gait balance can be measured by assessing the relationship between the center of mass (COM) and center of pressure (COP) during gait. Demographics, skeletal and postural parameters are known to influence gait balance.

PURPOSE: What are the determinants of dynamic balance during gait in asymptomatic adults among skeletal and demographic parameters?

METHODS: 115 adults underwent 3D gait analysis and full-body biplanar X-rays. Angles between the COM-COP line and the vertical were calculated in frontal and sagittal planes during gait: maxima, minima, and ROM were evaluated. Full-body 3D reconstructions were obtained; skeletal and postural parameters of the spine (lumbar lordosis, thoracic kyphosis, sagittal vertical axis SVA), pelvis (pelvic tilt and incidence, acetabular orientation in the 3 planes) and lower limbs (neck shaft angle femoral and tibial torsions) were calculated. A univariate followed by a multivariate analysis were computed between the COM-COP parameters and skeletal and demographic parameters.

RESULTS: The univariate analysis showed that in the frontal plane, maximum (4.6°) of the COM-COP angle was significantly correlated with weight ($r = 0.53$), age ($r = 0.28$), height ($r = 0.35$), SVA ($r = 0.23$), T1T12 ($r = 0.24$) and pelvic width ($r = 0.25$). In the sagittal plane, maximum COM-COP ($19.7 \pm 2.8^\circ$) angle was significantly correlated to acetabular tilt ($r = 0.25$) and acetabular anteversion ($r = 0.21$). The multivariate analysis showed that, in the frontal plane, an increase in the maximum of the COM-COP angle was determined by a decreasing height ($\beta = -0.28$), an increasing weight ($\beta = 0.48$), being a male ($\beta = -0.42$), and an increasing posterior acetabular coverage ($\beta = 0.22$). In the sagittal plane, an increasing maximum COM-COP angle was determined by a decreasing height ($\beta = -0.38$) and an increasing SVA ($\beta = 0.19$).

CONCLUSION: Frontal imbalance appeared to be mainly correlated to demographic parameters. Sagittal imbalance was found to be correlated with weight, height, acetabular parameters and SVA. These results suggest that in addition to demographic parameters, acetabular parameters and SVA are important determinants of balance during gait.

Language: en

Keywords

Pelvis; Balance; 3D gait analysis; Hip; Lower limbs; Spine

Impact of trunk resistance and stretching exercise on fall-related factors in patients with Parkinson's disease: a randomized controlled pilot study

Youm C, Kim Y, Noh B, Lee M, Kim J, Cheon SM. *Sensors (Basel)* 2020; 20(15): e4106.

(Copyright © 2020, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/s20154106 **PMID** 32717956

Abstract

BACKGROUND: This study aimed to examine the effect of a 12-week progressive trunk resistance and stretching exercise program on fall-related factors in patients with Parkinson's disease (PD).

METHODS: A randomized study assessed a progressive trunk resistance and stretching exercise program over a 12-week period. A total of 17 patients with PD participated and were randomly allocated into an exercise group (n = 10) or a control group (n = 7). Participants in the exercise group completed the exercise program in 60- to 90-min sessions for three days per week. Primary and secondary outcome measures included the trunk mobility scale, functional fitness test, standing balance, and sit-to-walk test.

RESULTS: The exercise group showed improvements in functional fitness, trunk mobility, standing balance, and dynamic stability compared with the control group (all $p < 0.05$). The 2.44 m timed up and go test (odds ratio (OR): 0.125) and the 2 min step test (OR: 10.584) of the functional fitness test, and the first-step length (OR: 3.558) and first-toe clearance height (OR: 4.777) of the sit-to-walk test, were different between the groups following the exercise program.

CONCLUSION: This 12-week exercise program improved fall-related factors in patients with PD and may lead to prevention of fall-related injuries.

Language: en

Keywords

falling; parkinson's disease; postural deformity; rigidity

Reduced gray matter volume and risk of falls in Parkinson's disease with dementia patients: a Voxel-based morphometry study

Cheng KL, Lin LH, Chen PC, Chiang PL, Chen YS, Chen HL, Chen MH, Chou KH, Li SH, Lu CH, Lin WC. *Int. J. Environ. Res. Public Health* 2020; 17(15): e5374.

(Copyright © 2020, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph17155374 PMID 32722623

Abstract

PURPOSE: Risk of falls is a common sequela affecting patients with Parkinson's disease (PD). Although motor impairment and dementia are correlated with falls, associations of brain structure and cognition deficits with falls remain unclear. **Material and Methods:** Thirty-five PD patients with dementia (PDD), and 37 age- and sex-matched healthy subjects were recruited for this study. All participants received structural magnetic resonance imaging (MRI) scans, and disease severity and cognitive evaluations. Additionally, patient fall history was recorded. Regional structural differences between PDD with and without fall groups were performed using voxel-based morphometry processing. Stepwise logistic regression analysis was used to predict the fall risk in PDD patients.

RESULTS: The results revealed that 48% of PDD patients experienced falls. Significantly lower gray matter volume (GMV) in the left calcarine and right inferior frontal gyrus in PDD patients with fall compared to PDD patients without fall were noted. The PDD patients with fall exhibited worse UPDRS-II scores compared to PDD patients without fall and were negatively correlated with lower GMV in the left calcarine ($p/r = 0.004/-0.492$). Furthermore, lower GMV in the left calcarine and right inferior frontal gyrus correlated with poor attention and executive functional test scores. Multiple logistic regression analysis showed that the left calcarine was the only variable ($p = 0.004$, 95% CI = 0.00-0.00) negatively associated with the fall event.

CONCLUSIONS: PDD patients exhibiting impaired motor function, lower GMV in the left calcarine and right inferior frontal gyrus, and notable cognitive deficits may have increased risk of falls.

Language: en

Keywords

dementia; fall; brain structure; executive function; Parkinson's disease