Fractures and Head Injury

This document contains all abstracts for publications relating to fractures and head injuries from October 2019 through to December 2019. These abstracts have been sourced from SafetyLit.org and include only those relevant to falls prevention.

SafetyLit provides weekly abstracts of peer reviewed articles from researchers who work in the more than 30 distinct professional disciplines relevant to preventing and researching unintentional injuries, violence, and self-harm. Each week citations and summaries of about 400 articles and reports are included in a PDF document or through an RSS subscription.

Contents:

Fracture

The associations between seven different types of physical activity and the incidence of fracture at seven sites in healthy postmenopausal UK women

Armstrong MEG, Lacombe J, Wotton CJ, Cairns BJ, Green J, Floud S, Beral V, Reeves GK. J. Bone Miner. Res. 2019; ePub(ePub): ePub.

Affiliation

Cancer Epidemiology Unit, University of Oxford, Oxford, United Kingdom.

DOI 10.1002/jbmr.3896

PMID 31618477

Abstract

There is a paucity of information on associations between specific types of physical activity and fracture risk at different sites in otherwise healthy postmenopausal women. Therefore, we examined risk of fracture at 7 different sites associated with 7 different types of physical activity in the population-based prospective UK Million Women Study. A total of 371,279 postmenopausal women (mean age 59.8 years), rating their health as good or excellent and reporting participation in walking, cycling, gardening, doing housework, yoga, dance and sports club activities, were followed for site-specific incident fracture through record linkage to national databases on day-case and overnight hospital admissions. Cox regression yielded adjusted relative risks (RRs) and, because of the large number of statistical tests done, 99% confidence intervals (CIs) for fracture at 7 different sites in relation to 7 different physical activities. During an average follow-up of 12 years, numbers with a first site-specific fracture were: humerus (2341), forearm (1238), wrist (7358), hip (4354), femur (not neck) (617), lower leg (1184), and ankle (3629). For upper limb fractures there was significant heterogeneity across the 7 activity types (test for heterogeneity p=0.004), with gardening more than one hour/week associated with a lower risk (RR=0.91, 99%CI 0.86-0.96; p<0.0001), whereas cycling more than an hour/week was associated with an increased risk (RR=1.11, 99%CI 1.00-1.23; p=0.008). For fractures of the lower limb (including hip) there was no significant heterogeneity by type of activity, with significant approximately 5-15% reductions in risk associated with most activities, except cycling. For hip fractures, there was no significant heterogeneity by type of activity, but with significant 15-20% reductions in risk associated with walking for 1 hour/day and participating in yoga and sporting activities. Physical activity is a modifiable risk factor for fracture, but the effects differ between different types of activities and different fracture sites. This article is protected by copyright. All rights reserved.

Language: en

Keywords

epidemiology; exercise; fracture prevention; general population studies; osteoporosis

Development of a value-based algorithm for inpatient triage of elderly hip fracture patients

Konda SR, Lott A, Egol KA. J. Am. Acad. Orthop. Surg. 2019; ePub(ePub): ePub.

Affiliation

From the NYU Langone Orthopedic Hospital, NYU Langone Medical Center, Department of Orthopedics, New York, NY.

DOI

10.5435/JAAOS-D-18-00400

PMID

31567901

Abstract

INTRODUCTION: The purpose of this study was to combine a validated middle-age and geriatric trauma risk assessment tool (STTGMA) with a novel cost-prediction tool to create an objective triage tool for elderly hip fractures that would guide value-based care initiatives.

METHODS: From October 2014 to January 2018, all patients aged ≥55 years who were admitted with a primary diagnosis of hip fracture to a single level 1 trauma center were enrolled. Upon evaluation in the emergency department, demographics, injury severity, and functional status were recorded to calculate the trauma triage score (STTGMARisk). A model to predict high-cost hip fracture patients was created using similar variables (STTGMACost).

RESULTS: Three hundred sixty-one consecutive operative hip fracture patients were enrolled. Inpatient mortalities were skewed toward STTGMARisk3 with 21.4% of patients in this high-risk group ultimately expiring during their hospitalization. High-cost patients were correctly skewed to the STTGMACost2 and STTGMACost3 groups with 88.9% of all high-cost operatively treated hip fracture correctly triaged to these cohorts. Statistically significant variations were found in cost within each STTGMARisk group.

CONCLUSIONS: A simple risk score calculated upon admission (STTGMARisk and STTGMACost) was able to be used as a triage tool not only to differentiate increased mortality risk but also to predict high-cost patients based on resource utilization in hip fracture patients. LEVEL OF EVIDENCE: Prognostic, level II.

Language: en

Ten years change in post-fracture care for hip fracture patients

Shimodan S, Sato D, Takahashi K, Nakamura Y, Hyakkan R, Watanabe T, Hishimura R, Ota M, Shimizu H, Hojo Y, Hasegawa Y, Chubachi T, Yasui K, Tsujimoto T, Tsukuda Y, Asano T, Takahashi D, Takahata M, Iwasaki N, Shimizu T. J. Bone Miner. Metab. 2019; ePub(ePub): ePub.

Affiliation

Department of Orthopaedic Surgery, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Kita-15 Nishi-7, Kita-ku, Sapporo, Hokkaido, 060-8638, Japan. simitom@wg8.so-net.ne.jp.

DOI 10.1007/s00774-019-01047-3 **PMID** 31583538

Abstract

INTRODUCTION: This multicenter, retrospective study aimed to clarify the changes in postoperative care provided by orthopaedic surgeons after hip fractures and clarify the incidence of secondary fractures requiring surgery.

MATERIALS AND METHODS: Subjects were patients with hip fracture treated surgically in seven hospitals during the 10-year period from January 2008 to December 2017. Data on patient demographics, comorbidities, preoperative and postoperative osteoporosis treatments, and secondary fractures were collected from the medical records.

RESULTS: In total, 4764 new hip fractures in 982 men and 3782 women (mean age: 81.3 ± 10.0 years) were identified. Approximately 10% of patients had a history of osteoporosis drug treatment and 35% of patients received postoperative drug treatment. The proportion of patients receiving postoperative drug therapy increased by approximately 10% between 2009 and 2010, 10% between 2010 and 2011, and 10% between 2011 and 2013.
Although the rate of secondary fractures during the entire period and within 3 years decreased from 2011, the rate of secondary fracture within 1 year remained at around 2% every year.

CONCLUSIONS: The approval of new osteoporosis drugs and the establishment of osteoporosis liaison services have had a positive effect on the use of postoperative drug therapy in the orthopedic field. Our finding that the rate of secondary fracture within 1 year of the initial fracture remained around 2% every year, despite improvements in postoperative drug therapy, suggests that both rehabilitation for preventing falls and early postoperative drug therapy are essential to prevent secondary fractures.

Language: en

Keywords Anti-osteoporosis therapy; Hip fracture; Osteoporosis liaison service; Secondary fracture

Bone mass and strength and fall-related fractures in older age

Uusi-Rasi K, Karinkanta S, Tokola K, Kannus P, Sievänen H. J. Osteoporos. 2019; 2019: e5134690.

Affiliation

The UKK Institute for Health Promotion Research, Tampere,

Finland.

DOI

10.1155/2019/5134

690 **PMID**

31583071

Abstract

INTRODUCTION: Low bone mineral density is a risk factor for fractures. The aim of this follow-up study was to assess the association of various bone properties with fall-related fractures.

MATERIALS AND METHODS: 187 healthy women aged 55 to 83 years at baseline who were either physically active or inactive were followed for 20 years. They were divided into two groups by whether or not they sustained fall-related fractures: fracture group (F) and nonfracture group (NF). At baseline, several bone properties were measured with DXA and pQCT, and their physical performance was also assessed.

RESULTS: During the follow-up, 120 women had no fall-related fractures, while 67 (38%) sustained at least one fall with fracture. NF group had about 4 to 11% greater BMD at the femoral neck and distal radius; the mean differences (95% CI) were 4.5 (0.3 to 8.6) % and
11.1 (6.3 to 16.1) %, respectively. NF group also had stronger bone structure at the tibia, the mean difference in BMC at the distal tibia was 6.0 (2.2 to 9.7) %, and at the tibial shaft 3.6 (0.4 to 6.8) %. However, there was no mean difference in physical performance.

CONCLUSIONS: Low bone properties contribute to the risk of fracture if a person falls. Therefore, in the prevention of fragility fractures, it is essential to focus on improving bone mass, density, and strength during the lifetime. Reduction of falls by improving physical performance, balance, mobility, and muscle power is equally important.

Language: en

Predictors of hip fracture despite treatment with bisphosphonates among frail older adults

Zullo AR, Sorial MN, Lee Y, Lary CW, Kiel DP, Berry SD. J. Am. Geriatr. Soc. 2019; ePub(ePub): ePub.

Affiliation

Department of Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School, Hinda and Arthur Marcus Institute for Aging Research, Hebrew SeniorLife, Boston, Massachusetts.

 DOI 10.1111/jgs.16176 **PMID** 31580488

Abstract

OBJECTIVES: Bisphosphonates are effective at preventing hip fractures among older adults, yet many patients still fracture while on treatment and may benefit from additional preventive interventions. Little data are specifically available to target such efforts among bisphosphonate users. We aimed to identify predictors of hip fracture unique to frail older adults initiating pharmacologic treatment for osteoporosis.

DESIGN: Retrospective cohort using 2008-2013 linked national Minimum Data Set assessments, Medicare claims, and nursing home (NH) facility data. SETTING: NHs in the United States. PARTICIPANTS: Long-stay NH residents 65 years or older who initiated treatment with a bisphosphonate (N = 17 753). Estimates for bisphosphonate initiators were contrasted with those for calcitonin initiators (control group; N = 5348). MEASUREMENTS: Hospitalized hip fracture outcomes were measured using Part A claims. Hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated for 36 a priori selected potential predictors.

RESULTS: The mean (SD) age of the study population was 84 (8) years, 85% were women, and 51% had moderate to severe cognitive impairment. Predictors associated with a higher risk of hip fracture despite bisphosphonate use included age 75 years or older to 85 years (vs ≥65 to <75 y; HR = 1.25; 95% CI = 1.02-1.55), female sex (HR = 1.33; 95% CI = 1.06-1.67), white race (vs black race (HR = 1.87; 95% CI = 1.36-2.58), and body mass index = 18.5-24.9 (vs ≥30; HR = 1.93; 95% CI = 1.53-2.42). Independent ability to transfer (vs total dependence; HR = 3.11; 95% CI = 1.83-5.30) and occasional urinary incontinence (vs frequent; HR = 1.45; 95% CI = 1.18-1.78) were also important predictors. Dementia, diabetes, psychoactive drug use, and other characteristics were not associated with post-prescribing hip fracture. Predictors did not differ between bisphosphonate and calcitonin users.

CONCLUSION: Predictors of hip fracture among frail older adults did not differ between those who were new users of bisphosphonates vs calcitonin. Given the absence of risk factors unique to bisphosphonate users, targeting of fracture prevention efforts should extend beyond pharmacologic therapy to include existing nonpharmacologic therapies, particularly fall prevention strategies.

Fractures in Parkinson's Disease: injury patterns, hospitalization, and therapeutic aspects

Mühlenfeld N, Söhling N, Marzi I, Pieper M, Paule E, Reif PS, Strzelczyk A, Verboket RD, Willems LM. Eur. J. Trauma Emerg. Surg. 2019; ePub(ePub): ePub.

Department of Neurology, Epilepsy Center Frankfurt Rhine-Main, Goethe University Frankfurt, Frankfurt am Main, Germany.

DOI 10.1007/s00068-019-01240-z **PMID** 31608417

Abstract

AIM: The primary aim of this study was to analyze the frequency and characteristic patterns of fall-related fractures as well as consecutive hospitalization and management relating to such fractures. In addition, important pathognomonic and therapeutic aspects are discussed.

METHODS: This retrospective mono-center study was conducted at the University Hospital Frankfurt am Main, Germany. Between 2007 and 2017, a total of 145 PD patients with fall-related fractures were identified via a retrospective systematic query in the hospital information system using the ICD-10 German modification codes G20.0-G20.9. Patients with unclear or falsely coded PD were strictly excluded.

RESULTS: The mean age of the cohort was 77.7 years (± 7.5, median 77.) and 57.9% of the cohort were females (n = 84). A total number of 151 fractures were reported, with 140 patients (96.6%) suffering from one, four patients from two (2.8%), and one patient from three fractures (0.6%) at a time. For 43.9% (n = 65) of the cohort, fractures concerned lower extremities (LE) followed by trunk (38.1%, n = 58) and upper extremities (UE, 17.9%, n = 27). Most common fracture types in LE were femoral neck fractures (52.3%, n = 34). Mean length of hospital stay (LOS) was 13.6 days (95% CI 12.4-14.7). In 43.4% (n = 63) of cases, an interim admission to an intensive-care unit (ICU) was necessary. Mean ICU LOS was 2.3 days (95% CI 1.5-3.0), and mean LOS for normal care unit was 10.5 days (95% CI 10.3-12.4). Surgical treatment was necessary in 75.9% of the cases (n = 110). Patients undergoing surgical treatment showed significantly longer LOS compared to conservatively treated patients ($p < 0.001$). Moreover, fractures of the LE ($p = 0.018$) and UE ($p = 0.010$) were associated with a significant longer LOS.

CONCLUSION: Fall-related fractures are a common and relevant complication in PD patients leading to increased immobility, frequent hospitalization, and immediate surgical care. Fractures of the lower extremities and trunk were the most common in the cohort for this study. A PD patient presenting to the emergency room or at the general practitioner with a fracture should always be checked for osteoporosis and a fall-related injury should be seen as a red flag for reviewing a patient's individual therapeutic regime.

Language: en

Keywords Fall; Idiopathic parkinson syndrome; Injury; Quality of life

One-year mortality after a hip fracture: prospective study of a cohort of patients aged over 75 years old

Drevet S, Bornu BC, Bioteau C, Mazière S, Tonetti J, Merloz P, Couturier P, Gavazzi G. Geriatr. Psychol. Neuropsychiatr. Vieil. 2019; ePub(ePub): ePub.

Affiliation

Université Grenoble Alpes, France.

DOI 10.1684/pnv.2019.0821

PMID 31570328

Abstract

Hip fracture (HF) is a serious complication of the elderly who have suffered a fall. Studies focused on patients over 75 years old without excluding the most vulnerable are not frequent. Before we can think about the creation of an orthogeriatric unit, we evaluated the mortality rate one year after a HF only of patients over 75 years old and we identified associated factors with mortality, functional status and living.

METHODS: Prospective observational study of 75 years and older hospitalized for a HF in a conventional orthopaedic unit. Surgical and geriatric data collected was: instrumental activities of daily life ADL (IADL), comorbidity (cumulative illness rating scale-geriatric (CIRS-G)), mini nutritional assessment (MNA), severity, preoperative delay. A phone assessment one year after HF was about: vital and functional status, living place.

RESULTS: The mean age of 113 patients included was 87 years (76-100). The mortality rate was 35%. It was associated with low IADL day -15 ($p< 0.01$), elevated CIRS-G ($p< 0.01$), severity ($p=0.05$) and malnutrition ($p=0.05$). Preoperative delay average was 70.7 h (+/- 59) and 48.6% had surgery within 48 hours. Among survivors and from the data available, 45% had a functional decline one year after the HF and 11% were admitted in a nursing home.

CONCLUSION: Without any exclusion of frailty patients, the one-year mortality rate of HF of people aged 75 years and older was 35%. HF is a public health challenge due to its high prevalence, poor prognosis with considerable expense. The associated factors help to explain why geriatricians are required and support the project of creating an orthogeriatric unit. Nevertheless, geriatric care will not likely change prognosis of the most vulnerable patients but could improve the level of care.

Language: en

Keywords

comorbidity; elderly; functional status; hip fracture; mortality

Mortality risk among older people who did vs. Did not sustain a fracture: baseline pre-fracture strength and gait speed as predictors in a 15-year follow-up

Koivunen K, Sillanpää E, von Bonsdorff M, Sakari R, Tormakangas T, Rantanen T. J. Gerontol. A Biol. Sci. Med. Sci. 2019; ePub(ePub): ePub.

Affiliation

Faculty of Sport and Health Sciences and Gerontology Research Center, University of Jyväskylä, Finland.

DOI

10.1093/gerona/glz251

PMID

31628484

Abstract

BACKGROUND: Physiological reserve, as indicated by muscle strength and gait speed, may be especially determinant of survival in people who are exposed to a health stressor. We studied whether the association between strength/speed and mortality risk would be stronger in the time period after a fracture compared to other time periods.

METHODS: Participants were population-based sample of 157 men and 325 women aged 75 and 80 years at baseline. Maximal 10-meter gait speed and maximal isometric grip and knee extension strength were tested at the baseline before the fracture. Subsequent fracture incidence and mortality were followed up for 15 years. Cox regression analysis was used to estimate fracture time-stratified effects of gait speed and muscle strength on mortality risk in three states: 1) non-fracture state, 2) the first post-fracture year and 3) after the first post-fracture year until death/end of follow-up.

RESULTS: During the follow-up, 20% of the men and 44% of the women sustained a fracture. In both sexes, lower gait speed and in women lower knee extension strength was associated with increased mortality risk in the non-fracture state. During the first post-fracture year, the mortality risk associated with slower gait and lower strength was increased and higher than in the non-fracture state. After the first post-fracture year, mortality risk associated with lower gait speed and muscle strength attenuated.

CONCLUSIONS: Lower gait speed and muscle strength were more strongly associated with mortality risk after fracture than during non-fracture time, which may indicate decreased likelihood of recovery.

Language: en

Keywords

Adverse events; Epidemiology; Fracture; Health stressors; Physical Function

Development and evaluation of fall impact protection pads using additive manufacturing

Park JH, Jung HK, Lee JR. Materials (Basel) 2019; 12(20): e12203440.

Affiliation

Department of Clothing and Textiles, Pusan National University, Busan 46241, Korea. ljrj@pusan.ac.kr.

DOI

10.3390/ma12203440

PMID

31640163

Abstract

This paper presents the development and evaluation of fall-impact protection pants for elderly women using additive manufacturing. The protective pants were designed incorporating a protective pad in the hip area to reduce the impact of falls on the human body. The protective pad is a 3D mesh structure with a curved surface to fit the human body. Pads printed with flexible thermoplastic polyurethane were combined with foam to create the final pad. The impact-absorbing performance of the pad was verified through physical impact experiments. When dropping a bowling ball onto the protective pad from heights of 15, 20, and 25 cm, the protective pad was found to reduce the impact force by more than 82% in all cases. The impact force was less than the average fracture threshold of 3472 N. A subject group and an expert group evaluated the appearance, pad characteristics, motion functionality, and the wearability of the protection pants. Despite the insertion of a pad, the pants appeared natural and had a good fit. The pads were evaluated as being well-designed in terms of their position, shape, area, thickness, weight, flexibility, ease of insertion, and ease of use. Users were comfortable performing various motions when wearing the designed protective clothing. Therefore, this work can be considered to have developed protective clothing that provides satisfactory impact-protection performance and comfort thereby advancing the possibility of applying additive manufacturing to the creation of functional garments.

Language: en

Keywords

additive manufacturing; design; fall-impact protection; protection pad; protective pants

Sub-acute more than chronic hyponatremia is associated with serious falls and hip fractures

Bhandari SK, Adams AL, Li BH, Rhee CM, Sundar S, Krasa H, Danforth KN, Kanter MH, Kalantar-Zadeh K, Jacobsen SJ, Sim JJ. Intern. Med. J. 2019; ePub(ePub): ePub.

Affiliation

Division of Nephrology and Hypertension, Kaiser Permanente Los Angeles Medical Center, Los Angeles, California, USA.

DOI 10.1111/imj.14684 **PMID** 31707754

Abstract

BACKGROUND: Falls and hip fractures among older people are associated with high morbidity and mortality. Hyponatremia may be a risk for falls/hip fractures, but the effect of hyponatremia duration is not well understood. AIMS: We sought to evaluate individuals with periods of sub-acute and chronic hyponatremia on subsequent risk for serious falls and/or hip fractures.

METHODS: Retrospective cohort study in the period 1/1/1998-6/14/2016 within an integrated health system of individuals aged ≥55 years with ≥2 outpatient serum sodium measurements. Hyponatremia was defined as sodium <135 mEq/L with sub-acute (<30 days) and chronic (>/=30 days) and analyzed as a time-dependent exposure. Multivariable Cox proportional hazards modeling was used to estimate hazard ratios (HRs) for serious falls/hip fractures based on sodium category.

RESULTS: Among 1 062 647 individuals totaling 9 762 305 sodium measurements, 96 096 serious falls/hip fracture events occurred. Incidence (per-1000-person-years) of serious falls/hip fractures were 11.5, 27.9, and 19.8 for normonatremia, sub-acute, and chronic hyponatremia. Any hyponatremia duration compared to normonatremia had a serious falls/hip fractures HR (95%CI) of 1.18(1.15, 1.22), with sub-acute and chronic hyponatremia having HRs of 1.38(1.33, 1.42) and 0.91(0.87, 0.95), respectively. Examined separately, the serious falls HR was 1.37(1.32, 1.42) and 0.92(0.88, 0.96) in sub-acute and chronic hyponatremia, respectively. Hip fracture HRs were 1.52(1.42, 1.62) and 1.00(0.92, 1.08) for sub-acute and chronic hyponatremia, respectively, compared to normonatremia.

CONCLUSIONS: Our findings suggest that early/sub-acute hyponatremia appears more vulnerable and associated with serious falls/hip fractures. Whether hyponatremia is a marker of frailty or a modifiable risk factor for falls remains to be determined. This article is protected by copyright. All rights reserved.

Language: en

Keywords

Falls; Hip Fractures; Hyponatremia; Patient Safety

Delayed intracranial hemorrhage in anticoagulated geriatric patients after ground level falls

Cocca AT, Privette A, Leon SM, Crookes BA, Hall G, Lena J, Eriksson EA. J. Emerg. Med. 2019; ePub(ePub): ePub.

Affiliation

Division of Trauma and Critical Care, Department of Surgery, Medical University of South Carolina, Charleston, South Carolina.

DOI 10.1016/j.jemermed.2019.09.011 **PMID** 31735656

Abstract

BACKGROUND: The reported risk of delayed intracranial hemorrhage (ICH) in a trauma patient on warfarin is estimated to be between 0.6% and 6%. The risk of delayed ICH in trauma patients taking novel oral anticoagulants (NOACs) is not well-defined.

OBJECTIVE: We hypothesized that there was a significant number of delayed presentations of ICH in patients on NOACs.

METHODS: A retrospective review of our trauma registry was performed on geriatric patients (age older than 64 years) who were initially evaluated at our level I trauma center, had fall from standing height or less, and were anticoagulated (warfarin or NOACs), from April 2017 to March 2018.

RESULTS: Seventy-seven patients met inclusion criteria. The mean age was 80 ± 7.7 years and 46% of patients were male. The admission head computed tomography scan was positive in 20.8% of patients. Positive scans were more common in patients on warfarin vs. NOACs (30% vs. 14%; p = 0.074) and had a significantly higher Injury Severity Score (median [interquartile range]: 9 [3-15] vs. 5 [1-9]; p = 0.030) and Abbreviated Injury Scale-Head score (median [interquartile range]: 1 [0-3] vs. 1 [0-2]; p = 0.035). The agreement between loss of consciousness (LOC) and ICH was 72% (κ = -0.064; p = 0.263). Fifty-one percent of patients had a repeat head CT. New ICH was diagnosed in 9.6% of patients. All of these patients were on NOACs.

CONCLUSIONS: A fall from standing or less in anticoagulated geriatric patients is a significant mechanism of injury resulting in ICH. The absence of LOC does not eliminate the possibility of ICH. There is a significant risk of delayed ICH for patients on NOACs and repeat evaluations should be performed. A prospective multicenter evaluation of this finding is warranted.

Language: en

Keywords

NOAC; apixaban; dabigatran; geriatric; intracranial hemorrhage; rivaroxaban; traumatic brain injury; warfarin

Correlates of fear of falling and falls efficacy in geriatric patients recovering from hip/pelvic fracture

Eckert T, Kampe K, Kohler M, Albrecht D, Büchele G, Hauer K, Schäufele M, Becker C, Pfeiffer K. Clin. Rehabil. 2019; ePub(ePub): ePub.

Affiliation

Department of Clinical Gerontology and Geriatric Rehabilitation, Robert-Bosch-Hospital, Stuttgart, Germany.

DOI 10.1177/0269215519891233 **PMID** 31789060

Abstract

OBJECTIVE: To gain a better understanding about the nature of fear of falling, this study analyzed associations between psychological and physical aspects related to fear of falling and falls efficacy in hip/pelvic fracture patients.

DESIGN: Baseline data of a randomized controlled trial. SETTING: Geriatric inpatient rehabilitation hospital. SUBJECTS: In all, 115 geriatric patients with hip/pelvic fracture (mean age: 82.5 years) reporting fear of falling within first week of inpatient rehabilitation. INTERVENTIONS: None. MAIN MEASURES: Falls efficacy (Short Falls Efficacy Scale-International; Perceived Ability to Manage Falls), fear of falling (one-item question), fall-related post-traumatic stress symptoms (six items based on Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV) criteria), physical performance (Short Physical Performance Battery) and psychological inflexibility (Acceptance and Action Questionnaire-II) were assessed.

RESULTS: Path analyses demonstrated that low falls efficacy (Short Falls Efficacy Scale International) was significantly related to poor physical performance ($\beta^* = -.277$, $P \leqslant .001$), but not to psychological inflexibility and fall-related post-traumatic stress symptoms ($P \geqslant .05$.). Fear of falling was directly associated with fall-related post-traumatic stress symptoms ($\beta^* = .270$, $P = .007$) and indirectly with psychological inflexibility ($\beta^* = .110$, $P = .022$). Low perceived ability to manage falls was significantly related to previous falls ($\beta^* = -.348$, $P \leqslant .001$), psychological inflexibility ($\beta^* = -.216$, $P = .022$) and female gender ($\beta^* = -.239$, $P \leqslant .01$).

CONCLUSION: Falls efficacy and fear of falling constitute distinct constructs. Falls efficacy measured with the Short Falls Efficacy Scale International reflects the appraisal of poor physical performance. Fear of falling measured by the single-item question constitutes a fall-specific psychological construct associated with psychological inflexibility and fall-related post-traumatic stress symptoms.

Language: en

Keywords Hip fracture; elderly; falls efficacy; fear of falling; post-traumatic stress

Head Injury

Fall-induced hospital-treated traumatic brain injuries among elderly Finns in 1970-2017

Kannus P, Niemi S, Parkkari J, Mattila V, Sievänen H. Arch. Gerontol. Geriatr. 2019; 86: 103958.

Affiliation

Injury and Osteoporosis Research Center, UKK Institute for Health Promotion Research, Tampere, Finland.

DOI 10.1016/j.archger.2019.103958

PMID

31581022

Abstract

BACKGROUND: Fall-induced traumatic brain injuries (TBI) of elderly adults are a major public health concern.

METHODS: We determined the current trends in the absolute number and incidence (per 100,000 persons) of severe fall-induced TBI among 80-year-old or older Finns by taking into account all persons who were admitted to Finnish hospitals for primary treatment of such injury between 1970 and 2017.

RESULTS: The total number of hospitalized older Finns with a fall-induced TBI increased considerably between the years 1970 and 2017, from 60 (women) and 25 (men) in 1970 to 1622 (women) and 991 (men) in 2017. The age-adjusted incidence of TBI (per 100,000 persons) also showed a clear increase from 1970 to 2017: from 167.9 to 800.4 in women (377% increase), and from 176.8 to 927.3 in men (424% increase). If this trend in the age-adjusted incidence of hospital-treated TBI continues, and the size of the 80-year-old or older Finnish population increases as predicted (from 0.29 million in 2017 to 0.49 million in 2030), the number of these severe injuries among 80-year-old or older Finns will be approximately 1.8 times higher in 2030 (4811 injuries) compared with 2613 injuries in 2017.

CONCLUSIONS: The number and age-adjusted incidence of fall-induced hospital-treated TBI among elderly Finns increased considerably between 1970 and 2017. Wide-scale fall and injury prevention measures are urgently needed, because further aging of the population is likely to worsen the problem in the near future.

Language: en

Keywords

Elderly Finnish persons; Fall-induced traumatic brain injury; Secular trends

The "headstrike" protocol: a retrospective review of a single trauma center's operational change in the management of anticoagulated ground-level falls

Keyes M, Alley A, Muertos K, Anderson B, Howerton S, Burns A, Pepe A. Am. Surg. 2019; 85(8): 821-829.

DOI

unavailable

PMID

31560301

Abstract

Anticoagulated older adults suffering ground-level falls are a specialty trauma population at risk for intracranial hemorrhage (ICH). Delays in diagnosis or initiation of anticoagulation reversal can lead to increased morbidity/mortality. A novel "Headstrike" protocol was implemented to improve the treatment efficacy and disposition of these patients. The study objective was to determine effectiveness of the "Headstrike" protocol in providing these patients with timely treatment and disposition, while maintaining positive outcomes. A trauma performance improvement database was queried for all "Headstrike" activations for a 12-month period after implementation. Demographics, patient care, and health data were collected. Descriptive statistics were used for cohort analysis. Five hundred fifteen patients were activated as a "Headstrike" during the study period. Thirty eight patients were diagnosed with ICH (7.4%), 35 of whom were identified on initial imaging. Anticoagulation reversal was ordered for 84.6 per cent of these patients. Of the patients with negative initial CT, only three patients (0.8%) were found to have a delayed ICH on routine follow-up imaging. No anticoagulant/antiplatelet agent was associated with a significantly higher risk of ICH. Implementation of the "Headstrike" protocol resulted in trauma service line resources being used more efficiently, while ensuring high-quality, expeditious care to this population.

Language: en

Falls resulting in mild traumatic brain injury and focal traumatic brain injury: a biomechanical analysis

Post A, Kendall M, Cournoyer J, Taylor K, Hoshizaki TB, Gilchrist MD, Brien S, Cusimano MD, Marshall S. Int. J. Crashworthiness 2018; 23(3): 278-289.

DOI

10.1080/13588265.2017.1316048

PMID

unavailable

Abstract

This research focuses on describing the differences between mild traumatic brain injury (mTBI) and focal traumatic brain injury (fTBI). The purpose of this research was to compare clinical mTBI and fTBI groups who incurred brain injury from falls to hard surfaces to identify clinical and biomechanical factors that may delineate between these two outcomes. Reconstructions of mTBI (n = 11) and fTBI (n = 20) cases that resulted from falls presented themselves at the hospital were conducted using computational and physical models. The cases were compared using peak and component dynamic response, brain injury criterion (BrIC), Gadd severity index and head injury criterion. Peak resultant rotational acceleration had the best percentage correct classification with 50% risk of severe TBI was found to be 21 krad/s2. The BrIC and component acceleration and rotational velocity of impact were also found to have significant predictions of risk between the two groups. This data provides information to improve risk thresholds for fTBI with application to helmet standards/development.

Language: en

Keywords

biomechanics; falls; Mild traumatic brain injury; prediction; traumatic brain injury

Age-related differences to neck range of motion and muscle strength: potential risk factors to fall-related traumatic brain injuries

Wood TA, Sosnoff JJ. Aging Clin. Exp. Res. 2019; ePub(ePub): ePub.

Affiliation

Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, 906 S. Goodwin Ave, Urbana, IL, 61801, USA. jsosnoff@illinois.edu.

DOI 10.1007/s40520-019-01429-7

PMID 31797323

Abstract

BACKGROUND: Fall-related traumatic brain injuries (TBIs) are a serious health concern for adults over the age of 75 years, yet there is limited knowledge on possible modifiable risk factors. The neck is responsible for supporting the head during falls and age-related differences to the neck muscular could provide modifiable risk factors. However, there is limited empirical data pertaining to age-related differences in neck range of motion (ROM) and muscle strength in adults over the age of 75 years. AIMS: To understand the age-related differences in neck muscle ROM and strength, we quantified neck active and passive ROM and isometric strength in four directions in young (18-30 years), young-old (60-74 years) and old-old (75-89 years) groups.

METHODS: 57 participants were divided into groups based on age. Participants underwent testing of neck active and passive ROM and neck isometric strength in flexion, extension, and lateral flexion.

RESULTS: One-way ANOVAs revealed a significant effect of group on active and passive ROM in flexion, extension, and right and left lateral flexion ($p < 0.001$). Moreover, one-way ANOVAs revealed a significant group difference in only left lateral flexion strength ($p < 0.030$), yet there were large effect sizes observed between the young and old-old groups.

DISCUSSION: These findings suggest there are some age-related differences to the neck ROM and strength, which may be placing older adults at a greater risk for fall-related TBIs.

CONCLUSION: Future research should investigate the association between neck ROM and strength and head impact during falls in older adults.

Language: en

Keywords

Aging; Muscle strength; Neck; Range of motion; Traumatic brain injuries