Attention, vigilance, and visuospatial function in hospitalized elderly medical patients: relationship to delirium syndromal status and motor subtype profile

Daly C, Leonard M, O'Connell H, Williams O, Awan F, Exton C, O'Connor M, Adamis D, Dunne CP, Cullen W, Meagher DJ.

Affiliation: Graduate Entry Medical School,University of Limerick,Limerick,Ireland.

Abstract

BACKGROUND: The early and effective detection of neurocognitive disorders poses a key diagnostic challenge. We examined performance on common cognitive bedside tests according to differing delirium syndromal status and clinical (motor) subtypes in hospitalized elderly medical inpatients.
METHODS: A battery of nine bedside cognitive tests was performed on elderly medical inpatients with DSM-IV delirium, subsyndromal delirium (SSD), and no delirium (ND). Patients with delirium were compared according to clinical (motor) subtypes.
RESULTS: A total of 198 patients (mean age 79.14 ± 8.26) were assessed with full syndromal delirium (FSD: n = 110), SSD (n = 45), and ND (n = 43). Delirium status was not associated with differences in terms of gender distribution, age, or overall medication use. Dementia burden increased with greater delirium status. Overall, the ability to meaningfully engage with the tests varied from 59% for the Vigilance B test to 85% for Spatial Span Forward test and was lowest in patients with FSD, where engagement ranged from 32% for the Vigilance B test to 77% for the Spatial Span Forwards test. The ND group was distinguished from SSD group for the Months of the year backwards, Vigilance B, global VSP, Clock Drawing test, and Interlocking Pentagons test. The SSD group was distinguished from the FSD group by Vigilance A, Spatial Span Forward, and Spatial Span Backwards. Regarding differences among motor subtypes in terms of percentage engagement and performance, the No subtype group had higher ratings across all tests. Delirious patients with no subtype had significantly lower scores on the DRS-R98 than for the other three subtype categories.
CONCLUSIONS: Simple bedside tests of attention, vigilance, and visuospatial ability are useful in distinguishing neurocognitive disorders, including SSD from other presentations.

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Dual-task training in older adults: the effect of additional motor tasks on mobility performance

Brustio PR, Rabaglietti E, Formica S, Liubicich ME.

Affiliation: SUISM, Centro Servizi, University of Torino, Torino, Italy.

Abstract

OBJECTIVES: Dual-task (DT) performance is common to most activities of daily living and difficulties in DT activities may reduce quality of life in older adults. This study investigated the effect of DT training in a sample of older adults.
METHODS: Sixty older adults (mean=74.4±3.1years) participated in the study. Twenty-two older adults were included in the control (CG), 19 in the single-task (ST) training and 19 in DT training group. ST group received balance and walking training twice a week for16 weeks, while DT training

group performed the same training with additional motor tasks. Data were gathered on 6m timed walk (6MTW), timed up and go test (TUG) and four square step test (FSST). DT conditions required participants to complete 6MTW, TUG and FSST, either (i) while carrying a glass of water or (ii) while carrying a ball on a round tray.

ESULTS: A significant Group x Time interaction was found in TUG (F [2,57]=29.5; p<0.01; partial $\eta2$=0.51) and in FSST (F [2,57]=23.2; p<0.01; partial $\eta2$=0.44). After intervention DT showed better scores in overall TUG (mean difference=1.21s [95% CI, 0.82-1.60]; p<0.05) and FSST (mean difference=2.51s [95% CI, 1.67-3.35]; p<0.01), whereas CG and ST did not exhibit significant changes.

CONCLUSION: Our results suggested that 16 weeks of motor DT training, using motor additional tasks as manipulation of common objects of everyday life, could improve mobility in older age.

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Factors influencing psychological well-being in patients with Parkinson's disease

Nicoletti A, Mostile G, Stocchi F, Abbruzzese G, Ceravolo R, Cortelli P, D'Amelio M, De Pandis MF, Fabbrini G, Pacchetti C, Pezzoli G, Tessitore A, Canesi M, Zappia M.

Affiliation: Department "G.F. Ingrassia", Section of Neurosciences, University of Catania, Catania, Italy.

Abstract

BACKGROUND: Both motor and non-motor symptoms could contribute to significant deterioration of psychological well-being in patients with Parkinson's disease (PD). However, its assessment has been only indirectly evaluated using tools based on health-related quality of life (HRQoL), such as the PDQ-39 scale.

OBJECTIVES: To evaluate psychological well-being in PD using a specific tool of assessment, the Psychological Well-being Scale (PWS), and its clinical correlates.

METHODS: This article reports data of patients' perception of health state, as measured by means of the PWS, from an epidemiological, cross-sectional study conducted in Italian PD patients (FORTE Study). We tested possible relationship between well-being and clinical characteristics including fatigue, depression, sleep disruption and HRQoL.

RESULTS: 272 patients completed the PWS questionnaire. Significant and clinically-relevant correlations were found between PWS total score and Parkinson's Fatigue Scale, Beck Depression Inventory, UPDRS Section I, PD Sleep Scale and PDQ-39 for HRQoL scores. Only clinically negligible correlations were found between PWS and motor scores.

CONCLUSIONS: Non-motor symptoms have a significant impact on psychological well-being in PD patients.

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Falls and fall injury in mental health inpatient units for older people

McMinn B, Booth A, Grist E, O'Brien A.

Abstract

Older people in Mental Health Inpatient Units for Older People (MHUOP) are a serious 'at risk' group, both for falling and osteoporotic injury post fall (Stubbs, 2010), as well as prolonged length of stay (Greene et al. 2001).
 PDF Y Endnote Y

Falls in older adults with multiple myeloma

Wildes TM, Fiala MA.
Eur. J. Haematol. 2017; ePub(ePub): ePub.
Affiliation: Division of Oncology, Department of Medicine, Washington University School of Medicine, St. Louis MO.

Abstract

OBJECTIVE: To examine the prevalence of falls, factors associated with falls and the relationship between falls and survival in older adults with multiple myeloma

METHODS: In an analysis of the Surveillance, Epidemiology and End Results (SEER)-Medicare Health Outcomes Survey (MHOS) linked database, we examined 405 older adults with MM and 513 matched non-cancer controls. The primary outcome was self-reported within the past 12 months. Age, race, gender, symptoms and comorbidities were self-reported in the MHOS. Survival was calculated from SEER data

RESULTS: Of the patients with MM, 171 were within 1 year of diagnosis (cohort 1) and 234 were ≥1 year post-diagnosis (cohort 2). Patients in cohort 1 and 2 were more likely to have fallen than controls (26% and 33% vs 23%, p=0.012). On multivariate analysis, among patients with myeloma (combined cohorts 1&2), factors associated with falls included self-report of fatigue [aOR 2.52 (95% CI 1.34-4.93)], depression [aOR 1.90 (95% CI 1.14-3.18)], or poorer general health [aOR 1.86 (95% CI 1.05-3.36)]. Falls were not associated with survival

CONCLUSIONS: Older adults with MM have a greater prevalence of falls than matched controls. Self-reported fatigue, depression and poorer general health are associated with greater odds of falls. This article is protected by copyright. All rights reserved.
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Falls prevention process in assisted living communities

Coughlin D, Nordman-Oliveira SE, Schlaak M, Ford JH.
J. Appl. Gerontol. 2017; ePub(ePub): ePub.
Affiliation: University of Wisconsin-Madison, WI, USA.

Abstract

Falls are a significant issue for older adults, and many older adults who once received care in nursing homes now reside in assisted living communities (ALCs). ALC staff needs to address resident falls prevention; however, federal or state requirements or oversight are limited. This research explores falls prevention in Wisconsin ALCs in the context of the Kotter Change Model to identify strategies and inform efforts to establish a more consistent, proactive falls prevention process for ALCs. A

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mixed methods approach demonstrated inconsistency and variability in the use of falls risk assessments and prevention programs, which led to the development of standardized, proactive falls prevention process flowcharts. This process, as delineated, provides ALCs with an approach to organize a comprehensive falls reduction strategy.

FINDINGS highlight the importance of educating staff regarding assessments, resident motivation, falls prevention programs, and feedback, all key components of the falls prevention process.

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Life-space predicts health care utilization in community-dwelling older adults

Kennedy RE, Williams CP, Sawyer P, Lo AX, Connelly K, Nassel A, Brown CJ.

Abstract

OBJECTIVE: To determine whether decline in life-space mobility predicts increased health care utilization among community-dwelling older adults.

METHOD: Health care utilization (number of emergency department [ED] visits and hospitalizations) was self-reported during monthly interviews among 419 community-dwelling African American and non-Hispanic White adults aged 75 years and older in The University of Alabama at Birmingham (UAB) Study of Aging II. Life-space was measured using the UAB Life-Space Assessment. Generalized estimating equations were used to examine associations of life-space at the beginning of each interval with health care utilization over the 1-month interval.

RESULTS: Overall, 400 participants were followed for 36 months. A 10-point decrease in life-space was associated with 14% increased odds of an ED visit and/or hospitalization over the next month, adjusting for demographics, transportation difficulty, comorbidity, and having a doctor visit in the last month.

DISCUSSION: Life-space is a practical alternative in predicting future health care utilization to performance-based measures, which can be difficult to incorporate into clinical or public health practice.

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Older adult multitasking performance using a gaze-contingent useful field of view

Ward N, Gaspar JG, Neider MB, Crowell J, Carbonari R, Kaczmarski H, Ringer RV, Johnson AP, Loschky LC, Kramer AF.

Abstract

OBJECTIVE: We implemented a gaze-contingent useful field of view paradigm to examine older adult multitasking performance in a simulated driving environment. Background Multitasking refers to the ability to manage multiple simultaneous streams of information. Recent work suggests that multitasking declines with age, yet the mechanisms supporting these declines are still debated. One possible framework to better understand this phenomenon is the useful field of view, or the area in

the visual field where information can be attended and processed. In particular, the useful field of view allows for the discrimination of two competing theories of real-time multitasking, a general interference account and a tunneling account.

METHODS: Twenty-five older adult subjects completed a useful field of view task that involved discriminating the orientation of lines in gaze-contingent Gabor patches appearing at varying eccentricities (based on distance from the fovea) as they operated a vehicle in a driving simulator. In half of the driving scenarios, subjects also completed an auditory two-back task to manipulate cognitive workload, and during some trials, wind was introduced as a means to alter general driving difficulty.

RESULTS: Consistent with prior work, indices of driving performance were sensitive to both wind and workload. Interestingly, we also observed a decline in Gabor patch discrimination accuracy under high cognitive workload regardless of eccentricity, which provides support for a general interference account of multitasking.

CONCLUSION: The results showed that our gaze-contingent useful field of view paradigm was able to successfully examine older adult multitasking performance in a simulated driving environment. Application This study represents the first attempt to successfully measure dynamic changes in the useful field of view for older adults completing a multitasking scenario involving driving.

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Preventing falls and fall-related injuries in state veterans homes: virtual breakthrough series collaborative

Zubkoff L, Neily J, Quigley P, Delanko V, Young-Xu Y, Boar S, Mills PD.

J. Nurs. Care Qual. 2017; ePub(ePub): ePub.

Affiliation: VA National Center for Patient Safety, White River Junction, Vermont (Drs Zubkoff, Young-Xu, and Mills and Mss Neily and Boar); Geisel School of Medicine at Dartmouth, Hanover, New Hampshire (Drs Zubkoff and Mills); Patricia A. Quigley, Nurse Consultant, LLC, St Petersburg, Florida (Dr Quigley); and National SVH Program Manager for Quality & Oversight, VA Geriatric & Extended Care Operations, Erie, Pennsylvania (Dr Delanko).

DOI 10.1097/NCQ.0000000000000309 **PMID** 29240572

Abstract This article reports on improved processes and outcomes from a virtual breakthrough series quality improvement collaborative to reduce preventable falls and fall-related injuries in 23 State Veterans Homes. Participating teams implemented 24 interventions (process changes); the most common was the postfall huddle. Teams reduced falls and fall-related injuries. This project highlights the importance of leadership support, interdisciplinary team involvement, and collaboration as essential components of fall prevention work.

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The mediating role of psychological symptoms on falls risk among older adults with osteoarthritis

Mat S, Ng CT, Fadzil F, Rozalli FI, Tan MP.

Clin. Interv. Aging 2017; 12: 2025-2032.

Affiliation: Geriatric Division, Department of Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia.

DOI 10.2147/CIA.S149991 **PMID** 29238177 **PMCID** PMC5716391

Abstract

The purpose of this study was to investigate the role of fear of falling (FoF) and psychological symptoms in explaining the relationship between osteoarthritis (OA) symptom severity and falls. Individuals aged ≥65 years with ≥2 falls or ≥1 injurious fall over the past 12 months were included in the falls group, while volunteers aged ≥65 years with no history of falls over 12 months were recruited as controls. The presence of lower extremity OA was determined radiologically and clinically. Severity of symptoms was assessed using the Western Ontario and McMaster Universities Arthritis Index (WOMAC) questionnaire. FoF and psychological status were measured with the shortened version of the Falls Efficacy Scale-International and the 21-item Depression, Anxiety and Stress Scale (DASS-21), respectively. Of 389 (229 fallers, 160 non-fallers) potential participants, mean (SD) age: 73.74 (6.60) years, 141 had clinical OA and 171 had radiological OA. Fallers with both radiological OA and clinical OA had significantly higher FoF and DASS-21 scores than non-fallers. FoF was significantly positively correlated with symptom severity in fallers and non-fallers with radiological and clinical OA. Depression, anxiety, and stress scores were only significantly correlated with symptom severity among fallers but not non-fallers in both clinical and radiological OA. The relationship between mild symptoms and reduced risk of falls compared to no symptoms in those with radiological OA was attenuated by increased anxiety. The increased falls risk associated with severe symptoms compared to mild symptoms in clinical OA was attenuated by FoF. FoF may, therefore, be a potentially modifiable risk factor for OA-associated falls which could be considered in future intervention studies.

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Timed Up and Go Test can predict recurrent falls: a longitudinal study of the community-dwelling elderly in China

Kang L, Han P, Wang J, Ma Y, Jia L, Fu L, Yu H, Chen X, Niu K, Guo Q.

Affiliation: Department of Rehabilitation Medicine.

Abstract

PURPOSE: Falling is a major health problem in community-dwelling elderly individuals. The aim of the present study was to conduct a prospective investigation to evaluate the accuracy of the Timed Up and Go Test (TUGT), 4-meter walking test, and grip strength test to screen for the risk of falls and to determine a cutoff point to be used clinically.

PATIENTS AND METHODS: This was a prospective study that included 541 participants. The fall data were obtained via face-to-face interview, and the date, site, and circumstances of any falls were recorded. TUGTs were recorded as part of a comprehensive geriatric assessment. We collected the same data at baseline and after follow-up via comprehensive geriatric assessment.

RESULTS: The incidence of falls of our study subjects was 20.8%. The recurrent-fall group had a fall rate of 6.8% during the follow-up year. The standard area under the curve (AUC) of our screening tool was >0.70, and hence our tool can be used for clinical purposes. After adjusting for age and gender, the AUC of TUGT became 0.642, so it cannot be used as a predictive tool for measuring any types of falls. However, when recurrent falls were adjusted for age and gender, the TUGT's AUC improved to 0.733 and a score of 15.96 seconds is used as a cut-point to screen recurrent falls in community-dwelling elderly Chinese individuals.

CONCLUSION: Future falls were best predicted by TUGT in recurrent fallers at baseline. A score of 15.96 seconds is used as a cut-point to screen recurrent falls in community-dwelling elderly Chinese individuals.

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Adaptation of stability during perturbed walking in Parkinson's disease

Martelli D, Luo L, Kang J, Kang UJ, Fahn S, Agrawal SK.

Affiliation: Department of Rehabilitation and Regenerative Medicine, College of Physicians and Surgeons, Columbia University, New York, NY, USA. sunil.agrawal@columbia.edu.

Abstract   \

Gait and balance disorders are major problems that contribute to falls among subjects with Parkinson's disease (PD). Strengthening the compensatory responses through the use of balance perturbations may improve balance in PD. To date, it is unclear how PD affects the ability to react and adapt to perturbations delivered while walking. This study aims to investigate how PD affects the ability to walk, respond to balance perturbations, and produce acute short-term effects to improve compensatory reactions and gait stability. A cable-driven robot was used to train nine patients with PD and nine age-matched controls with multidirectional waist-pull perturbations while walking on a treadmill. Margin of stability and base of support were evaluated while walking without cables and reacting to the perturbations. PD was associated with a reduced stability in the forward direction and the inability to produce proactive anticipatory adjustments. Both groups were able to improve the response to the disturbances and produce short-term aftereffects of increased gait stability once the cables were removed. A single session of perturbation-based balance training produced acute effects that ameliorated gait instability in PD. This result is encouraging for designing new therapeutic interventions that remediate falls risk.

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Addendum of: Fall detection in individuals with lower limb amputations using mobile phones: machine learning enhances robustness for real-world applications

Shawen N, Lonini L, Mummidisetty CK, Shparii I, Albert MV, Körding K, Jayaraman A.

Affiliation: Department of Physical Therapy and Human Movement Sciences, Northwestern University, Chicago, IL, United States.

Abstract   [This corrects the article DOI: 10.2196/mhealth.8201.].

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Fall risk factors in mid-age women: the Australian Longitudinal Study on Women's Health

White AM, Tooth LR, Peeters GMEEG.

Abstract

INTRODUCTION: In contrast to older adults, little is known about risk factors for falls in adults aged 50-64 years, despite a high prevalence of falls in this age group. The aim was to identify risk factors for falls in mid-age women and explore how associations change with age.

METHODS: Data were analyzed in 2016 from women aged 50-55 years in 2001 (born 1946-1951) in the Australian Longitudinal Study on Women's Health. The predictor variables were health-related factors (measured 2001, 2004, 2007, 2010) and the outcome was falls in the past 12 months (measured 2004, 2007, 2010, 2013). Prospective associations between predictor variables and falls measured 3 years later were analyzed using logistic regression with complete data for 4,629, 7,096, 5,911, and 5,774 participants.

RESULTS: In surveys, 20.5% (2004), 30.7% (2007), 30.5% (2010), and 26.6% (2013) of women reported a fall in the previous 12 months. In the univariable models, most factors were associated with falls 3 years later. In the multivariable models, higher odds of falling were found for overweight and obese women compared with healthy weight women at all survey intervals (OR range, 1.15-1.43). Impaired vision (OR range, 1.25-1.35) and poor physical functioning (OR range, 1.24-1.66) were associated with falls at three survey intervals. Depression (OR range, 1.31-1.42), leaking urine (OR range, 1.25-1.49), stiff/painful joints (OR range, 1.26-1.62), severe tiredness (OR range, 1.29-1.49), osteoporosis (OR range, 1.25-1.52), and hormone replacement therapy (OR range, 0.69-0.79) were associated with falls at two survey intervals. There was no obvious age-related increase or decrease in the number of statistically significant associations.

CONCLUSIONS: Identified fall risk factors varied over time, highlighting that falling involves a complex interplay of risk factors in mid-age women.

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Changes in gait and posture as factors of dynamic stability during walking in pregnancy

Krkeljas Z.

Abstract

Changes in gait and postural control during pregnancy may lead to increased fall rates during walking relative to non-pregnant women. Due to lack of empirical evidence on balance and postural control in dynamic conditions, the primary aim of this study was investigate the changes in gait and

postural control as factors of stability during walking. Gait and posture of thirty-five (35) pregnant women (27 ± 6.1 years) were analysed at self-selected walking speed, and at different stage of pregnancy. The results indicate that although the gait kinematics did not differ between the trimesters, significant associations were noted between the step width, the lateral trunk lean, and the medio-lateral deviations in centre of gravity and centre of pressure. In contrast to the static conditions, anterior-posterior postural sway is not present during walking, whereas the lateral trunk lean is the primary factor women use in pregnancy to keep the centre of gravity closer to the base of support. Postural changes and those in gait kinematics were largely affected by the relative mass gain, rather than the absolute mass. Considering the importance of relative mass gain, more attention during healthy pregnancy should be given to monitoring the timing of onset of musculoskeletal changes, and design of antenatal exercise programs targeting core strength and pelvic stability.

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Measures and effects on prevention of fall: the role of a fall working group at a university hospital

Kobayashi K, Ando K, Inagaki Y, Suzuki Y, Nagao Y, Ishiguro N, Imagama S.

Affiliation: Department of Orthopedic Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan.

Abstract

Fall in hospitalized patients can cause trauma and fractures, which can reduce ADL and QOL, whereas prevention of fall decreases medical expenses. The purpose of this study is to examine prevention of fall due to intervention from a fall working group established in our hospital. The working group focused on three main points. First, colored wrist bands for patients classified as grade 3 risk for fall are used to alert medical staff. Second, information on fall prevention was distributed to patients. Third, standardization of two bed fences and reduced use of slippers for inpatients have been introduced. We investigated falls during hospitalization for 5 years from April 2012 to March 2017. The risk of fall was evaluated as grade 1 (mild) to grade 3 (severe) using an assessment sheet developed by the working group. The incidence of fall decreased over time, with a significant decrease from 2.1% in 2012 to 1.3% in 2016 (p<0.01). Slipper use in fall cases showed a significant decrease from 45.8% in 2012 to 11.0% in 2016 (p<0.01). Among all falls, the percentage of cases with fall risks grade 1 and 2 decreased, while that for grade 3 risk increased from 32.0% in 2012 to 40.3% in 2016 (p<0.05). These results support the efforts of the fall working group have reduced the overall incidence of fall. However, fall in patients with grade 3 risk has not decreased, which suggests that better sharing of information is needed for patients at high risk for fall.

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Patients with chronic peripheral vestibular hypofunction compared to healthy subjects exhibit differences in gaze and gait behaviour when walking on stairs and ramps

Swanenburg J, Bäbler E, Adelsberger R, Straumann D, de Bruin ED.

Affiliation: Institute of Human Movement Sciences and Sport, Department of Health Sciences and Technology, ETH Zurich, Zurich, Switzerland.

Abstract

OBJECTIVE: The aim of this study was to compare gaze behaviour during stair and ramp walking between patients with chronic peripheral vestibular hypofunction and healthy human subjects.
METHODS: Twenty four (24) patients with chronic peripheral vestibular hypofunction (14 unilateral and 10 bilateral) and 24 healthy subjects performed stair and ramp up and down walks at self-selected speed. The walks were repeated five times. A mobile eye tracker was used to record gaze behaviour (defined as time directed to pre-defined areas) and an insole measurement device assessed gait (speed, step time, step length). During each walk gaze behaviour relative to i) detection of first transition area "First TA", ii) detection of steps of the mid-staircase area and the handrail "Structure", iii) detection of second transition area "Second TA", and iv) looking elsewhere "Elsewhere" was assessed and expressed as a percentage of the walk duration. For all variables, a one-way ANOVA followed by contrast tests was conducted.
RESULTS: Patients looked significantly longer at the "Structure" ($p<0.001$) and "Elsewhere" ($p<0.001$) while walking upstairs compared to walking downstairs ($p<0.013$). Patients looked significantly longer at the "Structure" ($p<0.001$) and "Elsewhere" ($p<0.001$) while walking upstairs compared to walking downstairs ($p<0.013$). No differences between groups were observed for the transition areas with exception of stair ascending. Patients were also slower going downstairs ($p = 0.002$) and presented with an increased step time ($p = 0.003$). Patients were walking faster up the ramp ($p = 0.014$) with longer step length ($p = 0.008$) compared to walking down the ramp ($p = 0.050$) with shorter step length ($p = 0.024$).
CONCLUSIONS: Patients with chronic peripheral vestibular hypofunction differed in time directed to pre-defined areas during stair and ramp walking and looked longer at stair and ramp areas of interest during walking compared to healthy subjects. Patients did not differ in time directed to pre-defined areas during the stair-floor transition area while going downstairs, an area where accidents may frequently occur.

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The ability of clinical balance measures to identify falls risk in multiple sclerosis: a systematic review and meta-analysis

Quinn G, Comber L, Galvin R, Coote S.
Clin. Rehabil. 2017; ePub(ePub): ePub.
Affiliation: Department of Clinical Therapies, Faculty of Education and Health Sciences, Health Research Institute, University of Limerick, Limerick, Ireland.

Abstract

OBJECTIVE: To determine the ability of clinical measures of balance to distinguish fallers from non-fallers and to determine their predictive validity in identifying those at risk of falls.
DATA SOURCES: AMED, CINAHL, Medline, Scopus, PubMed Central and Google Scholar. First search: July 2015. Final search: October 2017.

REVIEW METHODS: Inclusion criteria were studies of adults with a definite multiple sclerosis diagnosis, a clinical balance assessment and method of falls recording. Data were extracted independently by two reviewers. Study quality was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 scale and the modified Newcastle-Ottawa Quality Assessment Scale. Statistical analysis was conducted for the cross-sectional studies using Review Manager 5. The mean difference with 95% confidence interval in balance outcomes between fallers and non-fallers was used as the mode of analysis.

RESULTS: We included 33 studies (19 cross-sectional, 5 randomised controlled trials, 9 prospective) with a total of 3901 participants, of which 1917 (49%) were classified as fallers. The balance measures most commonly reported were the Berg Balance Scale, Timed Up and Go and Falls Efficacy Scale International. Meta-analysis demonstrated fallers perform significantly worse than non-fallers on all measures analysed except the Timed Up and Go Cognitive ($p < 0.05$), but discriminative ability of the measures is commonly not reported. Of those reported, the Activities-specific Balance Confidence Scale had the highest area under the receiver operating characteristic curve value (0.92), but without reporting corresponding measures of clinical utility.

CONCLUSION: Clinical measures of balance differ significantly between fallers and non-fallers but have poor predictive ability for falls risk in people with multiple sclerosis.

PDF Y Endnote Y

The effect of spatial auditory landmarks on ambulation

Karim AM, Rumalla K, King LA, Hullar TE.

Abstract

The maintenance of balance and posture is a result of the collaborative efforts of vestibular, proprioceptive, and visual sensory inputs, but a fourth neural input, audition, may also improve balance. Here, we tested the hypothesis that auditory inputs function as environmental spatial landmarks whose effectiveness depends on sound localization ability during ambulation. Eight blindfolded normal young subjects performed the Fukuda-Unterberger test in three auditory conditions: silence, white noise played through headphones (head-referenced condition), and white noise played through a loudspeaker placed directly in front at 135 centimeters away from the ear at ear height (earth-referenced condition). For the earth-referenced condition, an additional experiment was performed where the effect of moving the speaker azimuthal position to 45, 90, 135, and 180° was tested. Subjects performed significantly better in the earth-referenced condition than in the head-referenced or silent conditions. Performance progressively decreased over the range from 0° to 135° but all subjects then improved slightly at the 180° compared to the 135° condition. These results suggest that presence of sound dramatically improves the ability to ambulate when vision is limited, but that sound sources must be located in the external environment in order to improve balance. This supports the hypothesis that they act by providing spatial landmarks against which head and body movement and orientation may be compared and corrected. Balance improvement in the azimuthal plane mirrors sensitivity to sound movement at similar positions, indicating that similar auditory mechanisms may underlie both processes. These

results may help optimize the use of auditory cues to improve balance in particular patient populations.

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