

2. LBP

LBP in elderly and gait

Lumbopelvic Pain and Threats to Walking Ability in Well-Functioning Older Adults: Findings from the Baltimore Longitudinal Study of Aging

Authors

- Eleanor M. Simonsick PhD, Benjamin Aronson BA, Jennifer A. Schrack PhD, Gregory E. Hicks PhD, Gerald J. Jerome PhD, Kushang V. Patel PhD, Stephanie A. Studenski MD, MPH, Luigi Ferrucci MD, PhD
- **DOI:** 10.1111/jgs.15280 [View/save citation](#)

Abstract

Objectives

To examine the potential contribution of severity of lumbopelvic pain (LPP) in well-functioning older adults to poorer walking efficiency, lack of endurance, slower gait speed, and decline in these mobility parameters over 1 to 5 years.

Design Longitudinal analysis of Baltimore Longitudinal Study of Aging data.

Setting

National Institute on Aging, Clinical Research Unit, Baltimore, Maryland.

Participants

Well-functioning men and women aged 60 to 89 (N=878).

Measurements

An interviewer-administered questionnaire was used to ascertain reported presence and severity of back and hip pain in the preceding 12 months and reported walking ability, including ease of walking a mile. Certified examiners assessed usual gait speed, the energetic cost of walking (oxygen consumption, mL per kg/m), and time taken to walk 400 m as quickly as possible. Covariates included sex, age, age-squared, race, height, weight, exercise, and smoking.

Results

Overall, 31.4% had mild LPP, and 15.7% had moderate to severe LPP. In adjusted analyses, reported walking ability ($p < .001$), endurance walk performance ($p = .007$), and energetic cost of walking ($p = .049$) were worse with increasing LPP severity. Usual gait speed did not vary according to LPP ($p = .31$). Longitudinally, over an average 2.3 years, persons with new or sustained LPP had worse follow-up level, greater mean decline, and higher likelihood of meaningful decline in reported walking ability than persons free of LPP or whose LPP resolved. Walking performance did not differ according to LPP follow-up status.

Conclusion

LPP was common in well-functioning older adults and was associated with greater energetic cost of walking and poorer perceived and observed walking endurance. The longitudinal effect of LPP is unclear, but worsening perception of walking ability and its contribution to future mobility loss warrants further attention.

Brain changes in CLBP

Clin J Pain. 2018 Mar;34(3):237-261. doi: 10.1097/AJP.0000000000000534.

The Relationship Between Structural and Functional Brain Changes and Altered Emotion and Cognition in Chronic Low Back Pain Brain Changes: A Systematic Review of MRI and fMRI Studies.

Ng SK^{1,2}, Urquhart DM², Fitzgerald PB¹, Cicuttini FM², Hussain SM², Fitzgibbon BM¹.

OBJECTIVES:

Chronic low back pain (CLBP) is a major health issue, yet its underlying mechanisms remain unknown. Studies have demonstrated the importance of emotion and cognition in chronic pain; however, the relevant brain physiology in magnetic resonance imaging (MRI) studies are unclear in CLBP populations. Therefore, this review aimed to identify MRI brain changes and examine their potential relationship with emotional and cognitive processes in CLBP.

METHODS:

A systematic search was conducted in 5 databases. Studies that recruited adult, CLBP populations, and used brain MRI protocols were included.

RESULTS:

In total, 55 studies met the inclusion criteria. Of the structural MRI studies, 10 of 15 studies found decreased gray matter and 7 of 8 studies found white matter changes in CLBP groups compared with controls. Fourteen resting-state functional MRI studies all reported differences between CLBP and control groups in the default mode network. Interestingly, only 3 of 10 functional MRI studies observed significant differences during noxious stimulation between CLBP and control groups, whereas 13 of 16 studies observed significant brain activation differences in CLBP groups during various external tasks. Finally, there were 3 studies that observed a degree of recovery in functional connectivity following intervention.

DISCUSSION:

The brain changes in CLBP groups were mainly observed in areas and networks important in emotion and cognition, rather than those typically associated with nociception. This supports the understanding that emotional and cognitive processes may be the core contributor to the CLBP experience; however, future studies need to explore these processes further.

PMID: 28719509 DOI: 10.1097/AJP.0000000000000534

Ablations

Eur Spine J. 2018 Feb 8. doi: 10.1007/s00586-018-5496-1.

Intraosseous basivertebral nerve ablation for the treatment of chronic low back pain: a prospective randomized double-blind sham-controlled multi-center study.

Fischgrund JS¹, Rhyne A², Franke J³, Sasso R⁴, Kitchel S⁵, Bae H⁶, Yeung C⁷, Truumees E⁸, Schaufele M⁹, Yuan P¹⁰, Vajkoczy P¹¹, DePalma M¹², Anderson DG¹³, Thibodeau L¹⁴, Meyer B¹⁵.

PURPOSE:

To evaluate the safety and efficacy of radiofrequency (RF) ablation of the basivertebral nerve (BVN) for the treatment of chronic low back pain (CLBP) in a Food and Drug Administration approved Investigational Device Exemption trial. The BVN has been shown to innervate endplate nociceptors which are thought to be a source of CLBP.

METHODS:

A total of 225 patients diagnosed with CLBP were randomized to either a sham (78 patients) or treatment (147 patients) intervention. The mean age within the study was 47 years (range 25-69) and the mean baseline ODI was 42. All patients had Type I or Type II Modic changes of the treated vertebral bodies. Patients were evaluated preoperatively, and at 2 weeks, 6 weeks and 3, 6 and 12 months postoperatively. The primary endpoint was the comparative change in ODI from baseline to 3 months.

RESULTS:

At 3 months, the average ODI in the treatment arm decreased 20.5 points, as compared to a 15.2 point decrease in the sham arm ($p = 0.019$, per-protocol population). A responder analysis based on ODI decrease ≥ 10 points showed that 75.6% of patients in the treatment arm as compared to 55.3% in the sham control arm exhibited a clinically meaningful improvement at 3 months.

CONCLUSION:

Patients treated with RF ablation of the BVN for CLBP exhibited significantly greater improvement in ODI at 3 months and a higher responder rate than sham treated controls. BVN ablation represents a potential minimally invasive treatment for the relief of chronic low back pain. These slides can be retrieved under Electronic Supplementary Material.

7. PELVIC ORGANS/WOMAN'S HEALTH

Endometriosis

Long-term outcomes of laparoscopic surgery for endometriosis

American Journal of Obstetrics and Gynecology — | February 14, 2018

Moawad NS, et al.

The authors aimed at analyzing the rate of recurrent pain and reoperation for patients who underwent laparoscopic excision of endometriosis. They also examined the impact of surgery on long-term quality of life and the effect on fertility following laparoscopic excision of endometriosis. As per findings, this procedure had a low rate of reoperation, and long-term improvement in pelvic pain, sexual function, quality of life and fertility outcomes, with a high satisfaction rate.

Methods

- Patients who underwent laparoscopic surgery were retrospectively studied for pelvic pain and/or endometriosis at a tertiary care university referral center for minimally invasive gynecologic surgery.
- Researchers performed a retrospective chart review as well as a prospective online and telephone questionnaire to analyze long term outcomes, pain recurrence, reoperation and fertility outcomes.
- They utilized Quality of life validated questionnaire (SF-12) and the Female Sexual Function Index (FSFI).

Results

- Laparoscopic surgery was performed on 239 subjects for pelvic pain from July 2010 to June 2015 who were identified from ICD-9 codes representing various pelvic pain symptoms.
- In this study, 69 subjects consented and filled out a comprehensive questionnaire.
- Endometriosis confirmed on pathology in 39 of these subjects.
- Researchers noticed mean follow-up period of 27.13.
- Laparoscopic excision was performed on 84.6% of the patients with endometriosis; further surgical intervention was required in 7.7% of the patients with endometriosis following the index procedure.
- At the time of the survey, two thirds of the patients with endometriosis (N=26) were still pain-free.
- Patients showing recurrence of pain following surgery were pain free for an average of 1.958 years before recurrence.
- A history of infertility for an average of 1.889 years prior to surgery was observed in one third of the endometriosis patients (N=13).
- They noticed that 76.9% of previously infertile patients attempted to conceive following surgery with 80% success rate.
- In each quality of life measurement and most sexual function indices analyzed, the endometriosis subjects showed significant improvements.

Urinary incontinence

Am J Obstet Gynecol. 2018 Feb 6. pii: S0002-9378(18)30134-0. doi: 10.1016/j.ajog.2018.01.045.

A Prospective Study of the Natural History of Urinary Incontinence in Women.

Hagan KA¹, Erekson E², Austin A³, Minassian VA⁴, Townsend MK⁵, Bynum JP³, Grodstein F⁶.

Author information

Abstract

BACKGROUND:

Symptoms of urinary incontinence are commonly perceived to vary over time; yet, there is limited quantitative evidence regarding the natural history of urinary incontinence, especially over the long-term.

OBJECTIVE:

To delineate the course of urinary incontinence symptoms over time, using two large cohorts of middle-age and older women, with data collected over 10 years.

STUDY DESIGN:

We studied 9,376 women from the Nurses' Health Study, age 56-81 years at baseline, and 7,491 women from Nurses' Health Study II, age 39-56 years, with incident urinary incontinence in 2002-3. Urinary incontinence severity was measured by the Sandvik severity index. We tracked persistence, progression, remission, and improvement of symptoms over 10 years. We also examined risk factors for urinary incontinence progression using logistic regression models.

RESULTS:

Among women age 39-56 years, 39% had slight, 45% had moderate, and 17% had severe urinary incontinence at onset. Among women age 56-81 years, 34% had slight, 45% had moderate, and 21% had severe urinary incontinence at onset. Across ages, most women reported persistence or progression of symptoms over follow-up; few (3-11%) reported remission. However, younger women and women with less severe urinary incontinence at onset were more likely to report remission or improvement of symptoms. We found that increasing age was associated with higher odds of progression only among older women (age 75-81 versus 56-60 years, odds ratio=1.84, 95% confidence interval: 1.51, 2.25). Among all women, higher body mass index was strongly associated with progression (younger women: odds ratio=2.37, 95% confidence interval: 2.00, 2.81 body mass index ≥ 30 vs. < 25 kg/m²; older women: odds ratio=1.93, 95% confidence interval: 1.62, 2.22). Additionally, greater physical activity was associated with lower odds of progression to severe urinary incontinence (younger women: odds ratio=0.86, 95% confidence interval: 0.71, 1.03, highest vs. lowest quartile of activity; older women: odds ratio=0.68, 95% confidence interval: 0.59, 0.80).

CONCLUSIONS:

Most women with incident urinary incontinence continued to experience symptoms over 10 years; few had complete remission. Identification of risk factors for urinary incontinence progression, such as body mass index and physical activity, could be important for reducing symptoms over time.

Menstrual pain

Am J Obstet Gynecol. 2018 Jan 31. pii: S0002-9378(18)30084-X. doi: 10.1016/j.ajog.2018.01.035.

CINE MRI During Spontaneous Cramps in Women with Menstrual Pain.

Hellman KM¹, Kuhn CS², Tu FF³, Dillane KE⁴, Shlobin NA³, Senapati S³, Zhou X³, Li W⁵, Prasad PV⁶.

BACKGROUND:

The lack of non-invasive methods to study dysmenorrhea has resulted in poor understanding of the mechanisms underlying pain, insufficient diagnostic tests, and limited treatment options. To address this knowledge gap, we have developed an MRI-based strategy for continuously monitoring the uterus in relation to participants' spontaneous pain perception.

OBJECTIVE:

The study objective was to evaluate whether MRI can detect real-time changes in myometrial activity during cramping episodes in women with dysmenorrhea, with a hand-held squeeze bulb for pain reporting.

STUDY DESIGN:

Sixteen women with dysmenorrhea and ten healthy control women both on and off their menses were evaluated with MRI while not taking analgesic medication. Continuous MRI was acquired using single-shot HASTE sequence along with simultaneous reporting of pain severity with a squeeze bulb. Pearson's coefficient was used to compare results between reviewers. Proportional differences between women with dysmenorrhea and controls on/off menses were evaluated with Fisher's exact test. The temporal relationships between signal changes were evaluated with Monte Carlo simulations.

RESULTS:

Spontaneous progressive decreases in myometrial signal intensity were more frequently observed in women on their menses than in the absence of pain in the same women off their menses or participants without dysmenorrhea (p 's < 0.01). Women without reductions in myometrial signal intensity on their menses either had a history of endometriosis or were not in pain. Observations of myometrial events were consistently reported between two raters blinded to menstrual pain or day status ($r=0.97$, $p<0.001$). Episodes of cramping occurred either immediately before or 32-70s after myometrial signal change onset (p 's < 0.05).

CONCLUSIONS:

Transient decreases in myometrial uterine T2-weighted signal intensity can be reliably measured in women with menstrual pain. The directionality of signal change and temporal relationship to pain onset suggest that cramping pain may be caused by a combination of uterine pressure and hemodynamic dysfunction.

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KEYWORDS:

MRI; dysmenorrhea; endometriosis; pain; uterus

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Vit D levels

Trajectory of vitamin D status during pregnancy in relation to neonatal birth size and fetal survival: A prospective cohort study

BMC Pregnancy and Childbirth — | February 15, 2018

Bärebring L, et al.

This study was planned to assess the associations between vitamin D status in early and late pregnancy with neonatal small for gestational age (SGA), low birth weight (LBW) and preterm delivery.

In addition, researchers looked for associations between vitamin D status and pregnancy loss. In this study, a higher odds of SGA and LBW were evident in association with Vitamin D deficiency in late pregnancy. Lower 25-hydroxyvitamin D (25OHD) in early pregnancy was only associated with pregnancy loss. From early to late pregnancy, vitamin D status trajectory showed an inverse association with SGA, LBW and preterm delivery.

Women with the highest increment in 25OHD showed the lowest odds. Thereby suggesting that in a healthy pregnancy, both higher vitamin D status in late pregnancy and gestational vitamin D status trajectory could play a role.

13 A. CRANIUM

Sphenopalatine ganglion

The Journal of Headache and Pain December 2018, 19:141

Measurement and implications of the distance between the sphenopalatine ganglion and nasal mucosa: a neuroimaging study

- Joan Crespi Daniel Bratbak avid Dodick Manjit Matharu Kent Are Jamtøy
Irina Aschehoug Erling Tronvik

Historical reports describe the sphenopalatine ganglion (SPG) as positioned directly under the nasal mucosa. This is the basis for the topical intranasal administration of local anaesthetic (LA) towards the sphenopalatine foramen (SPF) which is hypothesized to diffuse a distance as short as 1 mm. Nonetheless, the SPG is located in the sphenopalatine fossa, encapsulated in connective tissue, surrounded by fat tissue and separated from the nasal cavity by a bony wall. The sphenopalatine fossa communicates with the nasal cavity through the SPF, which contains neurovascular structures packed with connective tissue and is covered by mucosa in the nasal cavity. Endoscopically the SPF does not appear open. It has hitherto not been demonstrated that LA reaches the SPG using this approach.

Methods

Our group has previously identified the SPG on 3 T-MRI images merged with CT. This enabled us to measure the distance from the SPG to the nasal mucosa covering the SPF in 20 Caucasian subjects on both sides ($n=40$ ganglia). This distance was measured by two physicians. Interobserver variability was evaluated using the intraclass correlation coefficient (ICC).

Results

The mean distance from the SPG to the closest point of the nasal cavity directly over the mucosa covering the SPF was 6.77 mm (SD 1.75; range, 4.00–11.60). The interobserver variability was excellent (ICC 0.978; 95% CI: 0.939–0.990, $p < 0.001$).

Conclusions

The distance between the SPG and nasal mucosa over the SPF is longer than previously assumed. These results challenge the assumption that the intranasal topical application of LA close to the SPF can passively diffuse to the SPG.

13 B. TMJ/ORAL**Tooth brushing helps metabolic syndrome**

J Clin Periodontol. 2018 Feb 8. doi: 10.1111/jcpe.12876.

Relationship of tooth brushing to metabolic syndrome in middle-aged adults.

Tanaka A¹, Takeuchi K¹, Furuta M¹, Takeshita T^{1,2}, Suma S¹, Shinagawa T³, Shimazaki Y⁴, Yamashita Y¹.

AIM:

To examine the effect of tooth brushing on the development of metabolic syndrome, including assessment of periodontal status, in middle-aged adults.

METHODS:

This 5-year follow-up retrospective study was performed in 3722 participants (2897 males and 825 females) aged 35-64 years who underwent both medical check-ups and dental examinations. Metabolic components included obesity, elevated triglycerides, blood pressure, fasting glucose, and reduced high-density lipoprotein. Tooth brushing frequency was assessed using a questionnaire. Periodontal disease was defined as having at least one site with a pocket depth of ≥ 4 mm. Logistic regression analysis was performed to evaluate the relationship between tooth brushing frequency at the baseline examination and the development of metabolic syndrome (≥ 3 components).

RESULTS:

During follow-up, 11.1% of participants developed metabolic syndrome. After adjusting for potential confounders including periodontal disease, participants with more frequent daily tooth brushing tended to have significantly lower odds of developing metabolic syndrome (P for trend = 0.01). The risk of development of metabolic syndrome was significantly lower in participants brushing teeth ≥ 3 times/day than in those brushing teeth ≤ 1 time/day (odds ratio = 0.64, 95% confidence interval: 0.45-0.92).

CONCLUSIONS:

Frequent daily tooth brushing was associated with lower risk of development of metabolic syndrome. This article is protected by copyright. All rights reserved.

13 C. AIRWAYS/SWALLOWING/SPEECH**Insomnia and dementia**

BMC Psychiatry. 2018 Feb 7;18(1):38. doi: 10.1186/s12888-018-1623-0.

Risk of dementia in patients with primary insomnia: a nationwide population-based case-control study.

Hung CM¹, Li YC², Chen HJ^{2,3}, Lu K^{2,3}, Liang CL³, Liliang PC⁴, Tsai YD³, Wang KW⁵.

BACKGROUND:

To investigate the association between primary insomnia and dementia using a Taiwanese population-based database.

METHODS:

This case-control study involved a subset of Taiwan's National Health Insurance Research Database of reimbursement claims. We included 51,734 patients who were diagnosed with primary insomnia from 2002 to 2004 as the test group and 258,715 nonprimary insomnia participants aged 20 years or older as the reference group. We excluded patients under 20 and those with depression, post-traumatic stress disorder, and/or sleep disorders caused by organic lesion(s), drugs, or alcohol. We used a Cox proportional hazards model to assess the primary insomnia on the risk of developing dementia after adjusting for sociodemographic characteristics and comorbidities.

RESULTS:

The primary insomnia cohort had a higher prevalence of diabetes, dyslipidemia, hypertension, coronary heart disease, chronic liver disease, and chronic kidney disease at baseline. After adjusting for select comorbidities, primary insomnia remained a significant predisposing factor for developing dementia, and was associated with a 2.14-fold (95% confidence interval, 2.01-2.29) increase in dementia risk. We also found a higher risk of dementia in younger patients.

CONCLUSIONS:

Taiwanese patients with primary insomnia, especially those under 40, had a higher risk of developing dementia than those without primary insomnia.

14. HEADACHES**Trigeminal nerve involvement**

Clin J Pain. 2018 Mar;34(3):217-221. doi: 10.1097/AJP.0000000000000537.

Perceived Pain Extent is Not Associated With Widespread Pressure Pain Sensitivity, Clinical Features, Related Disability, Anxiety, or Depression in Women With Episodic Migraine.

Fernández-de-Las-Peñas C^{1,2,3}, Falla D⁴, Palacios-Ceña M^{1,2,3}, Fuensalida-Novo S^{1,2}, Arias-Burúa JL^{2,5}, Schneebeli A⁶, Arend-Nielsen L³, Barbero M⁶.

OBJECTIVE:

People with migraine present with varying pain extent and an expanded distribution of perceived pain may reflect central sensitization. The relationship between pain extent and clinical features, psychological outcomes, related disability, and pressure pain sensitivity in migraine has been poorly investigated. Our aim was to investigate whether the perceived pain extent, assessed from pain drawings, relates to measures of pressure pain sensitivity, clinical, psychological outcomes, and related disability in women with episodic migraine.

METHODS:

A total of 72 women with episodic migraine completed pain drawings, which were subsequently digitized allowing pain extent to be calculated utilising novel software. Pressure pain thresholds were assessed bilaterally over the temporalis muscle (trigeminal area), the cervical spine (extratrigeminal area), and tibialis anterior muscle (distant pain-free area). Clinical features of migraine, migraine-related disability (migraine disability assessment questionnaire [MIDAS]), and anxiety and depression (Hospital Anxiety-Depression Scale [HADS]) were also assessed. Spearman ρ correlation coefficients were computed to reveal correlations between pain extent and the remaining outcomes.

RESULTS:

No significant associations were observed between pain extent and pressure pain thresholds in trigeminal, extratrigeminal or distant pain-free areas, migraine pain features, or psychological variables including anxiety or depression, and migraine-related disability.

CONCLUSIONS:

Pain extent within the trigeminocervical area was not associated with any of the measured clinical outcomes and not related to the degree of pressure pain sensitization in women with episodic migraine. Further research is needed to determine if the presence of expanded pain areas outside of the trigeminal area can play a relevant role in the sensitization processes in migraine.

PMID: 28731960 DOI: 10.1097/AJP.0000000000000537

16. CONCUSSIONS**Helmet use**

Wilderness Environ Med. 2018 Jan 31. pii: S1080-6032(17)30320-4. doi: 10.1016/j.wem.2017.11.007.

Effect of Helmet Use on Traumatic Brain Injuries and Other Head Injuries in Alpine Sport.

Bailly N¹, Laporte JD², Afquir S³, Masson C³, Donnadiou T⁴, Delay JB², Arnoux PJ³.

INTRODUCTION:

Sport helmet effectiveness in preventing traumatic brain injury (TBI) has been repeatedly questioned. This study assesses the effect of helmet use on risk of TBI and other types of head injury (OTHI) in alpine sports.

METHODS:

From 2012 to 2014, data on the injured population were collected by physicians in on-mountain clinics in 30 French ski resorts, and interviews were conducted on the slope to sample a noninjured control population. Two sets of cases (1425 participants with TBI and 1386 with OTHI) were compared with 2 sets of controls (2145 participants without injury and 40,288 with an injury to a body part other than the head). The effect of helmet use on the risk of TBI and OTHI was evaluated with a multivariate logistic regression adjusted for age, sex, sport, skill level, crash type, and crash location.

RESULTS:

Using participants without injury as control, we found that helmet wearers were less likely to sustain any head injury (odds ratio [OR]_{TBI} = 0.65; OR_{OTHI} = 0.42). When considering participants with an injury to another body part as control, the risk of OTHI was lower among helmet wearers (OR_{OTHI}: 0.61). However, no significant effect was found for the risk of TBI. Participants with low skill levels, those aged <26 and >50 years, snowboarders, and those involved in collision and in snowpark accidents were at higher risk of head injury.

CONCLUSION:

This study confirms the effectiveness of helmets in protecting users from head injuries but questions their effects on TBI, especially concussion.

20 A. ROTATOR CUFF**Fatty infiltrate****Fatty infiltration and muscle atrophy of the rotator cuff in stemless total shoulder arthroplasty: a prospective cohort study**

Arkan S. Sayed-Noor, MD, PhD, FRCS Raymond Pollock, PhD, MPH Bassem T. Elhassan, MD
,
Bakir Kadum, MD, PhD, FEBOT, FRCS(Glagow) PhD, FEBOT, FRCS(Glagow) Bakir Kadum
DOI: <https://doi.org/10.1016/j.jse.2017.12.021>

Background

The influence of preoperative rotator cuff fatty infiltration (FI) and muscle atrophy (MA) on the postoperative outcome of total shoulder arthroplasty (TSA) has only rarely been investigated and reported in the literature. We hypothesized that more FI and MA would be associated with a worse postoperative functional outcome.

Methods

This prospective cohort study included 63 patients (31 female and 32 male patients; mean age, 71 years [range, 53-89 years; standard deviation, 7 years]) with primary osteoarthritis of the shoulder operated on with anatomic stemless TSA. Preoperatively and at 3 months and 1 year after the operation, the functional outcome (QuickDASH [short version of Disabilities of the Arm, Shoulder and Hand questionnaire] score) and range of motion (ROM) (goniometer) and strength (dynamometer) for abduction at the scapular plane and for external rotation were measured. The degree of preoperative FI and MA was evaluated using computed tomography scans according to the Goutallier classification and Warner classification, respectively, for the supraspinatus and infraspinatus.

Results

We found clinically and statistically significant improvements in functional outcome, strength, and ROM at both 3 months and 1 year of follow-up compared with those preoperatively. The Pearson correlation coefficient (r) showed significant correlations between preoperative supraspinatus and infraspinatus FI and MA and preoperative and 1-year postoperative shoulder abduction and external rotation strength but not ROM. However, we found no influence of the rotator cuff FI and MA on the functional outcome after TSA.

Conclusion

We demonstrated a significant correlation between rotator cuff FI and MA and strength but not ROM of the shoulder joint.

22 A. IMPINGEMENT**Low volume CS injections help**

European Journal of Orthopaedic Surgery & Traumatology pp 1–9l

Short-term outcomes of subacromial injection of combined corticosteroid with low-volume compared to high-volume local anesthetic for rotator cuff impingement syndrome: a randomized controlled non-inferiority trial

- Manusak Boonard Jatupon Kongtharvonskul

Background

In symptomatic tendinosis, a corticosteroid injection into the subacromial space is a palliative treatment option. This study compares high volumes (10 cc) of local anesthetic (LA) combined with triamcinolone acetate (TA) with low volumes (4 cc) of LA combined with TA to see whether the latter would provide similar pain, function and complication outcomes for subacromial injections in patients with impingement syndrome.

Materials and methods

This single-center, randomized, single-blind, non-inferiority trial included patients with shoulder pain and positive multiple clinical tests supporting the diagnosis of impingement syndrome. All 52 patients received subacromial injections, with either high-volume corticosteroid injections (HCI) (10 mL total volume of 1% lidocaine plus 40 mg TA) in 26 patients or low-volume corticosteroid injections (LCI) (4 mL total volume of 1% lidocaine plus 40 mg TA) in 26 patients. The demographic data were reported with the primary outcomes being VAS and WORC scores measured at 30 min, then 2 and 8 weeks after receiving the injections. A non-inferiority margin of 13% was assumed.

Results

Fifty-two patients (26 patients per group) were enrolled in the HCI and LCI. Mean VAS and WORC scores of HCI and LCI at baseline were 6.96, 33.85, 6.81 and 36.54, respectively. The mean VAS measured at 30 min, 2 and 8 weeks was 4.04, 2.08 and 1.20, respectively, in HCI group and 2.65, 1.95 and 1.26, respectively, in LCI group. The mean WORC at 2 and 8 weeks was 67.46 and 81.74, respectively, in HCI group and 65.42 and 80.12 in LCI group. These were not statistically significantly different ($P > 0.05$ in all).

Conclusion

Corticosteroid injections can be used in the treatment of subacromial impingement syndrome. Low-volume (4 cc) corticosteroid injections have non-inferior pain results for VAS score when compared with high-volume (10 cc) corticosteroid injections.

24. ELBOW**Tennis elbow**

March 2018 Volume 27, Issue 3, Pages 387–392

Tennis elbow: associated psychological factors

Aurelie Aben, MSc Lieven De Wilde, MD, PhD Alexander Van Tongel, MD, PhD Alexander Van Tongel

DOI: <https://doi.org/10.1016/j.jse.2017.11.033>

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Background

The etiology of tennis elbow is multifactorial. Overuse of the wrist extensors along with anatomic factors, such as flexibility problems, aging, and poor blood circulation, may play a role. This study investigated whether patients with tennis elbow have a different psychological profile compared with healthy controls.

Methods

Patients with clinical signs of tennis elbow, consulting at the Ghent University Hospital between September 2015 and January 2017, were offered a paper-and-pencil questionnaire about Big Five personality traits, perfectionism, anxiety, depression, work satisfaction, and working conditions. Healthy controls in the same risk group were offered the same questionnaires.

Results

We recruited 69 patients (35 men, 34 women) and 100 controls (44 men, 56 women). Tennis elbow patients scored significantly lower on the personality traits extraversion and agreeableness. Men, in particular, scored significantly higher on perfectionism and were more likely to develop an anxiety disorder or a depression. Concerning work, patients indicated a significantly higher workload (especially men) and a significantly lower autonomy (especially women). Female patients also indicated less contact with colleagues. However, work satisfaction was relatively high in both groups.

Conclusion

The results suggest that there is a relationship between complaints related to tennis elbow and psychological characteristics.

29. OA

Compensations

European Spine Journal pp 1–9 | Cite as

Radiological severity of hip osteoarthritis in patients with adult spinal deformity: the effect on spinopelvic and lower extremity compensatory mechanisms

- Louis M. Day Aaron J. Buckland

Purpose

Sagittal spinal deformity (SSD) patients utilize pelvic tilt (PT) and their lower extremities in order to compensate for malalignment. This study examines the effect of hip osteoarthritis (OA) on compensatory mechanisms in SSD patients.

Methods

Patients ≥ 18 years with SSD were included for analysis. Spinopelvic, lower extremity, and cervical alignment were assessed on standing full-body stereoradiographs. Hip OA severity was graded by Kellgren–Lawrence scale (0–4). Patients were categorized as limited osteoarthritis (LOA: grade 0–2) and severe osteoarthritis (SOA: grade 3–4). Patients were matched for age and T1-pelvic angle (TPA). Spinopelvic [sagittal vertical axis (SVA), T1-pelvic angle, thoracic kyphosis (TK), pelvic tilt (PT), lumbar lordosis (LL), pelvic incidence minus lumbar lordosis (PI-LL), T1-spinopelvic inclination (T1SPi)] and lower extremity parameters [sacrofemoral angle, knee angle, ankle angle, posterior pelvic shift (P. Shift), global sagittal axis (GSA)] were compared between groups using independent sample *t* test.

Results

136 patients (LOA = 68, SOA = 68) were included in the study. SOA had less pelvic tilt ($p = 0.011$), thoracic kyphosis ($p = 0.007$), and higher SVA and T1Spi ($p < 0.001$) than LOA. SOA had lower sacrofemoral angle ($p < 0.001$) and ankle angle ($p = 0.043$), increased P. Shift ($p < 0.001$) and increased GSA ($p < 0.001$) compared to LOA. There were no differences in PI-LL, LL, knee angle, or cervical alignment ($p > 0.05$).

Conclusions

Patients with coexisting spinal malalignment and SOA compensate by pelvic shift and thoracic hypokyphosis rather than PT, likely as a result of limited hip extension secondary to SOA. As a result, SOA had worse global sagittal alignment than their LOA counterparts.

31. KNEE

Hamstring strength

RESEARCH REPORT**A Novel Apparatus to Measure Knee Flexor Strength During Various Hamstring Exercises: A Reliability and Retrospective Injury Study**

Authors: Jack T. Hickey, AEP, MClinExPhys¹, Peter F. Hickey, PhD², Nirav Maniar, BExSci¹, Ryan G. Timmins, PhD¹, Morgan D. Williams, PhD³, Christian A. Pitcher, AEP, PhD¹, David A. Opar, PhD¹

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2017 **Volume:**48 **Issue:**2 **Pages:**72–80 **DOI:**10.2519/jospt.2018.7634

Study Design Reliability and case-control injury study.

Background Knee flexor strength is a key variable when dealing with hamstring strain injury (HSI), and methodologies of objective measurement of strength are often limited to single exercises.

Objectives To establish test-retest reliability of a novel apparatus to measure knee flexor strength during various hamstring exercises, and to investigate whether the measure can detect between-leg differences in male participants with and without history of unilateral HSI.

Methods

Twenty male participants without and 10 male participants with previous unilateral HSI participated. Isometric knee flexor strength and peak rate of force development (RFD) at 0°/0°, 45°/45°, and 90°/90° of hip/knee flexion were measured, as well as force impulse during bilateral and unilateral variations of an eccentric slider and hamstring bridge, using a novel apparatus. Intraclass correlation coefficient (ICC), typical error, and typical error as a coefficient of variation were calculated for all measures. The magnitudes of between-leg differences within each group were calculated using estimates of effect sizes, reported as Cohen's *d* and 90% confidence interval (CI).

Results

Moderate to high test-retest reliability was observed for isometric knee flexor strength (ICC = 0.87–0.92) and peak RFD (ICC = 0.88–0.95) across 3 positions and for mean force impulse during the eccentric slider (ICC = 0.83–0.90). In those with prior HSI, large deficits were observed in the previously injured leg compared to the contralateral uninjured leg for mean force impulse during the unilateral eccentric slider ($d = -1.09$; 90% CI: $-0.20, -1.97$), isometric strength at 0°/0° ($d = -1.06$; 90% CI: $-0.18, -1.93$) and 45°/45° ($d = -0.88$; 90% CI: $-0.02, -1.74$), and peak RFD at 45°/45° ($d = -0.88$; 90% CI: $-0.02, -1.74$).

Conclusion

The novel apparatus provides a reliable measure of isometric knee flexor strength, peak RFD, and force impulse during an eccentric slider, with deficits seen in previously injured hamstrings for these measures. *J Orthop Sports Phys Ther* 2018;48(2):72–80. Epub 26 Oct 2017. doi:10.2519/jospt.2018.7634

35. KNEE/TOTAL**Pain****The Role of Preoperative Radiologic Severity, Sensory Testing, and Temporal Summation on Chronic Postoperative Pain Following Total Knee Arthroplasty**

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Objectives: Knee osteoarthritis (KOA) can be associated with local and central sensitization. As an indicator of the central gain, facilitated temporal summation of pain (TSP) has been found in KOA patients. This facilitation is predictive of the development of chronic postoperative pain after total knee arthroplasty (TKA). Other studies have suggested hypoesthesia/hypoalgesia to thermal stimuli as a feature in KOA. This study investigated associations between preoperative TSP, thermal sensitivity, and radiologic severity for the development of chronic postoperative pain after TKA.

Methods: Radiologic KOA (Kellgren and Lawrence), TSP, and thermal stimuli were collected, preoperatively. Clinical knee pain intensity (VAS 0-10) was assessed before and 12 months following TKA. Patients were categorized into a chronic postoperative pain group if they experienced <30% pain reduction of the initial pain after 12 months.

Results: In total, 19% of the patients were categorized as chronic pain patients and presented facilitated preoperative TSP ($P<0.05$) and a trend towards increased heat pain threshold ($P=0.077$) compared with patients with normal recovery. Pearson correlations found that preoperative TSP ($R=0.193$; $P=0.013$), Kellgren and Lawrence ($R=-0.168$; $P=0.027$), warm detection threshold ($R=0.195$; $P=0.012$), and heat pain threshold ($R=0.196$; $P=0.012$) were associated with pain intensity 12 months after TKA where TSP was identified as an independent factor.

Discussion: This study showed that preoperatively facilitated TSP in KOA patients was predictive of the development of chronic postoperative pain following TKA. Furthermore, this study is the first to find an association between preoperative hypoalgesia to heat and the development of chronic postoperative pain following TKA.

42. PLANTAR SURFACE**PRP better than CS****CLINICAL AND IMAGING EFFECTS OF CORTICOSTEROIDS AND PLATELET-RICH PLASMA FOR THE TREATMENT OF CHRONIC PLANTAR FASCIITIS: A COMPARATIVE NON-RANDOMIZED PROSPECTIVE STUDY**

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Highlights

- Injections of PRP is a safe, more efficient and long-lasting method than that of corticoid injections.
- Injections of PRP produce a significant clinical improvement that is maintained in time.
- MRI and US have proven useful in assessing the response of plantar fascia injuries to nonoperative treatments.

Abstract

The purpose is to compare the effectiveness and imaging changes (US and MRI) between PRP and corticoids injections for the treatment of chronic plantar fasciitis, using clinical results evaluated by the visual analogue scale (VAS), the AOFAS clinical rating system and the modified Roles and Maudsley score, and using imaging results (US and MRI).

Our hypothesis is that PRP infiltrations are a more effective therapeutic method than infiltrations with corticosteroids. A single-centre, non randomized, prospective study of 40 consecutive patients (40 feet) with plantar fasciitis who had not responded to conservative treatment for at least 6 months was undertaken. The first 20 consecutive patients (group A) were treated with two local injections of 4 ml of a PRP concentrate. The second group of 20 patients (group B) were injected with 4 ml of 40 mg methylprednisolone. Clinical results were evaluated using a visual analogue scale (VAS), the AOFAS clinical rating system and the modified Roles and Maudsley score, with a mean follow-up of 33 months. Imaging results were evaluated by plantar US after 3 and 6 months, and MRI after 6 months. There were no complications arising from the treatment. In group A (PRP), the VAS changed from 8.25 to 1.85 and the AOFAS from 47.05 to 92.10. In group B (methylprednisolone), the VAS changed from 7.7 to 5.30 points and from 50.85 to 49.75 on the AOFAS.

In the imaging tests, the thickness of the fascia in group A changed from 7.90 mm to 4.82 mm over 3 months following the injection, maintaining this thickness in the biannual controls. In group B the change was from 8.05 mm to 6.13 mm over 3 months, increasing to 6.9 mm after 6 months. The other inflammatory signs improved in all cases, especially in group A. The treatment of chronic plantar fasciitis by two injections of PRP is a safe, more efficient and long-lasting method than corticoid injections.

44. RHUMATOID ARTHRITIS

Measuring

Microflow imaging: New Doppler technology to detect low-grade inflammation in patients with arthritis

European Radiology — | February 16, 2018

Lim AKP, et al.

The relative efficacy of microvascular imaging in detecting low-grade inflammation in arthritis in comparison to power Doppler ultrasound (PDUS) was determined. Superb microvascular imaging (SMI) was shown to be a new Doppler technique that increased conspicuity of Doppler vascularity in symptomatic joints when compared to PDUS. In patients with arthritis, this technique enabled detection of low-grade inflammation not visualised with power Doppler.

65. NEUROLOGICAL CONDITIONS

Hemi gait

Immediate synergistic effect of a trunk orthosis with joints providing resistive force and an ankle-foot orthosis on hemiplegic gait

Clinical Interventions in Aging — 1 February 12, 2018

Katsuhira J, et al.

Researchers previously developed a trunk orthosis with joints providing resistive force (TORF) to modify malalignment of the trunk and pelvis and confirmed its positive effects in stroke patients during level walking without an ankle-foot orthosis (AFO). In this current investigation, they investigated whether this trunk orthosis and an AFO had synergistic impacts during level walking in community-dwelling patients with chronic stroke. They found an increase in the gait speed of stroke patients because of the modified trunk and pelvis alignment resulting from TORF-induced increased ankle joint plantar flexion moment at the end of the single stance phase during level walking in these subjects.