

ABSTRACTS

Table of Contents

LUMBAR SPINE	Error! Bookmark not defined.
PELVIC GIRDLE	2
PELVIC ORGANS	8
VISCERA	10
THORACIC SPINE	Error! Bookmark not defined.
CERVICAL SPINE	17
CRANIUM/TMJ	20
HEADACHES	22
CONCUSSIONS	Error! Bookmark not defined.
SHOULDER GIRDLE	27
GLENOHUMERAL/SHOULDER	28
ELBOW	Error! Bookmark not defined.
WRIST AND HAND	Error! Bookmark not defined.
HIP	30
KNEE	33
FOOT AND ANKLE	Error! Bookmark not defined.
MANUAL THERAPY/STRETCHING/MUSCLES STM	42
CFS/BET	Error! Bookmark not defined.
ATHLETICS	64
RUNNING GAIT	Error! Bookmark not defined.
PAIN	68
COMPLEX REGIONAL PAIN	Error! Bookmark not defined.
FIBROMYALGIA	72
NUTRITION/VITAMINS/MEDICATION/TOPICALS	73
NEUROLOGICAL CONDITIONS	77

2. LBP

Stratification of clinical results

Risk stratification of patients with low back pain seen in physical therapy practice☆

J.R. Rodeghero C.E. Cook J.A. Cleland P.E. Mintken

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Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.04.007>

Highlights

- Demographic factors can predict both poor and good outcomes after physiotherapy.
- This exploratory study has the capacity to help modify physiotherapy intensities.
- Insurance type, duration of symptoms and past surgery are strong predictors of outcomes.

Abstract

Design

A secondary analysis of a retrospective cohort was conducted using data obtained from a commercial outcomes database.

Objective

To identify predictive characteristics related to patients with lumbar impairments who have a high risk of a bad prognosis (lowest functional recovery compared to visit utilization) as well as those who are at low risk of a bad prognosis (highest functional recovery compared to visit utilization).

Background

Lumbar impairments are highly prevalent and routinely cause people to seek medical care, including physiotherapy. Most prognostic studies focus solely on good outcomes but do not factor in the intensity of care needed to achieve the outcome. Understanding care intensity needed per outcome achieved could help assign appropriate care quantities.

Methods

Data from 6379 patients with lumbar impairments were analyzed to determine predictive characteristics that identify patients who either have a low or high risk of a bad prognosis to physiotherapy care. Multinomial regression was used to identify significant patient characteristics predictive of treatment response.

Results

Statistically significant predictors for high risk categorization included older age, longer duration of symptoms, surgical history, current use of medications, lower levels of disability at baseline, and insurance categorization. Statistically significant predictors of low risk categorization included younger age, male gender, shorter duration of symptoms, no surgical history, higher levels of disability at baseline, and insurance status.

Conclusion

Selected variables were associated with both poor and good recovery. Further research on prognosis, efficacy of physiotherapy care, and cost appear warranted for patients with lumbar impairments.

Keywords: Low back pain, Risk stratification, Physiotherapy

Stenosis evaluation

J Orthop Sci. 2015 Jun 25.

Development of a support tool for the clinical diagnosis of symptomatic lumbar intra- and/or extra-foraminal stenosis.

Yamada H¹, Oka H, Iwasaki H, Endo T, Kioka M, Ishimoto Y, Nagata K, Takiguchi N, Hashizume H, Minamide A, Nakagawa Y, Kawai M, Tsutsui S, Yoshida M.
Author information

Abstract

BACKGROUND:

Not all lumbar intra- and/or extra-foraminal stenosis (LIEFS) on MRI is symptomatic. Therefore, the establishment of clinical diagnostic tools that can identify patients with symptomatic LIEFS is crucial in the clinical setting. The aim of this study was to develop a support tool for clinical diagnosis of LIEFS.

METHODS:

Patients with L5 radiculopathy alone were prospectively enrolled. Fifty-one patients with lumbar spinal canal stenosis only at the L4-5 level and 49 patients with LIEFS only at the L5-S1 level were extracted from this cohort. We compared the two groups with regard to 12 variables—three subjective and three objective items from the Japanese Orthopaedic Association (JOA) score; Kemp's sign; results of the lumbar flexion test, Bonnet test, and Freiberg test; pain on sitting; and pain when recumbent—to determine which factors were associated with a high index of clinical suspicion of LIEFS.

RESULTS:

The significant predictors of a final diagnosis of LIEFS were identified as follows: pain when recumbent, Freiberg and Bonnet test results, and pain on sitting. To develop a diagnostic tool, a scoring system (0-20 points) was formulated on the basis of the contribution ratios of these risk factors. To determine the contribution ratio, an integer score was assigned to the identified risk factors as follows: pain when recumbent = 9 points, Freiberg = 5 points, Bonnet = 3 points, and pain on sitting = 3 points. The Hosmer-Lemeshow statistic for this scoring system was $p = 0.063$, and confirmed that it was a good model. Receiver operating characteristic (ROC) curve analysis demonstrated a cut-off value of 5 points, an area under the ROC curve of 0.87435, sensitivity of 75.5 %, and specificity of 82.3 %.

CONCLUSIONS:

We believe that the use of this tool in the clinical setting will improve the accuracy of diagnosing symptomatic LIEFS, which will lead to improved quality of patient care.

PMID: 26104220

Stenosis and neuropathic pain

Yonsei Med J. 2015 Jul;56(4):1044-50. doi: 10.3349/ymj.2015.56.4.1044.

Neuropathic Pain Components in Patients with Lumbar Spinal Stenosis.

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Abstract

PURPOSE:

To determine the prevalence and characteristics of neuropathic pain (NP) in patients with lumbar spinal stenosis (LSS) according to subgroup analysis of symptoms.

MATERIALS AND METHODS:

We prospectively enrolled subjects with LSS (n=86) who were scheduled to undergo spinal surgery. The patients were divided into two groups according to a chief complaint of radicular pain or neurogenic claudication. We measured patient's pain score using the visual analog scale (VAS), Oswestry Disability Index (ODI) and Leads Assessment of Neuropathic Symptoms and Signs (LANSS). According to LANSS value, the prevalence of NP component pain in patients with LSS was assessed. Statistical analysis was performed to find the relationship between LANSS scores and the other scores.

RESULTS:

From our sample of 86 patients, 31 (36.0%) had a NP component, with 24 (63.4%) in the radicular pain group having NP. However, only seven patients (15.6%) in the neurogenic claudication group had NP. The LANSS pain score was not significantly correlated with VAS scores for back pain, but did correlate with VAS scores for leg pain (R=0.73, p<0.001) and with ODI back pain scores (R=0.54, p<0.01).

CONCLUSION:

One-third of the patients with LSS had a NP component. The presence of radicular pain correlated strongly with NP. The severity of leg pain and ODI score were also closely related to a NP component. This data may prove useful to understanding the pain characteristics of LSS and in better designing clinical trials for NP treatment in patients with LSS.

KEYWORDS: Leads Assessment of Neuropathic Symptoms and Signs; Neuropathic pain; Oswestry Disability Index; spinal stenosis; visual analog scale
PMID: 26069129

LBP and obesity

Eur Spine J. 2015 Jun 18.

Are obesity and body fat distribution associated with low back pain in women? A population-based study of 1128 Spanish twins.

Dario AB¹, Ferreira ML, Refshauge K, Sánchez-Romera JF, Luque-Suarez A, Hopper JL, Ordoñana JR, Ferreira PH.

Author information

Abstract**PURPOSE:**

To investigate the relationship between different measures of obesity and chronic low back pain (LBP) using a within-pair twin case-control design that adjusts for genetics and early shared environment.

METHODS:

A cross-sectional association between lifetime prevalence of chronic LBP and different measures of obesity (body mass index-BMI; percent body fat; waist circumference; waist-hip ratio) was investigated in 1128 female twins in three stages: (i) total sample analysis; (ii) within-pair case-control analysis for monozygotic (MZ) and dizygotic (DZ) twins together; (iii) within-pair case-control analysis separated by DZ and MZ. Odds ratios (OR) and 95 % confidence intervals (CI) were calculated.

RESULTS:

BMI (OR 1.12; 95 % CI 1.02-1.26) and percent body fat (OR 1.15; 95 % CI 1.01-1.32) were weakly associated with lifetime prevalence of chronic LBP in the total sample analysis but were absent when shared environment and genetic factors were adjusted for using the within-pair case-control analysis. Greater waist-hip ratios were associated with smaller prevalence estimates of chronic LBP in the within-pair case-control analysis with both MZ and DZ twins (OR 0.67; 95 % CI 0.47-0.94). However, this association did not remain after the full adjustment for genetic factors in the MZ within-pair case-control analysis.

CONCLUSIONS:

BMI, percent of fat mass and greater depositions of fat and mass around the hips are associated with increases in chronic LBP prevalence in women but these associations are small and appear to be confounded by the effects of genetics and early shared environment. Therefore, our results do not support a causal direct relationship between obesity and chronic LBP.

PMID: 26084786

HGH and Testosterone

HGH and testosterone for back pain

Journal of Pain Research, 07/07/2015

Dubick MN, et al.

The objective of this case series was to investigate the feasibility and safety of a novel method for the management of chronic lower back pain. The intervention appeared to be safe and the results provide a reasonable expectation that the intervention would be beneficial for a population of individuals with chronic nonradicular lower back pain. Due to the design of the study, causality cannot be inferred, but the results do indicate that further study of the intervention may be warranted.

Methods

- This is a case series involving consecutive patients with chronic lower back pain who received the intervention of injections of recombinant human growth hormone and testosterone, and attended chiropractic and/or physical therapy.
- Outcomes were measured at 12 months from the time of injection.
- A community based hospital affiliated office, and a private practice block suite.
- A total of 60 consecutive patients attending a pain management practice for chronic lower back pain were recruited for the experimental treatment.
- Most participants were private pay.
- Participants who provided informed consent and were determined not to have radicular pain received diagnostic blocks.
- Those who responded favorably to the diagnostic blocks received injections of recombinant human growth hormone and testosterone in the areas treated with the blocks.
- Participants also received manipulation- and impairment-based exercises.
- Outcomes were assessed at 12 months through pain ratings with the Mankowski Pain Scale and the Oswestry Disability Index.

Results

- Of the 60 patients recruited, 49 provided informed consent, and 39 completed all aspects of the study.
- Those patients receiving the intervention reported a significant decrease in pain ratings ($P < 0.01$) and a significant improvement in self-rated Oswestry Disability Index scores ($P < 0.01$).
- In addition, in the Oswestry Disability Index results, 41% of the patients demonstrated a 50% or greater change in their disability score.
- Of the subjects who withdrew from the study, one was due to the pain created by the injections and nine were for nonstudy factors.

PT for pt with Kinesiophobia

Phys Ther. 2015 Apr 30.

Does Kinesiophobia Modify the Effects of Physical Therapy on Outcomes in Patients With Sciatica in Primary Care? Subgroup Analysis From a Randomized Controlled Trial.

Verwoerd AJ¹, Luijsterburg PA², Koes BW³, El Barzouhi A⁴, Verhagen AP⁵.
Author information

Abstract

BACKGROUND:

A higher level of kinesiophobia appears to be associated with poor recovery in patients with sciatica.

OBJECTIVE:

The aim of this study was to investigate if kinesiophobia modifies the effect of physical therapy on outcome in patients with sciatica.

DESIGN:

This was a subgroup analysis from a randomized controlled trial.

SETTING:

The study was conducted in a primary care setting.

PATIENTS:

A total of 135 patients with acute sciatica participated.

INTERVENTION:

Patients were randomly assigned to groups that received (1) physical therapy plus general practitioners' care (intervention group) or (2) general practitioners' care alone (control group).

MEASUREMENTS:

Kinesiophobia at baseline was measured with the Tampa Scale for Kinesiophobia (TSK) and a single substitute question for kinesiophobia (SQK). Pain and recovery were assessed at 3- and 12-month follow-ups. Regression analysis was used to test for interaction between the level of kinesiophobia at baseline and treatment allocation. Subgroup results were calculated for patients classified with high fear of movement and for those classified with low fear of movement.

RESULTS:

Kinesiophobia at baseline interacted with physical therapy in the analysis with leg pain intensity at 12-month follow-up. Kinesiophobia at baseline did not interact with physical therapy regarding any outcome at 3-month follow-up or recovery at 12-month follow-up. When comparing both treatment groups in the subgroup of patients with high fear of movement (n=73), the only significant result was found for leg pain intensity difference from baseline at 12-month follow-up (intervention group: \bar{X} =-5.0, SD=2.6; control group: \bar{X} =-3.6, SD=2.7).

LIMITATIONS:

The post hoc study design and relatively small sample size were limitations of the study.

CONCLUSIONS:

In these patients with sciatica, the study provides preliminary evidence that patients with a higher level of kinesiophobia at baseline may particularly benefit from physical therapy with regard to decreasing leg pain intensity at 12-month follow-up.

PMID:25929529

3. DISC

Disc degeneration

Spine (Phila Pa 1976). 2015 Apr 17.

Dysregulated COL3A1 and RPL8, RPS16, RPS23 in Disc Degeneration Revealed by Bioinformatics Methods.

Yang Z¹, Chen X, Zhang Q, Cai B, Chen K, Chen Z, Bai Y, Shi Z, Li M.
Author information

Abstract

STUDY DESIGN:

Bioinformatics analysis of published microarray data.

OBJECTIVE:

This study aimed to reveal the possible genes and pathways related to the pathogenesis of DD by analyzing the microarray data.

SUMMARY OF BACKGROUND DATA:

Disc degeneration (DD) is one of the main causes of low back pain, which has become an enormous economic burden for society.

METHODS:

Gene expression data of annulus cells and nucleus pulposus cells from DD patients and controls subjects were downloaded from Gene Expression Omnibus. T-test and enrichment analysis were used to identify differentially expressed genes (DEGs) and DEGs-associated functions and pathways in DD respectively. Protein-protein interaction network and module were constructed to analyze the key nodes associated with this disease.

RESULTS:

Totally 326 DEGs and 35 DEGs were obtained from the annulus cells and nucleus pulposus cells, respectively. The DEGs of DD in annulus cells were mainly involved in translation, cell adhesion, cell death regulation and skeletal system development whilst the DEGs in nucleus pulposus cells were mainly related to the biological processes of vascular system development, skeletal system development and enzyme-linked receptor protein signaling pathway. COL3A1 was the common DEGs in both annulus cells and nucleus pulposus cells. The ribosomal proteins (RPL8, RPS16 and RPS23) in module were enriched in biological processes of translation, translation elongation and RNA processing.

CONCLUSION:

The results revealed the involvement of COL3A1 in skeletal system process and RPL8, RPS16 and RPS23 in the protein synthesis processes in the progression of DD, suggesting their potential use in the diagnosis and therapy of DD.

PMID: 25893343

Anti-inflammatory and disc

Spine (Phila Pa 1976). 2015 Apr 14.

Inflammatory Kinetics and Efficacy of Anti-inflammatory Treatments on Human Nucleus Pulposus Cells.

Walter BA¹, Purmessur D, Likhitpanichkul M, Weinberg A, Cho SK, Qureshi SA, Hecht AC, Iatridis JC.
Author information

Abstract

STUDY DESIGN:

Human nucleus pulposus (NP) cell culture study investigating response to tumor necrosis factor- α (TNF α), effectiveness of clinically available anti-inflammatory drugs, and interactions between pro-inflammatory cytokines.

OBJECTIVE:

To characterize the kinetic response of pro-inflammatory cytokines released by human NP cells to TNF α stimulation and the effectiveness of multiple anti-inflammatories with 3 sub-studies: Timecourse, Same-time blocking, Delayed blocking.

SUMMARY OF BACKGROUND DATA:

Chronic inflammation is a key component of painful intervertebral disc (IVD) degeneration. Improved efficacy of anti-inflammatories requires better understanding of how quickly NP cells produce pro-inflammatory cytokines and which pro-inflammatory mediators are most therapeutically advantageous to target.

METHODS:

Degenerated human NP cells (n = 10) were cultured in alginate with or without TNF α (10ng/mL). Cells were incubated with one of four anti-inflammatories (anti-IL-6 receptor/atlizumab, IL-1 receptor antagonist, anti-TNF α /inliximab and sodium pentosan polysulfate/PPS) in two blocking-studies designed to determine how intervention timing influences drug efficacy. Cell viability, protein and gene expression for IL-1 β , IL-6 & IL-8 were assessed.

RESULTS:

Timecourse: TNF α substantially increased the amount of IL-6, IL-8 & IL-1 β , with IL-1 β and IL-8 reaching equilibrium within ~72 hours (IL-1 β : 111 \pm 40pg/mL, IL-8: 8478 \pm 957pg/mL), and IL-6 not reaching steady state after 144 hours (1570 \pm 435 pg/mL). Anti-TNF α treatment was most effective at reducing the expression of all cytokines measured when added at the same time as TNF α stimulation. Similar trends were observed when drugs were added 72 hours after TNF α stimulation, however, no anti-inflammatories significantly reduced cytokine levels compared to TNF control.

CONCLUSION:

IL-1 β , IL-6 and IL-8 were expressed at different rates and magnitudes suggesting different roles for these cytokines in disease. Autocrine signaling of IL-6 or IL-1 β did not contribute to the expression of any pro-inflammatory cytokines measured in this study. Anti-inflammatory treatments were most effective when applied early in the inflammatory process, when targeting the source of the inflammation.

PMID: 25893355

4. INJECTIONS

Impact on stenosis

Spine J. 2015 Jun 18. pii: S1529-9430(15)00637-3. doi: 10.1016/j.spinee.2015.06.050.

Can Patient Characteristics Predict Benefit from Epidural Corticosteroid Injections for Lumbar Spinal Stenosis Symptoms?

Turner JA¹, Comstock BA², Standaert C³, Heagerty PJ², Jarvik JG⁴, Deyo RA⁵, Wasan AD⁶, Nedeljkovic SS⁷, Friedly JL³.

Author information

Abstract

BACKGROUND CONTEXT: Epidural corticosteroid injections are commonly used to treat back and leg pain associated with lumbar spinal stenosis. However, little is known about which patient characteristics may predict favorable responses.

PURPOSE: To identify patient characteristics associated with benefits from epidural injections of corticosteroid with lidocaine versus epidural injections of lidocaine only for lumbar spinal stenosis symptoms.

STUDY DESIGN: Secondary analysis of LESS randomized controlled trial data.

SETTING: 16 US clinical sites.

PATIENT SAMPLE: Patients > 50 years with moderate-to-severe leg pain and lumbar central spinal stenosis randomized to epidural injections of corticosteroids with lidocaine (n = 200) or lidocaine only (n = 200).

OUTCOME MEASURES: Primary outcomes were the Roland-Morris Disability Questionnaire (RMDQ) and 0-10 leg pain intensity ratings. Secondary outcomes included the Brief Pain Inventory Interference Scale and the Swiss Spinal Stenosis Questionnaire.

METHODS: At baseline, clinicians rated severity of patient spinal stenosis and patients completed predictor and outcome measures. Patients completed outcome measures again 3 and 6 (primary endpoint) weeks after randomization/initial injection. Analysis of covariance was used with treatment by covariate interactions to identify baseline predictors of greater benefit from corticosteroid + lidocaine versus lidocaine alone. We also identified nonspecific (independent of treatment) predictors of outcomes. The study was supported by Agency for Healthcare Research and Quality (AHRQ) grants 1R01HS019222-01 and 1R01HS022972-01, and Patient-Centered Outcomes Research Institute (PCORI) contract CE-12-11-4469. The authors report no study-related conflicts of interest.

RESULTS: Among 21 candidate predictors and 6 outcomes, only one baseline variable predicted greater benefit from corticosteroid + lidocaine versus lidocaine only at 3 or 6 weeks. Compared to patients who rated their health-related quality of life as high on the EQ-5D Index, patients who rated it as poor had greater improvement with corticosteroid than with lidocaine only in leg pain at 6 (but not 3) weeks (interaction coefficient = 2.94; 95% CI = 0.11, 5.76; p = 0.04) and in RMDQ disability scores at 3 (but not 6) weeks (interaction coefficient = 4.77, 95% CI = -0.04, 9.59; p = 0.05). Several baseline patient characteristics predicted outcomes regardless of treatment assignment.

CONCLUSIONS: Among 21 baseline patient characteristics examined, none, including clinician-rated spinal stenosis severity, were consistent predictors of benefit from epidural injections of lidocaine + corticosteroid versus lidocaine only.

KEYWORDS: back pain; corticosteroid; epidural steroid injections; leg pain; lumbar spinal stenosis; predictors; treatment effect modifiers

PMID:26096484

6. PELVIC GIRDLE

Pregnancy related pelvic pain

Disturbed body perception, reduced sleep, and kinesiophobia in subjects with pregnancy-related persistent lumbopelvic pain and moderate levels of disability: An exploratory study

Darren Beales Alison Lutz Judith Thompson Benedict Martin Wand Peter O'Sullivan

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.04.016>

- This study profiled subjects with pregnancy-related, persistent lumbopelvic pain.
- Those with moderate disability had altered body perception, kinesiophobia and sleep impairment.
- Disability level was not related to mindfulness.

Abstract

Background

For a small but significant group, pregnancy-related lumbopelvic pain may become persistent. While multiple factors may contribute to disability in this group, previous studies have not investigated sleep impairments, body perception or mindfulness as potential factors associated with disability post-partum.

Objectives

To compare women experiencing no pain post-pregnancy with those experiencing pregnancy-related persistent lumbopelvic pain (either low- or high-level disability) across multiple biopsychosocial domains.

Design

Cross-sectional.

Methods

Participants completed questionnaires for thorough profiling of factors thought to be important in pregnancy-related lumbopelvic pain. Specific measures were the Urinary Distress Inventory, Medical Outcomes Study Sleep Scale, Back Beliefs Questionnaire, Tampa Scale for Kinesiophobia, Depression Anxiety Stress Scale, Coping Strategies Questionnaire, Pain Catastrophising Scale, The Fremantle Back Awareness Questionnaire and the Mindful Attention Awareness Scale. Women were categorised into three groups; pain free (n = 26), mild disability (n = 12) and moderate disability (n = 12) (based on Oswestry Disability Index scores). Non-parametric group comparisons were used to compare groups across the profiling variables.

Results

Differences were identified for kinesiophobia (p = 0.03), body perception (p = 0.02), sleep quantity (p < 0.01) and sleep adequacy (p = 0.02). Generally subjects in the moderate disability group had more negative findings for these variables.

Conclusion

Disturbances in body-perception, sleep and elevated kinesiophobia were found in pregnancy-related lumbopelvic pain subjects with moderate disability, factors previously linked to persistent low back pain. The cross-sectional nature of this study does not allow for identification of directional pathways between factors. The results support the consideration of these factors in the assessment and management of pregnancy-related lumbopelvic pain.

Keywords: Pregnancy, Pelvic girdle pain, Fear, Sleep, Body image

Innominate motions**Innominate movement patterns, rotation trends and range of motion in individuals with low back pain of sacroiliac joint origin**

Divya Bharatkumar Adhia¹ Stephan Milosavljevic¹ Steve Tumilty¹ Melanie D. Bussey

- Innominate kinematics comparison between SIJ-positive & SIJ-negative individuals.
- SIJ pain individuals predominantly exhibit unilateral innominate movement patterns.
- SIJ pain individuals exhibit significantly different innominate trends of rotation.
- No significant between-group differences in innominate ranges of motion.
- Demonstrates association between innominate kinematic anomalies and SIJ pain.

Abstract

Background

Innominate kinematic anomalies resulting in low back pain (LBP) of sacroiliac joint (SIJ) origin (SIJ-positive), has always been a topic of contention, owing to difficulty in its evaluation. Recent technique of electromagnetic palpation-digitization has been able to accurately quantify innominate kinematics in healthy individuals.

Objectives

The purpose of this study is to determine if participants with LBP of SIJ origin (SIJ-positive) demonstrate significantly different innominate kinematics than participants with LBP of non-SIJ origin (SIJ-negative).

Design

Single-blinded cross-sectional case-control study.

Method

Participants [n(122)] between the ages of 18 to 50 years, suffering from chronic non-specific LBP (≥ 3 months) volunteered in the study. An experienced musculoskeletal physiotherapist evaluated and classified participants into either SIJ-positive [n(45)] or SIJ-negative [n(77)] group, using the reference standard pain provocation tests [≥ 3 positive tests = SIJ-positive]. A research physiotherapist, blinded to clinical groups, conducted the innominate kinematic testing using a valid and reliable electromagnetic palpation-digitization technique, during prone lying incremental hip abduction-external rotation test positions.

Results

The results of the mixed model regression analyses demonstrated that SIJ-positive participants exhibited significantly different innominate movement patterns and trends of rotation, but not innominate ranges of motion, when compared with SIJ-negative LBP participants.

Conclusions

These findings demonstrate association between SIJ pain and altered innominate kinematics, and have led the groundwork for further exploration of clinical measurement, relevance, and management of these potentially important movement observations.

Keywords: Sacroiliac joint, Low back pain, Biomechanics, Range of motion

Sacral innervation

Eur Spine J. 2015 Jun 16.

Neural innervation patterns in the sacral vertebral body.

Degmetich S¹, Bailey JF, Liebenberg E, Lotz JC.
Author information

Abstract

PURPOSE:

To characterize the distribution of nerves within a single S1 vertebral body, with particular emphasis on the superior endplate that interfaces with the L5/S1 disc.

METHODS:

Musculature and connective tissue surrounding the sacrum was carefully dissected away for close visual inspection of penetrating nerve fibers. The S1 vertebral body was then isolated for histology and serial coronal sections were cut and stained with a ubiquitous neural antibody marker (PGP 9.5). Slides were analyzed and nerves were manually marked on high resolution, composite captured images, rendering 3D depictions of internal nerve distribution.

RESULTS:

The vast majority of nerves were closely associated with blood vessels within the marrow space with a uniform distribution in both the superior and inferior endplates of the S1 vertebral body. The highest nerve density was seen at the centrum (anatomic center) of the S1 vertebral body with smaller peaks seen at the lateral borders. Nerve fibers were observed branching from anterior sacral nerves and penetrating the lateral border of the S1 (during dissection), corresponding with peaks on nerve density maps.

CONCLUSIONS:

Our results demonstrate that the S1 body and endplate are densely innervated and the peak in nerve density at the vertebral center coincides with vasculature patterns previously described in lumbar vertebral bodies. In the sacrum, however, there is no posterior nutrient foramen that facilitates nerve penetration through the vertebral cortex. Rather, our data indicate that nerves penetrate the S1 via the lateral aspects, consistent with being branches of the anterior sacral nerve. Since PGP 9.5 is a ubiquitous neural marker these identified nerves are likely composed of a mixed population of nociceptive and autonomic fibers.

PMID:26077098

7. PELVIC ORGANS

Painful sex

Coping with painful sex: Development and initial validation of the CHAMP Sexual Pain Coping Scale

Scandinavian Journal of Pain, 07/10/2015 Flink IK, et al.

The purpose of this study was to explore coping strategies in women with recurrent vulvar pain to develop a measure to assess how women with this pain cope with sexual activities. The results of this study support the CHAMP Sexual Pain Coping Scale (CSPCS) as an instrument for assessing how women with vulvar pain cope with sexual activities. The strategies endurance, avoidance, and alternative coping correspond with findings from earlier research.

Methods

- This study was based on a subsample from a longitudinal study about vulvar pain in a student sample of women between 18 and 35 years old (n=964).
- For the purpose of this study, data from women reporting recurrent vulvar pain during the last 6 months (n=289) were used in the analyses.
- First, the CHAMP CSPCS was created, with the aim of assessing how women with vulvar pain cope with sexual activities.
- The scale utilized previous research on women with vulvar pain and well-known coping strategies in other pain populations.
- Second, the psychometric properties of the scale were explored by analyzing the factor structure and internal reliability.
- Third, validity features were examined in terms of criterion validity and construct validity.

Results

- The analyses supported a three-factor solution, embracing the strategies endurance, avoidance, and alternative coping.
- The internal reliability of the subscales was good, and the criterion validity was supported for all three subscales.
- The construct validity was supported for the endurance and the avoidance subscales, but not for the alternative coping subscale.

8. VISCERA

Ulcerative colitis

Dig Dis Sci. 2015 Jul 4.

Ulcerative Colitis Symptomatology and Depression: The Exacerbator Role of Maladaptive Psychological Processes.

Trindade IA¹, Ferreira C, Pinto-Gouveia J.
Author information

Abstract

BACKGROUND:

Several studies have indicated that depressive symptomatology plays a pertinent role in the clinical recurrences of ulcerative colitis (UC). Due to the self-perpetuating cycle between UC symptomatology and depressive mood, it is considered that more investment should be given to the study of factors that influence depressive symptomatology in UC patients.

AIMS:

This study aimed therefore at analyzing the exacerbator effect of maladaptive psychological strategies, such as cognitive fusion and brooding, on the relationship between UC symptomatology and depressive symptoms.

METHODS:

The sample of the current study included 84 Portuguese patients with UC that completed an Internet-based survey (comprising demographic and medical questions, and self-report measures of depression, cognitive fusion, and brooding).

RESULTS:

Results showed that UC symptomatology explained 21 % of depression severity's variance. In addition, a significant interaction between UC symptomatology and cognitive fusion was found and explained 50 % of depressive symptoms' severity. A similar interaction was revealed between UC symptomatology and brooding, which accounted for 42 % of depression's variance. These findings demonstrated that, for the same level of UC symptomatology, those participants who revealed more cognitive fusion or more brooding presented significant higher levels of depression.

CONCLUSIONS:

The present study revealed cognitive fusion and brooding as moderators that exacerbate the impact of UC symptomatology on reported levels of depression. Psychological interventions that focus on the promotion of adaptive emotion regulation strategies to deal with adverse and stressful events should therefore be developed and implemented in UC patients' health care.

PMID:26141631

High protein breakfast

Int J Obes (Lond). 2015 Jun 1. doi: 10.1038/ijo.2015.101.

A pilot study examining the effects of consuming a high-protein vs normal-protein breakfast on free-living glycemic control in overweight/obese 'breakfast skipping' adolescents.

Bauer LB¹, Reynolds LJ², Douglas SM³, Kearney ML³, Hoertel HA³, Shafer RS³, Thyfault JP⁴, Leidy HJ⁵.

Author information

Abstract

To examine whether the daily consumption of normal-protein (NP) vs higher-protein (HP) breakfasts improve free-living glycemic control in overweight/obese, 'breakfast skipping' adolescents.

Twenty-eight healthy, but overweight, teens (age: 19±1 year; BMI: 29.9±0.8 kg m⁻²) completed a 12-week randomized parallel-arm study in which the adolescents consumed either a 350 kcal NP breakfast (13 g protein) or HP breakfast (35 g protein). Pre- and post-study 24-h blood glucose measures were assessed using continuous glucose monitoring. Although no main effects of time or group were detected, time by group interactions were observed. Post hoc pairwise comparisons assessing the post-pre changes revealed that the daily consumption of the HP breakfasts tended to reduce the 24-h glucose variability (s.d.) vs NP (-0.17±0.09 vs +0.09±0.10 s.d.; P=0.06) and tended to reduce the time spent above the high glucose limit (-292±118 vs -24±80 min; P=0.09). The consumption of the HP breakfasts also reduced the 24-h maximal (peak) glucose response (-0.94±0.36 vs +0.30±0.18 mmol l⁻¹; P<0.01) and reduced postprandial glucose fluctuations (-0.88±0.44 vs +0.49±0.34 mmol l⁻¹; P<0.03) vs NP.

These data suggest that the daily addition of a HP breakfast, containing 35 g of high-quality protein, has better efficacy at improving free-living glycemic control compared with a NP breakfast in overweight/obese, but otherwise healthy, 'breakfast skipping' adolescents. International Journal of Obesity advance online publication, 7 July 2015; doi:10.1038/ijo.2015.101.

PMID: 26028058

10 A. CERVICAL SPINE**Sleep and neck pain**

Clin J Pain. 2014 Aug 28.

Patients with Neck Pain are Less Likely to Improve if They Suffer from Poor Sleep Quality. A Prospective Study in Routine Practice.

Kovacs FM¹, Seco J, Royuela A, Melis S, Sánchez C, Díaz-Arribas MJ, Meli M, Núñez M, Rodríguez ME, Fernández C, Gestoso M, Mufraggi N, Moyá J, Rodríguez-Pérez V, Torres-Unda J, Burgos-Alonso N, Gago-Fernández I, Abaira V.

Author information

Abstract

OBJECTIVE:

To assess whether sleep quality (SQ) at baseline is associated with improvement in pain and disability at three months.

METHODS:

422 subacute and chronic patients with neck pain (NP) were recruited in 32 physiotherapy, primary care and specialized centers. NP, referred pain, disability, catastrophizing, depression and SQ were assessed through validated questionnaires, upon recruitment and 3 months later. Correlations between baseline scores were calculated through the Spearman's coefficient. Improvements in NP, disability and SQ were defined as a reduction $\geq 30\%$ of baseline score. Six estimative logistic regression models were developed to assess the association between baseline SQ and improvement of NP, baseline SQ and improvement of disability, baseline NP and improvement of SQ, baseline disability and improvement of SQ, the evolutions of NP and SQ, and the evolutions of disability and SQ.

RESULTS:

Most patients were subacute and mildly impaired. Regression models showed that: better SQ at baseline is associated with improvement of NP (OR [95%CI]=0.91 [0.83:0.99]), but not disability (1.04 [0.95;1.13]); the improvement of SQ is associated with more severe NP at baseline (1.26 [1.07;1.49]), but not with baseline disability (0.99 [0.97;1.02]); and that improvement in SQ is associated with improvements in NP (3.48 [1.68; 7.20]), and disability (5.02 [2.39;10,11]).

DISCUSSION:

Neck pain is less likely to improve in patients with poorer sleep quality, irrespective of age, sex, catastrophizing, depression or treatments prescribed for NP. Future studies should confirm these results with more severely impaired patients.

PMID:25171635

Degenerative cervical myelopathy

Spine (Phila Pa 1976). 2015 Jun 15;40(12):E675-93. doi: 10.1097/BRS.0000000000000913.

Degenerative Cervical Myelopathy: Epidemiology, Genetics, and Pathogenesis.

Nouri A¹, Tetreault L, Singh A, Karadimas SK, Fehlings MG.
Author information

Abstract

STUDY DESIGN:

Review.

OBJECTIVE:

To formally introduce "degenerative cervical myelopathy" (DCM) as the overarching term to describe the various degenerative conditions of the cervical spine that cause myelopathy. Herein, the epidemiology, pathogenesis, and genetics of conditions falling under this hypernym are carefully described.

SUMMARY OF BACKGROUND DATA:

Nontraumatic, degenerative forms of cervical myelopathy represent the commonest cause of spinal cord impairment in adults and include cervical spondylotic myelopathy, ossification of the posterior longitudinal ligament, ossification of the ligamentum flavum, and degenerative disc disease. Unfortunately, there is neither a specific term nor a specific diagnostic International Classification of Diseases, Tenth Revision code to describe this collection of clinical entities. This has resulted in the inconsistent use of diagnostic terms when referring to patients with myelopathy due to degenerative disease of the cervical spine.

METHODS:

Narrative review.

RESULTS:

The incidence and prevalence of myelopathy due to degeneration of the spine are estimated at a minimum of 41 and 605 per million in North America, respectively. Incidence of cervical spondylotic myelopathy-related hospitalizations has been estimated at 4.04/100,000 person-years, and surgical rates seem to be rising. Pathophysiologically, myelopathy results from static compression, spinal malalignment leading to altered cord tension and vascular supply, and dynamic injury mechanisms. Occupational hazards, including transportation of goods by weight bearing on top of the head, and other risk factors may accelerate DCM development. Potential genetic factors include those related to MMP-2 and collagen IX for degenerative disc disease, and collagen VI and XI for ossification of the posterior longitudinal ligament. In addition, congenital anomalies including spinal stenosis, Down syndrome, and Klippel-Feil syndrome may predispose to the development of DCM.

CONCLUSION:

Although DCMs can present as separate diagnostic entities, they are highly interrelated, frequently manifest concomitantly, present similarly from a clinical standpoint, and seem to be in part a response to compensate and improve stability due to progressive age and wear of the cervical spine. The use of the term "degenerative cervical myelopathy" is advocated.

LEVEL OF EVIDENCE: 5. PMID: 25839387

Pain education and exercise work together**Pain education combined with neck- and aerobic training is more effective at relieving chronic neck pain than pain education alone - A preliminary randomized controlled trial**

K. Brage I. Ris D. Falla K. Sjøgaard B. Juul-Kristensen

Received: September 29, 2014; Received in revised form: June 4, 2015; Accepted: June 12, 2015; Published Online: June 24, 2015

DOI: <http://dx.doi.org/10.1016/j.math.2015.06.003>**Highlights**

- Pain education and specific training reduce neck pain more than pain education
- Specific neck exercises reduce sternocleidomastoid activity in the CCFT
- Reduced sway length seem to follow this combined intervention

Abstract**Objective**

To evaluate the effect of training and pain education versus pain education alone, on neck pain, neck muscle activity and postural sway in patients with chronic neck pain.

Methods

Twenty women with chronic neck pain were randomized to receive pain education and specific training (neck-shoulder exercises, balance and aerobic training) (INV), or pain education alone (CTRL). Effect on neck pain, function and Global Perceived Effect (GPE) were measured.

Surface electromyography (EMG) was recorded from neck flexor and extensor muscles during performance of the Cranio-Cervical Flexion Test (CCFT) and three postural control tests (two-legged: eyes open and closed, one-legged: eyes open). Sway parameters were calculated.

Results

Fifteen participants (CTRL: eight; INV: seven) completed the study. Per protocol analyses showed a larger pain reduction ($p=0.002$) for the INV group with tendencies for increased GPE ($p=0.06$), reduced sternocleidomastoid activity during the CCFT ($p=0.09$), reduced sway length ($p=0.09$), and increased neck extensor activity ($p=0.02$) during sway compared to the CTRL group.

Conclusion

Pain education and specific training reduce neck pain more than pain education alone in patients with chronic neck pain. These results provide encouragement for a larger clinical trial to corroborate these observations.

Keywords: neck pain, electromyography, physiotherapy, cranio-cervical flexion

13. CRANIUM/TMJ

Chronic TMJ's

Manual Therapy

Validation of clinical tests for patients with long-lasting painful temporomandibular disorders with anterior disc displacement without reduction★

Elisabeth Heggem Julsvoll, MSc, RPT, MT Nina Kjøpke Vøllestad, PhD Hilde Stendal Robinson, PhD, RPT, MT

- A cluster of 7 clinical tests (5 positive) is suitable to reveal ADDWOR in TMD patients
- The cluster of tests has sensitivity of 71% and specificity of 91%
- The dental stick test has equal sensitivity as the cluster, but lower specificity
- The tests are easy to perform and suitable for use in clinical settings
- MRI; a supplement to clinical tests, not a necessity to start treatment

Abstract

Objective

To evaluate the validity of single clinical tests and cluster of tests used to identify anterior disc displacement without reduction (ADDWOR).

Methods

Treatment-seeking patients with temporomandibular pain and limited mouth-opening were recruited among patients from health-professionals in the region of Oslo in 2012. Thirty-five persons, aged 18–70 years, with 58 symptomatic joints or pain in surrounding area were included. The examinations were performed by one experienced manual therapist. Magnetic resonance imaging (MRI) was used as reference standard. Sensitivity, specificity, false positive, false negative and likelihood-ratios (LRs) with 95% confidence intervals (CIs) were calculated for single and cluster of tests. ROC analysis were used to see how well pain provocation tests discriminated between positive and negative ADDWOR.

Results

The main result is that a cluster of 7 clinical tests (5 positive) can be used to diagnose ADDWOR with an accuracy of 71%. The dental stick test is the best single test with equal sensitivity as the cluster, but with lower specificity.

Conclusion

To reveal ADDWOR in patients with TMD, we recommend using the cluster of the dental stick test, the isometric test, the joint provocation test, the joint sound test, the deviation test, the laterotrusion test and joint mobility test.

Practice and implications

The tests require no advanced equipment, they are easy to perform and suitable for use in clinical settings. MRI can be seen as more of a supplement to the clinical tests than a necessity to start a clinical intervention.

Keywords: Temporomandibular disorders - TMD, Anterior disc displacement without reduction - ADDWOR, Clinical tests, Validity

Manual therapy and TMJ**Efficacy of musculoskeletal manual approach in the treatment of temporomandibular joint disorder: A systematic review with meta-analysis**

Wagner Rodrigues Martins Juscelino Castro Blasczyk Micaele Aparecida Furlan de Oliveira²,
 Karina Ferreira Lagôa Gonçalves³ Ana Clara Bonini-Rocha⁴ Pierre-Michel Dugailly,
 Ricardo Jacó de Oliveira⁵

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.06.009>

- Musculoskeletal manipulations approaches are effective for the treatment of TMJ.
- There is a larger effect for MMA compared to other conservative treatments.
- MMA have biomechanical and neurophysiological effects for the treatment of TMJ.

Abstract

Background

Temporomandibular joint disorder (TMD) requires a complex diagnostic and therapeutic approach, which usually involves a multidisciplinary management. Among these treatments, musculoskeletal manual techniques are used to improve health and healing.

Objectives

To assess the effectiveness of musculoskeletal manual approach in temporomandibular joint disorder patients.

Design

A systematic review with meta-analysis.

Methods

During August 2014 a systematic review of relevant databases (PubMed, The Cochrane Library, PEDro and ISI web of knowledge) was performed to identify controlled clinical trials without date restriction and restricted to the English language. Clinical outcomes were pain and range of motion focalized in temporomandibular joint. The mean difference (MD) or standard mean difference (SMD) with 95% confidence intervals (CIs) and overall effect size were calculated at every post treatment. The PEDro scale was used to demonstrate the quality of the included studies.

Results/findings

From the 308 articles identified by the search strategy, 8 articles met the inclusion criteria. The meta-analysis showed a significant difference ($p < 0.0001$) and large effect on active mouth opening (SMD, 0.83; 95% CI, 0.42 to 1.25) and on pain during active mouth opening (MD, 1.69; 95% CI, 1.09 to 2.30) in favor of musculoskeletal manual techniques when compared to other conservative treatments for TMD.

Conclusions

Musculoskeletal manual approaches are effective for treating TMD. In the short term, there is a larger effect regarding the latter when compared to other conservative treatments for TMD.

Keywords: Temporomandibular joint disorder, Manual therapy, Pain, Range of motion

14. HEADACHES

Muscles and HA's

Eur J Pain. 2015 Jul 6. doi: 10.1002/ejp.748.

Muscles and their role in episodic tension-type headache: implications for treatment.

Bendtsen L¹, Ashina S², Moore A³, Steiner TJ^{4,5}.

Author information

Abstract

BACKGROUND AND OBJECTIVE:

Tension-type headache (TTH) imposes a heavy burden on the global population but remains incompletely understood and poorly managed.

DATABASES AND DATA TREATMENT:

Here, we review current knowledge of peripheral factors involved in the mechanism of TTH and make recommendations for the treatment of episodic TTH based on these.

RESULTS:

Peripheral activation or sensitization of myofascial nociceptors is most probably involved in the development of muscle pain and the acute episode of TTH. Repetitive episodes of muscle pain may sensitize the central nervous system resulting in progression of TTH to the chronic form. Thus, muscular factors may be responsible not only for the acute headache episode but also for chronification of the disorder. Simple analgesics and non-steroidal anti-inflammatory drugs are the mainstays of management of individual headache episodes. Ibuprofen 400 mg and aspirin 1000 mg are recommended as drugs of first choice based on treatment effect, safety profile and costs. Non-pharmacological therapies include electromyographic biofeedback, physiotherapy and muscle relaxation therapy. Future studies should aim to identify the triggers of peripheral nociception and how to avoid peripheral and central sensitization. There is a need for more effective, faster acting drugs for acute TTH.

CONCLUSION:

Muscular factors play an important role in episodic TTH. Ibuprofen 400 mg and aspirin 1000 mg are recommended as drugs of first choice.

PMID: 26147739

HA's a continuum?

Pain. 2015 Jul;156(7):1200-7. doi: 10.1097/j.pain.0000000000000157.

Are migraine and tension-type headache diagnostic types or points on a severity continuum? An exploration of the latent taxometric structure of headache.

Turner DP¹, Smitherman TA, Black AK, Penzien DB, Porter JA, Lofland KR, Houle TT.
Author information

Abstract

The objective of this study was to assess whether migraine and tension-type headache (TTH) are best viewed as discrete entities or points on a severity continuum using taxometric analysis. Historically, classification systems have conceptualized the primary headache disorders of migraine and TTH as fundamentally different disorders that are differentiated by their characteristic symptom profiles and, as such, imply differing pathophysiologies and required treatments. Despite this categorical nosology, findings continue to emerge suggesting that migraine and TTH instead reflect dimensions of severity within the same headache construct. However, few studies have assessed this issue using taxometric statistical analyses or investigated how this taxonomic structure varies as a function of age and headache frequency.

We conducted a latent-mode factor analysis of headache symptomatology obtained from 3449 individuals with headache from 2 previous, large-scale cross-sectional studies of primary headache sufferers (Martin et al., 2005, and Smitherman and Kolivas, 2013). Stratified taxometric analyses suggest that the validity of a categorical vs dimensional classification varies as a function of sample characteristics. Specifically, graphical results revealed that high headache frequency (>15 d/mo) and younger age (<24 years old) were associated with unimodal distributions suggestive of a dimensional construct of primary headache, whereas lower headache frequency and older age were associated with bimodal distributions characteristic of discrete diagnostic entities.

Conceptualizing primary headache as a severity continuum was supported for young adults and those with frequent headaches. The distinctions of a categorical classification system were supported for adults (>24 years old) and those with infrequent headache.

PMID:25775357

Vertigo and HA's

J Headache Pain. 2015 Dec;16:547. doi: 10.1186/s10194-015-0547-z. Epub 2015 Jul 4.

Migraine is associated with an increased risk for benign paroxysmal positional vertigo: a nationwide population-based study.

Chu CH¹, Liu CJ, Lin LY, Chen TJ, Wang SJ.
Author information

Abstract

BACKGROUND:

There is evidence suggesting that migraine may be associated with vertigo. The aim of this study was to assess the risk of benign paroxysmal positional vertigo (BPPV), the most common form of vertigo, in patients with migraine using a population-based dataset.

METHODS:

The National Health Insurance Research Database in Taiwan was searched for migraine patients and was also used to select an age- and sex-matched cohort of subjects without migraine. The analyses included 8266 migraine patients and 8266 controls. The incidence rates of BPPV in the two cohorts were compared. Cox proportional hazard models were used to identify risk factors for BPPV in migraine patients.

RESULTS:

In the migraine cohort, 1.11 % of the patients developed BPPV compared to 0.5 % of the controls. The incidence rate ratio was 2.03 (95 % CI 1.41-2.97; $p < 0.001$). Cox proportional hazards analysis showed that age ≥ 40 years (HR 2.20; 95 % CI 1.40-3.45; $p = 0.001$), coronary artery disease (HR 4.62; 95 % CI 1.12-19.01; $p = 0.034$), and the number of outpatient department visits to neurologists because of migraine (HR 2.93; 95 % CI 2.50-3.44; $p > 0.001$) were associated with an increased risk for BPPV.

CONCLUSION:

The results showed that patients with migraine had a 2.03-fold increased risk of developing BPPV compared with age- and sex-matched controls. Although BPPV may not be a common condition in migraine patients, migraine sufferers with vestibular symptoms should alert physicians to the possibility of BPPV, particularly if patients are aged ≥ 40 years, have a history of coronary artery disease, or have frequent visits to neurologists clinics because of migraine.

PMID: 26141381

Early diagnosis of migraine

Early diagnosis of migraine necessary in children: 10-year follow-up

Pediatric Neurology , 06/26/2015 Galinski M, et al.

The main objective was to evaluate disease course 10 years after migraine diagnosis in a cohort of children and adolescents. Ten years after first presentation, 46% of patients had migraine but the frequency of attacks had diminished. The only factor associated with chronic migraine was age ≥ 12 years at first presentation.

Methods

- Migraine was diagnosed in 1999 in a pediatric headache reference center using International Headache Society criteria.
- In 2009, all patients were interviewed by telephone on the persistence and characteristics of any headaches.
- The main end point was prevalence of persistent migraine attacks in 2009.
- Variables associated with persistent attacks were analyzed.

Results

- Overall, 142 children were diagnosed with migraine in 1999.
- Of these, 84 were interviewed by telephone in 2009.
- In 1999, mean age was 11.6 ± 3.1 years, 54% were male, 50% had migraine without aura.
- Migraine attacks were common (1-3 attacks/week in 38%).
- Mean age at onset was 7 years and 4 months (± 3 years).
- In 2009, migraine prevalence was 39/84 (46% [95% CI 36-56]), 12 patients (14%) were headache-free, 62 patients (74%) had tension-type headaches that were isolated headaches in 33 (39%) cases.
- The rate of patients with at least one migraine attack per week fell from 37 to 8% ($p=0.001$) over the 10-year period.
- Age at the first visit to the center was significantly higher in 2009 migraine sufferers than non-sufferers (12.5 ± 3.0 vs 10.9 ± 3.1 years ($p=0.02$)).
- In multivariate analysis, age ≥ 12 years at the time of first presentation was the only significant factor associated with long-term chronic migraine (OR=3.0 [1.1-8.0]).

15. VESTIBULAR**Increased risk with HA's**

J Headache Pain. 2015 Dec;16:547. doi: 10.1186/s10194-015-0547-z. Epub 2015 Jul 4.

Migraine is associated with an increased risk for benign paroxysmal positional vertigo: a nationwide population-based study.

Chu CH¹, Liu CJ, Lin LY, Chen TJ, Wang SJ.
Author information

Abstract

BACKGROUND:

There is evidence suggesting that migraine may be associated with vertigo. The aim of this study was to assess the risk of benign paroxysmal positional vertigo (BPPV), the most common form of vertigo, in patients with migraine using a population-based dataset.

METHODS:

The National Health Insurance Research Database in Taiwan was searched for migraine patients and was also used to select an age- and sex-matched cohort of subjects without migraine. The analyses included 8266 migraine patients and 8266 controls. The incidence rates of BPPV in the two cohorts were compared. Cox proportional hazard models were used to identify risk factors for BPPV in migraine patients.

RESULTS:

In the migraine cohort, 1.11 % of the patients developed BPPV compared to 0.5 % of the controls. The incidence rate ratio was 2.03 (95 % CI 1.41-2.97; $p < 0.001$). Cox proportional hazards analysis showed that age ≥ 40 years (HR 2.20; 95 % CI 1.40-3.45; $p = 0.001$), coronary artery disease (HR 4.62; 95 % CI 1.12-19.01; $p = 0.034$), and the number of outpatient department visits to neurologists because of migraine (HR 2.93; 95 % CI 2.50-3.44; $p > 0.001$) were associated with an increased risk for BPPV.

CONCLUSION:

The results showed that patients with migraine had a 2.03-fold increased risk of developing BPPV compared with age- and sex-matched controls. Although BPPV may not be a common condition in migraine patients, migraine sufferers with vestibular symptoms should alert physicians to the possibility of BPPV, particularly if patients are aged ≥ 40 years, have a history of coronary artery disease, or have frequent visits to neurologists clinics because of migraine.

PMID: 26141381

17. SHOULDER GIRDLE**Motions with abduction****The comparison of scapular upward rotation and scapulohumeral rhythm between dominant and non-dominant shoulder in male overhead athletes and non-athletes**

Seyed Hossein Hosseinimehr Mehrdad Anbarian Ali Asghar Norasteh Javad Fardmal
 Mohammad Taghi Khosravi

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.02.010>

Highlights

- We compare the scapulohumeral rhythm between dominant and non-dominant shoulder.
- Non-athletes didn't present any asymmetry in scapular upward rotation and scapulohumeral rhythm.
- Overhead athletes presented some asymmetry in scapular upward rotation in scapular rest position, 90° and 135° abduction.
- Overhead athlete's dominant shoulders presented less scapulohumeral rhythm ratio than non-dominant shoulders.
- Clinicians should be aware that some degree of scapular asymmetry may be common in some overhead athletes.

Abstract

Previous studies have stated that the scapulohumeral rhythm dysfunction can make person prone to glenohumeral joint pathologies. The purpose of this study was to compare scapular upward rotation and scapulohumeral rhythm between dominant and non-dominant shoulder in male overhead athletes and non-athletes. Seventeen overhead athletes and seventeen non-athletes volunteered for this study. Two inclinometers were used to measure humeral abduction and scapular upward rotation in rest position, 45°, 90° and 135° humeral abduction in frontal plane. Findings indicated there was no significant asymmetry in scapular upward rotation and scapulohumeral rhythm in different abduction angles between dominant and non-dominant shoulder in non-athletes. In contrast, overhead athletes' dominant shoulders have more downward rotation in scapular rest position and more upward rotation in 90° and 135° shoulder abduction than non-dominant shoulders. Also, overhead athletes presented scapulohumeral rhythm asymmetry between dominant and non-dominant shoulder in 90° and 135° humeral abduction as dominant shoulders have less scapulohumeral rhythm ratio than non-dominant shoulders. Furthermore, overhead athletes dominant shoulders have more scapular downward rotation in scapular rest position, more scapular upward rotation in 90° and 135° humeral abduction and less scapulohumeral rhythm ratio in 45°, 90° and 135° humeral abduction than non-athletes in dominant shoulders.

We suggest that clinicians should be aware that some scapular asymmetry may be common in some athletes. It should not be considered as a pathological sign but rather an adaptation to extensive use of upper limb.

Keywords: Scapulohumeral rhythm, Overhead athletes, Scapular kinematic

19. GLENOHUMERAL/SHOULDER**Exercise and subacromial impingement****Is exercise effective for the management of subacromial impingement syndrome and other soft tissue injuries of the shoulder? A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration**

Sean Y. Abdulla

Danielle Southerst Pierre Côté Heather M. Shearer Deborah Sutton Kristi Randhawa Sharanya Varatharajan Jessica J. Wong Hainan Yu Andr ee-Anne Marchand Karen Chrobak Erin Woitzik Gabrielle van der Velde Anne Taylor-Vaisey
Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.03.013>

Highlights

- Evidence on exercise for shoulder soft tissue injuries is limited.
- Rotator cuff strengthening/stretching is effective for subacromial impingement.
- Shoulder strengthening/stretching is effective for nonspecific shoulder pain.
- Future research should assess exercise for various shoulder pain diagnoses.

Abstract**Background**

Exercise is a key component of rehabilitation for soft tissue injuries of the shoulder; however its effectiveness remains unclear.

Objective

Determine the effectiveness of exercise for shoulder pain.

Methods

We searched seven databases from 1990 to 2015 for randomized controlled trials (RCTs), cohort and case control studies comparing exercise to other interventions for shoulder pain. We critically appraised eligible studies using the Scottish Intercollegiate Guidelines Network (SIGN) criteria. We synthesized findings from scientifically admissible studies using best-evidence synthesis methodology.

Results

We retrieved 4853 articles. Eleven RCTs were appraised and five had a low risk of bias. Four studies addressed subacromial impingement syndrome. One study addressed nonspecific shoulder pain. For variable duration subacromial impingement syndrome: 1) supervised strengthening leads to greater short-term improvement in pain and disability over wait listing; and 2) supervised and home-based strengthening and stretching leads to greater short-term improvement in pain and disability compared to no treatment. For persistent subacromial impingement syndrome: 1) supervised and home-based strengthening leads to similar outcomes as surgery; and 2) home-based heavy load eccentric training does not add benefits to home-based rotator cuff strengthening and physiotherapy. For variable duration low-grade nonspecific shoulder pain, supervised strengthening and stretching leads to similar short-term outcomes as corticosteroid injections or multimodal care.

Conclusion

The evidence suggests that supervised and home-based progressive shoulder strengthening and stretching are effective for the management of subacromial impingement syndrome. For low-grade nonspecific shoulder pain, supervised strengthening and stretching are equally effective to corticosteroid injections or multimodal care.

Keywords: Shoulder pain, Subacromial impingement syndrome, Exercise, Systematic review

Abduction muscle activation

Does changing the plane of abduction influence shoulder muscle recruitment patterns in healthy individuals?

Darren Reed Ian Cathers Mark Halaki Karen A. Ginn

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.04.014>

Highlights

- Shoulder muscle activity is investigated during abduction performed in three planes.
- Scapular plane abduction is used as the reference plane.
- Individual shoulder muscle activation patterns are similar in all three planes.
- Only deltoid and upper trapezius activity levels show small variation between planes.
- Scapular plane abduction is a similar exercise to abduction performed in other planes.

Abstract

Study design

Observational laboratory study.

Background

Abduction is a movement commonly used in the assessment of shoulder dysfunction and prescription of exercises to improve shoulder function. Abduction in the scapular and coronal planes are used interchangeably. It is not known if the activation of individual shoulder muscles differ between abduction performed in these planes and therefore, if they represent different tests/exercises.

Objective

To quantify and compare the muscle activation patterns and levels for each shoulder muscle during abduction performed in the scapular plane with that performed in the coronal (scapular -30°) and scapular $+30^\circ$ planes.

Methods

Electromyographic recordings were taken from eight shoulder muscles of fourteen healthy volunteers during shoulder abduction in the scapular and coronal planes and in a plane 30° anterior to the scapular plane (scapular $+30^\circ$) at 50% of maximum load.

Results

Similar average muscle activation levels were demonstrated during abduction in the scapular plane and within a 30° arc of this plane for all muscles except: middle deltoid (5% MVC higher activation in the coronal and 4% MVC lower activation in the scapular $+30^\circ$ plane) and upper trapezius (6% MVC lower activation in the scapular $+30^\circ$ plane). Activation patterns between planes for all muscles were similar ($ICC(3,1) \geq 0.87$).

Conclusions

Abduction can be performed within a 30° arc of the scapular plane with no change in shoulder muscle activation patterns. Only middle deltoid activation levels change between the scapular and coronal planes and middle deltoid and upper trapezius between the scapular and scapular $+30^\circ$ planes.

Keywords: Shoulder, Abduction, Muscle activation, Electromyography

27. HIP**Hip pain and deep vein thrombosis**

Blood Coagul Fibrinolysis. 2015 Jul;26(5):572-3. doi: 10.1097/MBC.0000000000000271.

Deep venous thrombosis in a patient presenting with severe left inguinal and hip pain: a case report.

Fidan F¹, Alkan BM, Tosun A, Ardçođlu Ö.

Author information

Abstract

Deep venous thrombosis (DVT) is a disease presenting with thrombosis and obstruction of its branches and interruption of blood flow of lower extremities. Pain, severe discomfort and swelling are the most frequent symptoms of DVT and the most life-threatening manifestation is pulmonary embolism. Herein an otherwise healthy, 27-year-old male patient presented with severe left inguinal and hip pain due to the DVT of proximal left lower extremity is presented. We assume that DVT should be kept in mind in patients presenting with musculoskeletal system pain, as it may cause life-threatening complications such as pulmonary thromboembolism.

PMID: 25692522

29. OA

PRP injections

BMC Musculoskelet Disord. 2015 Jun 20;16:153. doi: 10.1186/s12891-015-0605-3.

Effects over time of two platelet gel supernatants on growth factor, cytokine and hyaluronan concentrations in normal synovial membrane explants challenged with lipopolysaccharide.

Ríos DL¹, López C², Álvarez ME³, Samudio IJ⁴, Carmona JU⁵.

Author information

Abstract

BACKGROUND:

Platelet-rich plasma (PRP) preparations are a common treatment in osteoarthritis (OA) and inflammatory synovitis. However, there is ambiguity regarding the ideal concentration of leukocytes and platelets in these preparations necessary to induce an adequate anti-inflammatory and anabolic response in joint tissues, such as the synovial membrane. This research aimed to study, in normal synovial membrane explants (SME) challenged with lipopolysaccharide (LPS), the temporal effects (at 48 and 96h) of leukocyte- and platelet-rich gel (L-PRG) and pure platelet-rich gel (P-PRG) supernatants on the production and degradation of platelet associated growth factors (GF) (platelet derived GF isoform BB (PDGF-BB) and transforming growth factor beta-1 (TGF- β 1)), pro-inflammatory (tumour necrosis factor alpha (TNF- α)) and anti-inflammatory cytokines (interleukin 4 (IL-4) and IL-1 receptor antagonists (IL-1ra)) and hyaluronan (HA).

METHODS:

Synovial membrane explants (SMEs) from 6 horses were challenged with LPS and cultured for 96h with L-PRG and P-PRG supernatants at concentrations of 25 and 50 %, respectively. The SME culture medium was changed every 48h and used for determination by ELISA of PDGF-BB, TGF- β 1, TNF- α , IL-4, IL-1ra and HA. These molecules were also determined in synovial fluid from the horses.

RESULTS:

Both the 25 and 50 % PRG supernatants produced a molecular profile in the culture media unlike that of the SME challenged with LPS only. They presented GF, cytokine and HA concentrations very near to the concentrations of these molecules in normal synovial fluid when compared with the SME control groups (either with LPS or without LPS). However, in comparison with the rest of the SME treated groups, the 25 % L-PRG produced the most IL-1ra, and the 50 % P-PRG induced the sustained production of IL-4 and HA.

CONCLUSIONS:

These in vitro findings suggest that anabolic and anti-inflammatory joint responses depend on the leukocyte and platelet concentration of the PRP preparation and on the volume of this substance injected. Moreover, it is possible, that leukoreduced PRP preparations are more effective for the medical treatment of patients with OA and inflammatory synovitis.

PMID:26092588

30 A. IMPINGEMENT**Hip Strength**

Arthroscopy. 2015 Jun 20. pii: S0749-8063(15)00413-2. doi: 10.1016/j.arthro.2015.04.095.

Hip Strength Deficits in Patients With Symptomatic Femoroacetabular Impingement and Labral Tears.

Nepple JJ¹, Goljan P², Briggs KK³, Garvey SE⁴, Ryan M⁵, Philippon MJ⁶.

Author information

Abstract

PURPOSE:

To determine the prevalence of hip strength deficits in a consecutive cohort of patients with unilateral femoroacetabular impingement (FAI) compared with the asymptomatic contralateral hip.

METHODS:

Fifty consecutive patients undergoing hip arthroscopy for symptomatic FAI underwent preoperative hip strength dynamometer measurements and were included in the study. Manual isometric hip strength measurements were performed with a handheld dynamometer and included measurements of various hip strengths (flexion, extension, adduction, abduction, internal rotation, and external rotation). Weakness greater than or equal to 10% for any given measurement was defined as a strength deficit in this study. Clinical data including age, gender, size of labral tear, and preoperative outcome scores were recorded. Outcome scores included the modified Harris Hip Score and Short Form 12 Physical Component.

RESULTS:

The mean age of patients in the study was 32.0 years (range, 18.1 to 49.8 years). There were 32 male and 18 female patients. Hip abduction strength deficits were seen in 46% of patients and flexion strength deficits in 42% of patients. An 8% decrease in strength of the involved hip was seen in flexion, and an 8.7% decrease was seen in abduction. Patients with hip flexion strength deficits had a loss of function (mean modified Harris Hip Score, 57.8 v 66.1; $P = .021$) and larger labral tears (mean, 39 mm v 28 mm; $P = .003$). Hip flexion strength deficits correlated with loss of hip flexion ($r = 0.373$, $P = .008$).

CONCLUSIONS:

Hip strength deficits were common in patients presenting with unilateral symptomatic FAI and occurred most commonly in hip abduction and flexion. Strength deficits in hip flexion were associated with decreased function, loss of motion, and larger labral tears in patients with FAI and labral tears.

LEVEL OF EVIDENCE: Level IV, prognostic case series.

PMID:26105092

31. KNEE

PRP vs Hyaluronic acid

Am J Sports Med. 2015 Jul;43(7):1575-82. doi: 10.1177/0363546515582027. Epub 2015 May 7.

Platelet-Rich Plasma Intra-articular Knee Injections Show No Superiority Versus Viscosupplementation: A Randomized Controlled Trial.

Filardo G¹, Di Matteo B², Di Martino A¹, Merli ML¹, Cenacchi A³, Fornasari P³, Marcacci M¹, Kon E⁴.

Author information

Abstract

BACKGROUND: Osteoarthritis (OA) is a common disease that will affect almost half the population at some point in their lives through pain and decreased functional capacity. New nonoperative options are being proposed to treat earlier stages of joint degeneration to provide symptomatic relief and delay surgical intervention.

PURPOSE: To evaluate the benefit provided by platelet-rich plasma (PRP) injections to treat knee joint degeneration in comparison with hyaluronic acid (HA), the most common injective treatment currently adopted for this condition.

STUDY DESIGN: Randomized controlled trial; Level of evidence, 1.

METHODS: A total of 443 patients were screened, and 192 of them were enrolled in the study according to the following inclusion criteria: (1) unilateral symptomatic knee with history of chronic pain (at least 4 months) or swelling and (2) imaging findings of degenerative changes (Kellgren-Lawrence score of 0-3 at radiographs or MRI evidence of degenerative chondropathy). Patients underwent 3 weekly intra-articular injections of either PRP or HA. Patients were prospectively evaluated at baseline and then at 2, 6, and 12 months of follow-up using the International Knee Documentation Committee (IKDC) subjective score (main outcome), Knee injury and Osteoarthritis Outcome Score, EuroQol visual analog scale, and Tegner score. Range of motion, transpatellar circumference, patient satisfaction, and adverse events were also recorded.

RESULTS: Two patients reported severe pain and swelling after HA injections, while no major adverse events were noted in the PRP group. However, PRP presented overall significantly more postinjection swelling and pain. Both treatments proved to be effective in improving knee functional status and reducing symptoms: the IKDC score in the PRP group rose from 52.4 ± 14.1 to 66.2 ± 16.7 at 12 months ($P < .0005$), and in the HA group it rose from 49.6 ± 13.0 to 64.2 ± 18.0 at 12 months ($P < .0005$). A similar trend was observed for all the clinical scores used. The comparative analysis of the 2 treatments showed no significant intergroup difference at any follow-up evaluation in any of the clinical scores adopted.

CONCLUSION: PRP does not provide a superior clinical improvement with respect to HA, and therefore it should not be preferred to viscosupplementation as injective treatment of patients affected by knee cartilage degeneration and OA.

KEYWORDS: PRP; cartilage; growth factors; injections; intra-articular; osteoarthritis; viscosupplementation

PMID: 25952818

32 A. KNEE/ACL**Course in infrapatellar nerve**

Knee. 2014 Nov 26. pii: S0968-0160(14)00270-1. doi: 10.1016/j.knee.2014.11.003.

The course and distribution of the infra patellar nerve in relation to ACL reconstruction.

Walshaw T¹, Karuppiah SV², Stewart I¹.

Author information

Abstract

INTRODUCTION:

A common complication after ACL (anterior cruciate ligament reconstruction) is injury to the infra-patellar branch of the saphenous nerve (IPBSN). Very little about its origin and course of this nerve has been described. The aim of this study was to understand the course of IPBSN in relation to surgery around the knee.

MATERIALS AND METHOD:

The course of the nerve was dissected and traced in 25 knees from 14 cadaveric knees (10 males; four females). An incision was made posterior to the medial condyle of the tibia and continued deeper towards the saphenous nerve which is located under the sartorius muscle. The saphenous nerve branch was then followed to distally supply the anterior leg (IPBSN). The relationship of saphenous nerve and IPBSN to each other and the hamstrings were recorded.

RESULTS:

Four paths of IPBSN, in relation to the sartorius muscle, were identified: (1) posterior - inferior posterior border of the muscle, (2) transmuscular - penetrating through the muscle, (3) anterior - anterior border of the muscle, (4) posterior patellar - posterior of the muscle at the level of the patellar bone and (5) combined. The posterior pathway of IPBSN was the most common (57%) and had the closest proximity to the tendons of semitendinosus and gracilis muscles. The terminal branches of the IPBSN crossed over the patellar tendon in every dissection.

CONCLUSIONS:

A posterior path IPBSN is more prone to damage during a tendon harvest due to its proximity to the gracilis and semitendinosus muscle tendons.

KEYWORDS: Anterior cruciate ligament; Arthroscopy; Infrapatella nerve; Loss of sensation; Nerve damage

PMID: 26100316

Outcomes

Am J Sports Med. 2015 Jul;43(7):1591-7. doi: 10.1177/0363546515577364. Epub 2015 Apr 13.

Outcomes After Anterior Cruciate Ligament Reconstruction Using the Norwegian Knee Ligament Registry of 4691 Patients: How Does Meniscal Repair or Resection Affect Short-term Outcomes?

LaPrade CM¹, Dornan GJ², Granan LP³, LaPrade RF⁴, Engebretsen L⁵.
Author information

Abstract

BACKGROUND: While the effects of concurrent meniscal resection and anterior cruciate ligament reconstruction (ACLR) are known to decrease patient outcomes and increase the rate of osteoarthritis over the long term, overall short-term patient functional outcomes in a large cohort of patients are not well known.

PURPOSE/HYPOTHESIS: The purpose of this study was to compare the preoperative and 2-year postoperative Knee Injury and Osteoarthritis Outcome Score (KOOS) subscale scores after ACLR with and without meniscal injury. The hypothesis was that, in comparison with an isolated ACLR, patients with a medial meniscal (MM) or lateral meniscal (LM) resection with an ACLR would have significantly decreased 2-year postoperative KOOS outcomes, while those with an ACLR with an MM or LM repair would be indistinguishable from isolated ACLR.

STUDY DESIGN: Cohort study; Level of evidence, 2.

METHODS: The Norwegian Knee Ligament Registry (NCLR) was used to evaluate outcomes for a total of 4691 patients with primary ACLR. The KOOS scoring system was used to evaluate patients on 5 subscales (Pain, Other Symptoms, Activities of Daily Life [ADL], Sport and Recreation Function, and Quality of Life [QoL]) at time of surgery and at 2-year postoperative follow-up. Patients with isolated ACLR and ACLR with LM repair, LM resection, MM repair, or MM resection were compared using multiple linear regression modeling.

RESULTS: Preoperatively, in comparison with isolated ACLR, patients who had an ACLR with either an MM repair or MM resection had significantly lower scores for all KOOS subscores, and LM repair had significantly decreased scores on the Other Symptoms, Pain, and ADL subscales. Postoperatively, in comparison with isolated ACLR, 2-year KOOS outcomes were not significantly different between patients with ACLR and LM repair, MM resection, or LM resection; however, those with MM repair had significantly lower scores on the Other Symptoms and QoL subscales.

CONCLUSION: Patients with ACLR with meniscal resections do not exhibit decreased clinical outcomes at 2 years postoperatively. It is recommended that clinicians follow patients with ACLR and concurrent meniscal treatment for longer than 2 years postoperatively.

KEYWORDS: anterior cruciate ligament; meniscal repair; meniscal resection; patient outcomes; registry

PMID: 25868635

Risk of failure

Am J Sports Med. 2015 Jul;43(7):1583-90. doi: 10.1177/0363546515578836. Epub 2015 Apr 21.

Risk Factors and Predictors of Subsequent ACL Injury in Either Knee After ACL Reconstruction: Prospective Analysis of 2488 Primary ACL Reconstructions From the MOON Cohort.

Kaeding CC¹, Pedroza AD², Reinke EK³, Huston LJ³; MOON Consortium, Spindler KP⁴.

Collaborators (14)

Author information

Abstract

BACKGROUND:

Anterior cruciate ligament (ACL) reinjury results in worse outcomes and increases the risk of posttraumatic osteoarthritis.

PURPOSE:

To identify the risk factors for both ipsilateral and contralateral ACL tears after primary ACL reconstruction (ACLR).

STUDY DESIGN:

Cohort study; Level of evidence, 3.

METHODS:

Data from the Multicenter Orthopaedic Outcomes Network (MOON), a prospective longitudinal cohort, were used to identify risk factors for ACL retear. Subjects with primary ACLR, no history of contralateral knee surgery, and a minimum of 2-year follow-up data were included. Age, sex, Marx activity score, graft type, lateral meniscal tear, medial meniscal tear, sport played at index injury, and surgical facility were evaluated to determine their contribution to both ipsilateral retear and contralateral ACL tear.

RESULTS:

A total of 2683 subjects with average age of 27 ± 11 years (1498 men; 56%) met all study inclusion/exclusion criteria. Overall there were 4.4% ipsilateral graft tears and 3.5% contralateral ACL tears. The odds of ipsilateral ACL retear were 5.2 times greater for an allograft ($P < .01$) compared with a bone-patellar tendon-bone (BTB) autograft; the odds of retear were not significantly different between BTB autograft and hamstring autograft ($P = .12$). The odds of an ipsilateral ACL retear decreased by 0.09 for every yearly increase in age ($P < .01$) and increased by 0.11 for every increased point on the Marx score ($P < .01$). These odds were not significantly influenced by sex, smoking status, sport played, medial or lateral meniscal tear, or consortium site ($P > .05$). The odds of a contralateral ACL tear decreased by 0.04 for every yearly increase in age ($P = .04$) and increased by 0.12 for every increased point on the Marx score ($P < .01$); these odds were not significantly different between sex, smoking status, sport played, graft type, medial meniscal tear, or lateral meniscal tear ($P > .05$).

CONCLUSION:

Younger age, higher activity level, and allograft graft type were predictors of increased odds of ipsilateral graft failure. Higher activity and younger age were found to be risk factors in contralateral ACL tears.

KEYWORDS: ACL reconstruction; allograft; anterior cruciate ligament; autograft; failure; outcomes; re-tear
PMID: 25899429

33. MENISCUS

Meniscectomy vs repair

Arthroscopy. 2015 Jun 18. pii: S0749-8063(15)00262-5. doi: 10.1016/j.arthro.2015.03.035.

Comparison of Clinical and Radiologic Results Between Partial Meniscectomy and Refixation of Medial Meniscus Posterior Root Tears: A Minimum 5-Year Follow-up.

Chung KS¹, Ha JK², Yeom CH², Ra HJ³, Jang HS², Choi SH², Kim JG⁴.
Author information

Abstract

PURPOSE:

To compare the clinical and radiologic results of partial meniscectomy with those of refixation in patients with medial meniscus posterior root tears (MMPRTs) at a minimum 5-year follow-up.

METHODS:

Between 2005 and 2009, patients with MMPRTs who had been followed up for at least 5 years after a partial meniscectomy (group M, n = 20) or pullout repair (group R, n = 37) were recruited. The mean follow-up duration was 67.5 months in group M and 72.0 months in group R. Clinical assessments, including the Lysholm score and International Knee Documentation Committee (IKDC) Subjective Knee Form score, and radiographic assessments, including the Kellgren-Lawrence (K-L) grade and medial joint space width, were evaluated preoperatively and at final follow-up. We compared the preoperative results with the final results in each group, and we compared the final results of groups M and R. Five-year survival rates were also evaluated.

RESULTS:

The mean Lysholm score (P = .039) and IKDC score (P = .037) improved significantly. However, the width of the medial joint space (P < .001) and K-L grade (P < .001) worsened significantly in both groups. When we compared the final results, group R had significantly better Lysholm scores (P = .002) and IKDC scores (P < .001) than group M. Group R showed less K-L grade progression (P = .005) and less medial joint space narrowing (P < .001) than group M. The rate of conversion to total knee arthroplasty was 35% in group M, whereas there was no conversion to total knee arthroplasty in group R. The 5-year survival rates in groups M and R were 75% and 100%, respectively (P < .001).

CONCLUSIONS:

For MMPRTs, refixation was more effective than partial meniscectomy in terms of the clinical and radiologic outcomes and survival for at least 5 years' follow-up. Refixation slowed the progression of arthritic changes compared with partial meniscectomy, although it did not prevent the progression of arthrosis completely.

LEVEL OF EVIDENCE: Level III, retrospective comparative study.

PMID: 26095821

Stem cells (synovial) and cartilage

Clin Orthop Relat Res. 2015 Jul;473(7):2316-26. doi: 10.1007/s11999-015-4324-8. Epub 2015 Apr 30.

Arthroscopic Transplantation of Synovial Stem Cells Improves Clinical Outcomes in Knees With Cartilage Defects.

Sekiya I¹, Muneta T, Horie M, Koga H.
Author information

Abstract

BACKGROUND: Transplantation of mesenchymal stem cells (MSCs) is one possible strategy to achieve articular cartilage repair. We previously reported that synovial MSCs were highly proliferative and able to undergo chondrogenesis. We also found that placing a suspension of synovial MSCs on a cartilage defect for 10 minutes promoted cartilage repair in rabbit and pig models. However, the in vivo efficacy of this approach has not been tested clinically.

QUESTIONS/PURPOSES: We asked whether transplantation of synovial MSCs improves (1) MRI features, (2) histologic features, and (3) clinical evaluation scores in patients with cartilage defects in the knee?

METHODS: Patients with a symptomatic single cartilage lesion of the femoral condyle were indicated for inclusion in our study, and between April 2008 and April 2011, 10 patients were enrolled in this study. All patients completed followups of 3 years or more. The average followup period was 52 months (range, 37-80 months). Synovial MSCs were expanded with 10% autologous human serum for 14 days after digestion. For transplantation, the patient was positioned so that the cartilage defect was facing upward, and synovial MSC suspension was placed on the cartilage defect with a syringe under arthroscopic control. The defect with the applied suspension then was held in the upward position for 10 minutes. Five patients underwent concomitant ACL reconstructions, among whom two had meniscus suturing performed simultaneously. For MRI quantification, the cartilage defect was scored from 0 to 5. Second-look arthroscopy was performed for four patients and biopsy specimens were evaluated histologically. Clinical outcome was assessed using the Lysholm score and Tegner Activity Level Scale at final followup. Comparisons of MRI and Lysholm scores before and after treatment for each patient were analyzed using the Wilcoxon signed-rank test.

RESULTS: MRI score (median \pm 95% CI) was 1.0 ± 0.3 before and 5.0 ± 0.7 after, and increased after treatment in each patient ($p = 0.005$). Second-look arthroscopy in four patients showed that the cartilage defect appeared to be qualitatively better in all cases. Histologic analyses showed hyaline cartilage in three patients and fibrous cartilage in one at the deep zone. The Lysholm score (median \pm 95% CI) was 76 ± 7 before and 95 ± 3 after, and increased after treatment in each patient ($p = 0.005$). The Tegner Activity Level Scale did not decrease after treatment in each patient.

CONCLUSIONS: For this small initial case series, transplantation of synovial MSCs was effective in terms of MRI score, qualitative histology, and Lysholm score. The use of synovial MSCs has an advantage in that the cells can be prepared at passage 0 in only 14 days. Transplantation of synovial MSCs may be less invasive than mosaicplasty and autologous chondrocyte implantation. To conclusively show the effectiveness of this treatment requires comparative studies, especially with more established arthroscopic procedures, such as marrow stimulation techniques.

LEVEL OF EVIDENCE: Level IV, therapeutic study.

PMID: 25925939

34. PATELLA

Morphology

Knee. 2015 Jun 19. pii: S0968-0160(15)00114-3. doi: 10.1016/j.knee.2015.05.010.

Comprehensive assessment of patellar morphology using computed tomography-based three-dimensional computer models.

Huang AB¹, Luo X¹, Song CH¹, Zhang JY¹, Yang YQ², Yu JK³.

Author information

Abstract

BACKGROUND:

The objectives of this study were to assess patellar morphology using computed tomography-based three-dimensional computer models and to determine the utility of the subchondral method for patellar resection in total knee arthroplasty (TKA).

METHODS:

Overall, 120 subjects (60 males, 60 females) from 20 to 50 years old were included. Computer tomography images were used to construct 3D computer models of 240 knees. An anthropometric analysis of variance was used with the models to detect differences between the sides, age groups, and genders.

RESULTS:

Based on the available numbers, there were significant gender differences in the patellar length, width, and thickness even with strict control for the height and weight of the patients. The average patellar width/thickness ratio was 1.95, regardless of gender, and there was a good correlation between the patellar width and thickness (male: $r=0.68$, $p<0.01$; female: $r=0.75$, $p<0.01$). After using the subchondral method to virtually resect the patellae, the mean thickness for males and female was 14.0mm and 12.3mm, respectively. The proportion of the residual bony thickness that was less than 12mm was 5.83% (seven cases) in the male group and up to 42.5% (51 cases) in the female group. There was excellent intra-observer reliability and inter-observer reliability regarding the dimensional measurements in this study.

CONCLUSIONS:

A robust method of measuring and virtually resecting the patella was established. The anthropometric dimensions of this study could provide basic data for guiding surgical management of the patella in TKA and are useful in designing patellar implants.

CLINICAL RELEVANCE:

The anthropometric patellar information is essential for surgeons to perform patellar resurfacing in TKA.

KEYWORDS: Anatomy; Morphometry; Patella; Resurfacing

PMID: 26100317

35. KNEE/TOTAL

Patient specific functional scale

RESEARCH REPORT

The Patient-Specific Functional Scale: Its Reliability and Responsiveness in Patients Undergoing a Total Knee Arthroplasty

Authors: Danielle D.P. Berghmans, PT1,2, Antoine F. Lenssen, PT, PhD1, Lodewijk W. van Rhijn, PhD2,3, Rob A. de Bie, PhD2,4

Published: Journal of Orthopaedic & Sports Physical Therapy,
2015, Volume: 45 Issue: 7 Pages: 550-556 doi:10.2519/jospt.2015.5825

References

Study Design A prospective cohort study, with assessments before, at 3 months after, and at 12 months after total knee arthroplasty (TKA).

Objectives To determine and compare the responsiveness and reliability of the Patient-Specific Functional Scale (PSFS) in patients undergoing a TKA.

Background Reliable and valid measurement instruments are important to measure functional status. The PSFS is frequently used in several patient populations, but its methodological characteristics in a population of patients with TKA in the perioperative phases of surgery are unknown.

Methods The PSFS, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and global perceived effect (GPE) were administered at 3 time points in 150 patients undergoing a TKA. Correlations, effect sizes, and standardized response means were calculated. The PSFS was administered twice to assess its reliability in terms of intraclass correlation coefficients and limits of agreement.

Results The correlation coefficients between the PSFS and WOMAC at 3 months and 1 year were 0.41 and 0.48, respectively; those between the PSFS and GPE were -0.37 and -0.55 , respectively. The effect sizes of the PSFS at 3 months and 1 year were 1.71 and 2.89, respectively; those of the WOMAC were 1.45 and 1.64, respectively. The standardized response means of the PSFS at 3 months and 1 year were 0.96 and 1.48, respectively; those of the WOMAC were 1.28 and 1.37, respectively. The intraclass correlation coefficients ranged between 0.73 and 0.86. The systematic error was between 0.12 and 0.54. The limits of agreement ranged from ± 2.17 to ± 2.72 .

Conclusion The reliability of the PSFS is good. Its responsiveness is high, especially in the long term. However, the PSFS cannot be used interchangeably with the WOMAC in the immediate postoperative period. *J Orthop Sports Phys Ther* 2015;45(7):550–556. Epub 21 May 2015. doi:10.2519/jospt.2015.5825

Keyword: osteoarthritis, Patient-Specific Functional Scale, PSFS, reliability, responsiveness

41 B. COMPARTMENT SYNDROME

Fasciotomy's

J Orthop Trauma. 2015 Jul;29(7):308-11. doi: 10.1097/BOT.0000000000000278.

Delayed Primary Closure of Fasciotomy Incisions in the Lower Leg: Do We Need to Change Our Strategy?

Weaver MJ¹, Owen TM, Morgan JH, Harris MB.
Author information

Abstract

OBJECTIVES:

The primary purpose of this study is to determine whether a strategy of bringing patients back to the operating room for successive debridements allows for the eventual delayed primary closure (DPC) of fasciotomy wounds.

DESIGN:

Retrospective cohort study. Data were collected from medical records and radiographs.

SETTING:

Two urban level 1 trauma centers.

PATIENTS:

One hundred four adult patients with acute compartment syndrome in the setting of a tibia fracture (open or closed).

INTERVENTION:

All patients underwent decompressive fasciotomies with closure by either DPC or split-thickness skin grafting (STSG) during a subsequent surgical procedure.

MAIN OUTCOME MEASURE:

Number of fasciotomy wounds closed by DPC after the initial fasciotomy procedure.

RESULTS:

Of the 104 patients brought to the operating room for their first debridement after their fasciotomies, 19 patients (18%) were treated with DPC, whereas 42 patients (40%) were closed with STSG because they were believed to be too swollen to allow for primary closure by the treating surgeon. Three of the remaining 43 patients were treated with DPC during their second debridement. No patients who underwent more than 2 washouts could be treated with DPC. No patients who sustained open fractures were able to be closed by DPC ($P = 0.02$). Patients who underwent STSG on their first postfasciotomy procedure had a significantly shorter hospital stay than patients who underwent additional procedures before closure (12.2 vs. 17.4 days; $P = 0.005$).

CONCLUSIONS:

Fasciotomy wounds that are not able to be primarily closed during their first postfasciotomy surgical procedure are rarely closed through DPC techniques. Early skin grafting of these wounds should be considered, especially in the clinical setting of an open injury, because it significantly decreases the length of hospital stay. Other techniques that avoid repeated debridements and attempted closures might also help reduce hospital stay.

LEVEL OF EVIDENCE: Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.

PMID: 25536212

45 A. MANUAL THERAPY LUMBAR & GENERAL

Gut feelings

The clinical reasoning processes of extended scope physiotherapists assessing patients with low back pain

Neil Langridge Lisa Roberts Catherine Pope

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.01.005>

Abstract

Introduction:

Employing allied health professionals in extended scope roles has developed relatively recently in health-care. Within physiotherapy, the extended role has provided clinicians with autonomy to use knowledge and clinical acumen to request investigations such as Magnetic Resonance Imaging (MRI) and X-ray as part of the diagnostic process, a practice beyond the traditional scope of physiotherapy. In these advancing roles, little is written about the clinical reasoning processes that clinicians use in managing patients with musculoskeletal pain and knowledge of these processes would advance training for new recruits to this arena.

Study:

This qualitative study has explored the processes by which extended scope physiotherapists (ESPs) clinically reason their decisions regarding patients reporting low back pain in a musculoskeletal outpatient setting. The study used a multiple case study design informed by grounded theory methodology, using focus groups (involving ESPs and non-ESPs/musculoskeletal physiotherapists) and semi-structured interviews with a think-aloud method (ESPs only) to investigate these processes.

Conclusions

The themes identified include: prior thinking; patient interaction; formal testing; time; safety and accountability; external and internal factors; and gut-feeling (which challenges current physiotherapy models of reasoning). Extended scope physiotherapists reported experiencing greater stress due to higher levels of perceived accountability, safety requirements and internal drivers for competence than non-ESPs. Further research is indicated to explore the role of gut-feeling in musculoskeletal physiotherapy clinical reasoning.

Keywords: Physiotherapy, Reasoning, Back, Pain

High velocity neural responses

Neural responses to the mechanical characteristics of high velocity, low amplitude spinal manipulation: Effect of specific contact site

William R. Reed Cynthia R. Long Gregory N. Kawchuk Joel G. Pickar
Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.03.008>

Highlights

•Contact site specificity for an HVLA-SM impacted neurophysiological responses.

- Contact on target vertebra increased muscle spindle activity more compared to adjacent vertebra.
- Different contact sites on same vertebra similarly influenced muscle spindle activity.
- Changes in muscle spindle responsiveness to simulated spinal movement were small.

Abstract

Background

Systematic investigations are needed identifying how variability in the biomechanical characteristics of spinal manipulation affects physiological responses. Such knowledge may inform future clinical practice and research study design.

Objective

To determine how contact site for high velocity, low amplitude spinal manipulation (HVLA-SM) affects sensory input to the central nervous system.

Design

HVLA-SM was applied to 4 specific anatomic locations using a no-HVLA-SM control at each location randomized in an 8×8 Latin square design in an animal model.

Methods

Neural activity from muscle spindles in the multifidus and longissimus muscles were recorded from L6 dorsal rootlets in 16 anesthetized cats. A posterior to anterior HVLA-SM was applied through the intact skin overlying the L6 spinous process, lamina, inferior articular process and L7 spinous process. HVLA-SMs were preceded and followed by simulated spinal movement applied to the L6 vertebra. Change in mean instantaneous discharge frequency (Δ MIF) was determined during the thrust and the simulated spinal movement.

Results

All contact sites increased L6 muscle spindle discharge during the thrust. Contact at all L6 sites significantly increased spindle discharge more than at the L7 site when recording at L6. There were no differences between L6 contact sites. For simulated movement, the L6 contact sites but not the L7 contact site significantly decreased L6 spindle responses to a change in vertebral position but not to movement to that position.

Conclusions

This animal study showed that contact site for an HVLA-SM can have a significant effect on the magnitude of sensory input arising from muscle spindles in the back.

Keywords: Manual therapy, Spinal manipulation, Specificity, Dose, Muscle spindles

Sympathetic response

A randomised, independent groups study investigating the sympathetic nervous system responses to two manual therapy treatments in patients with LBP

Jo Perry Ann Green Sally Singh Paul Watson

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.04.011>

Highlights

- A lumbar rotatory manipulation results in SC activity changes in the order of 255%.

- A McKenzie repeated EIL treatment has an SC activity response of 94%.
- Patients responses to treatment are not analogous to asymptomatic norms.
- Patients with LBP may have up-regulated DH sensitivity detectable by SC measurement.
- Longitudinal correlations of SC data, perceived pain & dysfunction are recommended.

Abstract

Manual therapy (MT) and exercise therapy techniques are commonly utilised, guideline recommended treatment strategies in the management of non-specific low back pain (LBP). Preliminary evidence on asymptomatic participants indicates that two manual therapy techniques; repeated lumbar extension in lying exercise (EIL); and segmental rotational grade V manipulation (manipulation), have significant effects on the sympathetic nervous system (SNS) as detectable with skin conductance (SC) responses. However, it is not known if these responses occur in patients with LBP.

A randomised, independent group's design was utilised to investigate the immediate SC responses in 50 patients with LBP of less than 12 weeks duration. Patients received either the manipulation technique (n = 25) or the EIL exercise (n = 25) and SC activity was recorded, in a single treatment session, pre-, peri- and post-treatment.

Both treatments resulted in a sympatho-excitatory response during the intervention period with the manipulation technique having a 255% increase ($p < 0.005$), and the EIL technique a 94% increase ($p = 0.019$) with both treatments having responses that were sustained into the final rest period ($p < 0.005$). Between-group comparisons indicate that the manipulation technique had a significantly greater magnitude of effect ($p < 0.001$).

The results support the sympatho-excitatory responses seen in normative studies but challenge the assumption that normative and patient populations are analogous with respect to the magnitude of effect observed and suggest that SC responses may be a feasible, proxy method of detecting dorsal horn sensitisation and neuro-plastic adaptations occurring in the presence of LBP.

Keywords: Manipulation, McKenzie exercise, Low back pain, Sympathetic nervous system

PA pressures

Do experienced physiotherapists and final year physiotherapy trainees apply similar force during posterior-to-anterior lumbar mobilization techniques?

Dany H. Gagnon Christian Longtin Djamal Berbiche Nathaly Gaudreault

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.05.002>

Highlights

- Force magnitude allowed for differentiation across all lumbar PA mobilization grades.

- Physiotherapists apply greater force than physiotherapy students across all grades.
- This difference warrants consideration when teaching spinal manipulative therapy.

Abstract

This study aims to quantify the force applied during posterior-to-anterior lumbar vertebrae mobilizations of different grades (I to IV) and compare that force between experienced physiotherapists and final year physiotherapy students. Four experienced physiotherapists and four final year physiotherapy students participated in this study along with five healthy asymptomatic individuals. A manual therapy table positioned over three force plates allowed for measurements of the force oscillation frequency and intensity applied during grade I, II, III and IV posterior-to-anterior (PA) mobilizations at two lumbar vertebral levels (L2 and L4). Mixed model ANOVAs were used to compare the force applied between the experienced physiotherapists and students, and between the various grades.

The results showed that the mean oscillation frequency was similar between the groups for all grades. Grade I and grade IV PA mobilizations showed similar mean oscillation frequency as did grade II and III PA mobilizations. The minimum and maximum force applied was higher for the physiotherapists than for the students for all mobilization grades (p values < 0.05). Similar mean maximum force values were recorded for PA mobilizations between grade I and II and between grade III and grade IV. Grade III and IV PA mobilizations yielded higher mean maximum force values than those recorded during grade I and grade II PA mobilizations. The method used in this study allowed for quantification of the force applied during lumbar PA mobilizations. \

Experienced physiotherapists apply greater force than physiotherapy students across all grades, despite similar oscillation frequency.

Keywords: Physiotherapy, Force, Spinal mobilization, Rehabilitation, Manual therapy

Reflective practitioner – emotions

The role of clinician emotion in clinical reasoning: Balancing the analytical process

Neil Langridge Lisa Roberts Catherine Pope

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.06.007>

Highlights

- This review paper is a novel review of clinical reasoning.

- It provides an argument for emotions and physical responses in reasoning.
- It demonstrates gaps in the musculoskeletal physiotherapy literature.
- It suggests how to enhance reflective practice.
- It gives credibility for gut-feeling and intuition.

Abstract

Introduction

This review paper identifies and describes the role of clinicians' memory, emotions and physical responses in clinical reasoning processes. Clinical reasoning is complex and multi-factorial and key models of clinical reasoning within musculoskeletal physiotherapy are discussed, highlighting the omission of emotion and subsequent physical responses and how these can impact upon a clinician when making a decision.

Discussion

It is proposed that clinicians should consider the emotions associated with decision-making, especially when there is concern surrounding a presentation. Reflecting on practice in the clinical environment and subsequently applying this to a patient presentation should involve some acknowledgement of clinicians' physical responses, emotions and how they may play a part in any decision made. Presenting intuition and gut-feeling as separate reasoning methods and how these processes co-exist with other more accepted reasoning such as hypothetico-deductive is also discussed.

Conclusion

Musculoskeletal physiotherapy should consider the elements of feelings, emotions and physical responses when applying reflective practice principles. Furthermore, clinicians dealing with difficult and challenging presentations should look at the emotional as well as the analytical experience when justifying decisions and learning from practice.

Keywords: Memory, Emotion, Physiotherapy, Reasoning

45 B. MANUAL THERAPY CERVICAL

Movement of upper cervical spine with HV

Atlanto-axial facet displacement during rotational high-velocity low-amplitude thrust: An in vitro 3D kinematic analysis

Luca Buzzatti Steven Probyn Peter Van Roy Erik Cattrysse

Highlights

- We analysed the displacement of in vitro C1–C2 joint facets during HVLA thrust.
- The displacement induced was unintentional, unpredictable and not reproducible.
- The displacement induced did not exceed 1 mm during the thrust.
- The technique seems not to be able to endanger vital structures.

Abstract

Background

Very little is known about the kinematics of the upper cervical spine in particular during Manual Therapy techniques. In fact no data about displacement of the atlanto-axial joint during High-Velocity Low-Amplitude (HVLA) thrust are available. Knowing the precise kinematics of these vertebrae might allow a better comprehension of such important technique and possible vital structures involvement.

Methods

A Zebris CMS20 ultrasound-based motion tracking system was adopted. Twenty fresh human cervical specimens were used in this study. Facet joint displacements of C1 relative to C2 were analysed during three consecutive HVLA thrusts into rotation. Displacement during the thrust and the maximum displacement reached with the manoeuvre were analysed.

Results

Descriptive statistics showed a mean Norm displacement during the thrust of 0.5 mm (SD \pm 0.5). The maximum displacement, representing the overall facet movement from neutral to end-range position, indicated a Norm value of 6.0 mm (SD \pm 3.4). Heterogeneous displacement directions were found during the thrust. Intra and inter-rater reliability reached an insufficient reproducibility level. Considering the amount of displacement induced, no statistical significant differences between the registrations were shown.

Conclusion

Displacement during the execution of HVLA thrust is unintentional, unpredictable and not reproducible. On the other hand and in accordance with other studies, the displacement induced with the present technique seems not to be able to endanger vital structure on the Spinal Cord and the Vertebral Artery. This study also adds to a better comprehension of the kinematic of the atlanto-axial segment during the performance of HVLA manipulation.

Keywords: HVLA thrust, Kinematic, Atlanto-axial, Displacement, In vitro

Manual therapy and TMJ

Efficacy of musculoskeletal manual approach in the treatment of temporomandibular joint disorder: A systematic review with meta-analysis

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Karina Ferreira Lagôa Gonçalves³ Ana Clara Bonini-Rocha⁴ Pierre-Michel Dugailly,
Ricardo Jacó de Oliveira⁵

Highlights

- Musculoskeletal manipulations approaches are effective for the treatment of TMJ.
- There is a larger effect for MMA compared to other conservative treatments.
- MMA have biomechanical and neurophysiological effects for the treatment of TMJ.

Abstract

Background

Temporomandibular joint disorder (TMD) requires a complex diagnostic and therapeutic approach, which usually involves a multidisciplinary management. Among these treatments, musculoskeletal manual techniques are used to improve health and healing.

Objectives

To assess the effectiveness of musculoskeletal manual approach in temporomandibular joint disorder patients.

Design

A systematic review with meta-analysis.

Methods

During August 2014 a systematic review of relevant databases (PubMed, The Cochrane Library, PEDro and ISI web of knowledge) was performed to identify controlled clinical trials without date restriction and restricted to the English language. Clinical outcomes were pain and range of motion focalized in temporomandibular joint. The mean difference (MD) or standard mean difference (SMD) with 95% confidence intervals (CIs) and overall effect size were calculated at every post treatment. The PEDro scale was used to demonstrate the quality of the included studies.

Results/findings

From the 308 articles identified by the search strategy, 8 articles met the inclusion criteria. The meta-analysis showed a significant difference ($p < 0.0001$) and large effect on active mouth opening (SMD, 0.83; 95% CI, 0.42 to 1.25) and on pain during active mouth opening (MD, 1.69; 95% CI, 1.09 to 2.30) in favor of musculoskeletal manual techniques when compared to other conservative treatments for TMD.

Conclusions

Musculoskeletal manual approaches are effective for treating TMD. In the short term, there is a larger effect regarding the latter when compared to other conservative treatments for TMD.

Keywords: Temporomandibular joint disorder, Manual therapy, Pain, Range of motion

45 D. MANUAL THERAPY EXTREMITIES

Ankle mob with stretching to increase ankle ROM

Immediate combined effect of gastrocnemius stretching and sustained talocrural joint mobilization in individuals with limited ankle dorsiflexion: A randomized controlled trial

Min-Hyeok Kang Jae-Seop Oh Oh-Yun Kwon Jong-Hyuk Weon Duk-Hyun An Won-Gyu Yoo

Highlights

- We examined combined effect of stretching and talocrural joint mobilization.
- Combination of both interventions increased ankle dorsiflexion during gait.
- Combination of both interventions increased time to heel-off during gait.
- General gastrocnemius stretching did not change ankle kinematics during gait.
- Combination of both interventions is useful to improve ankle kinematic during gait.

Abstract

Background

Although gastrocnemius stretching and talocrural joint mobilization have been suggested as effective interventions to address limited ankle dorsiflexion passive range of motion (DF PROM), the effects of a combination of the two interventions have not been identified.

Objective

The aim of the present study was to compare the effects of gastrocnemius stretching combined with joint mobilization and gastrocnemius stretching alone.

Design

A randomized controlled trial.

Methods

In total, 24 individuals with limited ankle DF PROM were randomized to undergo gastrocnemius stretching combined with joint mobilization (12 feet in 12 individuals) or gastrocnemius stretching alone (12 feet in 12 individuals) for 5 min. Ankle kinematics during gait (time to heel-off and ankle DF before heel-off), ankle DF PROM, posterior talar glide, and displacement of the myotendinous junction (MTJ) of the gastrocnemius were assessed before and after the interventions. The groups were compared using two-way repeated measures analysis of variance.

Results/findings

: Greater increases in the time to heel-off and ankle DF before heel-off during gait and posterior talar glide were observed in the stretching combined with joint mobilization group versus the stretching alone group. Ankle DF PROM and displacement of the MTJ of the gastrocnemius were increased significantly after the interventions in both groups, with no significant difference between them.

Conclusions

These findings suggest that gastrocnemius stretching with joint mobilization needs to be considered to improve ankle kinematics during gait.

Keywords: Ankle, Gait, Kinematics, Manual therapy

46 A. UPPER LIMB NEUROMOBILIZATION

Advancing radial nerve testing

Improving the radial nerve neurodynamic test: An observation of tension of the radial, median and ulnar nerves during upper limb positioning

Joshua J. Manvell Nicole Manvell Suzanne J. Snodgrass

Highlights

- Nerve tension during upper limb positions was measured in cadavers.
- ULNT2b + 5 sensitizing maneuvers (Composite position) demonstrated greatest tension.
- Composite position demonstrated greatest tension difference between upper limb nerves.
- Composite position is biomechanically plausible for detecting radial nerve symptoms.

Abstract

The radial nerve neurodynamic test (ULNT2b), used to implicate symptoms arising from the radial nerve, is proposed to selectively increase strain of the nerve without increasing strain of adjacent tissue, though this has not been established. This study aimed to determine the upper limb position that results in: (1) the greatest tension of the radial nerve and (2) the greatest difference in tension between the radial nerve and the other two major nerves of the upper limb: median and ulnar. Tension (N) of the radial, median and ulnar nerves was measured simultaneously using three buckle force transducers during seven upper limb positions in the axilla of ten embalmed whole body human cadavers (n = 20 limbs).

Repeated measures analysis of variance (ANOVA) with Bonferroni post-hoc tests determined differences in tension between nerves and between limb positions. A Composite position consisting of ULNT2b (scapular depression, shoulder internal rotation, elbow extension, forearm pronation, wrist flexion) with the addition of shoulder abduction 40° and extension 25°, wrist ulnar deviation and thumb flexion demonstrated significantly greater tension of the radial nerve than any other tested position (mean tension 11.32N; 95% CI 10.25, 12.29, $p < 0.01$), including ULNT2b (2.20N; 1.84, 2.57; $p < 0.01$).

Additionally, the Composite position demonstrated the greatest difference in tension between the radial and median (mean difference 4.88N; 95% CI 3.16, 6.61; $p < 0.01$) and radial and ulnar nerves (9.26N, 7.54, 10.99; $p < 0.01$). This position constitutes a biomechanically plausible test to detect neuropathic pain related to the radial nerve.

Keywords: Brachial plexus, Mechanical stress, Peripheral nervous system diseases

48 B. TRIGGER POINTS NEEDLING

FMRI results for acupuncture

Brain network response to acupuncture stimuli in experimental acute low back pain: an fmri study

Abstract

Most neuroimaging studies have demonstrated that acupuncture can significantly modulate brain activation patterns in healthy subjects, while only a few studies have examined clinical pain. In

the current study, we combined an experimental acute low back pain (ALBP) model and functional magnetic resonance imaging (fMRI) to explore the neural mechanisms of acupuncture analgesia. All ALBP subjects first underwent two resting state fMRI scans at baseline and during a painful episode and then underwent two additional fMRI scans, once during acupuncture stimulation (ACUP) and once during tactile stimulation (SHAM) pseudorandomly, at the BL40 acupoint.

Our results showed that, compared with the baseline, the pain state had higher regional homogeneity (ReHo) values in the pain matrix, limbic system, and default mode network (DMN) and lower ReHo values in frontal gyrus and temporal gyrus; compared with the OFF status, ACUP yielded broad deactivation in subjects, including nearly all of the limbic system, pain status, and DMN, and also evoked numerous activations in the attentional and somatosensory systems; compared with SHAM, we found that ACUP induced more deactivations and fewer activations in the subjects. Multiple brain networks play crucial roles in acupuncture analgesia, suggesting that ACUP exceeds a somatosensory-guided mind-body therapy for ALBP.

Dry needling and LBP

Changes in lumbar multifidus muscle function and nociceptive sensitivity in low back pain patient responders versus non-responders after dry needling treatment

Shane L. Koppenhaver Michael J. Walker Jonathan Su Jared M. McGowen Michael D. Ross

Highlights

- Dry needling may facilitate lumbar multifidus contraction in patients with LBP.
- Dry needling may improve nociceptive sensitivity in patients with LBP.

- Responders to dry needling may exhibit different physiologic changes than non-responders.
- These sensorimotor changes may partially explain the mechanism of action of dry needling.

Abstract

Background

Little is known about the physiologic mechanism of dry needling. While some evidence suggests that dry needling may decrease nociceptive sensitivity and facilitate muscle function, no studies to date have examined these physiologic changes compared to clinical outcomes.

Objective

To examine changes in lumbar multifidus (LM) muscle function and nociceptive sensitivity after dry needling in patients with LBP and to determine if such changes differ in patients that exhibit improved disability (responders) and those that do not (non-responders).

Design

Quasi-experimental study.

Methods

Sixty-six volunteers with mechanical LBP (38 men, age = 41.3 ± 9.2 years) completed the study. Ultrasound measurements and pain algometry of the LM were taken at baseline and repeated immediately following dry needling treatment to the LM muscles and after one week. The percent change in muscle thickness from rest to contraction was calculated for each time point to represent muscle function. Pressure pain threshold (PPT) was used to measure nociceptive sensitivity. Participants were dichotomized as responders and non-responders based on whether or not they experienced clinical improvement using the modified Oswestry Disability Index after one week. 2×3 mixed-model ANOVA were conducted for group (responders vs. non-responders) by time.

Results

Patient responders exhibited larger improvements in LM muscle contraction and nociceptive sensitivity 1 week, but not immediately, after dry needling than non-responders.

Conclusions

Our results suggest that there may be lasting and clinically relevant sensorimotor changes that occur in LBP patients that improve with dry needling treatment that partially explain the physiologic mechanism of action.

Keywords: Acupuncture, Low back pain, Muscle contraction, Ultrasonography

49. STRETCHING

Yoga and anxiety and depression

J Affect Disord. 2015 Jun 24;184:310-317. doi: 10.1016/j.jad.2015.06.011.

Anti-anxiety efficacy of Sudarshan Kriya Yoga in general anxiety disorder: A multicomponent, yoga based, breath intervention program for patients suffering from generalized anxiety disorder with or without comorbidities.

Doria S¹, de Vuono A², Sanlorenzo R³, Irtelli F³, Mencacci C⁴.

Author information

Abstract

BACKGROUND:

Surdashan Kriya Yoga (SKY) is a procedure that in various studies, has shown evidences of efficacy in alleviating Depression and Anxiety disorders, but in Europe and USA it has not been studied yet on a Caucasian population as an adjunct therapy for psychiatric Disorders.

METHODS:

The study involved a sample of consenting women and men (n=69) who received SKY therapy for a six-month time period. They were assessed at recruitment, after two weeks, after three months and after six months using Hamilton Rating Scale for Anxiety (HRSA), Hamilton Rating Scale for Depression (HRSD), Zung Self-Rating Anxiety Scale (ZSAS), Zung Self-Rating Depression Scale (ZSDS) and Symptom Checklist-90 (SCL-90).

RESULTS:

All the analyses have shown that SKY therapy significantly reduces the scores of Anxiety and Depression. This is plain, especially after the initial SKY treatment, which is followed by a long plateau phase that seems to verge on no Anxiety/Depression scores. It was found that SKY effects lead to a significant convergence between the self-assessment (Zung Self-Rating Scale) and hetero-assessment (Hamilton Rating Scale).

LIMITATIONS:

The study should be replicated on a larger clinical sample in a controlled trial to learn more about the effectiveness of SKY Protocol.

CONCLUSIONS:

Participation in SKY adjunct therapy ten days intense workshop and follow-ups, coupled with daily individual and independent practice of a simplified protocol of breathing techniques (30min), can lead to significant reduction in levels of Anxiety and Depression.

KEYWORDS: Anxiety; Breathing techniques; Depression; Sudarshan Kriya Yoga; Yoga Therapy

PMID: 26142611

52. EXERCISE

Cervical exercises

Can neck exercises enhance the activation of the semispinalis cervicis relative to the splenius capitis at specific spinal levels?

Jochen Schomacher Joachim Erlenwein Angela Dieterich Frank Petzke Deborah Falla

Highlights

- Activation of the semispinalis cervicis can be emphasized relative to the splenius capitis at selected spinal levels.
- Isometric lower cervical spine extension emphasises the activation of semispinalis cervicis and splenius capitis at C5.
- Isometric resistance against traction/compression increases semispinalis cervicis and splenius capitis activation equally.

Abstract

The deep cervical extensor, semispinalis cervicis, displays changes in behaviour and structure in people with chronic neck pain yet there is limited knowledge on how activation of this muscle can be emphasized during training. Using intramuscular electromyography (EMG), this study investigated the activity of the deep semispinalis cervicis and the superficial splenius capitis muscle at two spinal levels (C2 and C5) in ten healthy volunteers during a series of neck exercises: 1. Traction and compression, 2. Resistance applied in either flexion or extension at the occiput, at the level of the vertebral arch of C1 and of C4, and 3. Maintaining the neck in neutral while inclined on the elbows, with and without resistance at C4. The ratio between semispinalis cervicis and the splenius capitis EMG amplitude was quantified as an indication of whether the exercise could emphasize the activation of the semispinalis cervicis muscle relative to the splenius capitis.

Manual resistance applied in extension over the vertebral arch emphasized the activation of the semispinalis cervicis relative to the splenius capitis at the spinal level directly caudal to the site of resistance (ratio: 2.0 ± 1.1 measured at C5 with resistance at C4 and 2.1 ± 1.2 measured at C2 with resistance at C1).

This study confirmed the possibility of emphasizing the activation of the semispinalis cervicis relative to the splenius capitis which may be relevant for targeted exercise interventions for this deep extensor muscle. Further studies are required to investigate the clinical efficacy of these exercises for people with neck pain.

Keywords: EMG, Semispinalis cervicis, Splenius capitis, Therapeutic exercise, Cervical spine

Hamstring specificity

Muscle and intensity based hamstring exercise classification in elite female track and field athletes: implications for exercise selection during rehabilitation

Background: Hamstring injuries are common in many sports, including track and field. Strains occur in different parts of the hamstring muscle but very little is known about whether common hamstring loading exercises specifically load different hamstring components. The purpose of this study was to investigate muscle activation of different components of the hamstring muscle

during common hamstring loading exercises.

Methods: Twenty elite female track and field athletes were recruited into this study, which had a single-sample, repeated-measures design. Each athlete performed ten hamstring loading exercises, and an electromyogram (EMG) was recorded from the biceps femoris and semitendinosus components of the hamstring. Hamstring EMG during maximal voluntary isometric contraction (MVIC) was used to normalize the mean data across ten repetitions of each exercise. An electrogoniometer synchronized to the EMG was used to determine whether peak EMG activity occurred during muscle-tendon unit lengthening, shortening, or no change in length. Mean EMG values were compared between the two recording sites for each exercise using the Student's t-test.

Results: The lunge, dead lift, and kettle swings were low intensity (<50% MVIC) and all showed higher EMG activity for semitendinosus than for biceps femoris. Bridge was low but approaching medium intensity, and the TRX, hamstring bridge, and hamstring curl were all medium intensity exercises ($\geq 50\%$ or $< 80\%$ MVIC). The Nordic, fitball, and slide leg exercises were all high intensity exercises. Only the fitball exercise showed higher EMG activity in the biceps femoris compared with the semitendinosus. Only lunge and kettle swings showed peak EMG in the muscle-tendon unit lengthening phase and both these exercises involved faster speed.

Conclusion: Some exercises selectively activated the lateral and medial distal hamstrings. Low, medium, and high intensity exercises were demonstrated. This information enables the clinician, strength and conditioning coach and physiotherapist to better understand intensity- and muscle-specific activation during hamstring muscle rehabilitation. Therefore, these results may help in designing progressive strengthening and rehabilitation and prevention programs.

Keywords: hamstring injuries, exercise, rehabilitation

Bone density and jumping

Bone. 2015 Jun 16;79:203-212. doi: 10.1016/j.bone.2015.06.008.

Effectiveness of resistance training or jumping-exercise to increase bone mineral density in men with low bone mass: A 12-month randomized, clinical trial.

Hinton PS¹, Nigh P², Thyfault J³.
Author information

Abstract

PURPOSE: To examine the effects of 12 mo of resistance training (RT, 2×/wk, N=19) or jump training (JUMP, 3×/wk, N=19) on bone mineral density (BMD) and bone turnover markers (BTM) in physically active (≥ 4 h/wk) men (mean age: 44 ± 2 y; median: 44 y) with osteopenia of the hip or spine.

METHODS: Participants rated pain and fatigue following each RT or JUMP session. All participants received supplemental calcium (1200mg/d) and vitamin D (10 μ g/d). BMD was measured at 0, 6, and 12 mo using DXA scans of the whole body (WB), total hip (TH) and lumbar spine (LS). BTM and 25 OHD were measured by ELISA. The effects of RT or JUMP on BMD and BTM were evaluated using 3x2 repeated measures ANOVA (time, group). This study was conducted in accordance with the Declaration of Helsinki and was approved by the University of Missouri IRB.

RESULTS: At baseline, 36 of 38 participants were vitamin D sufficient (25OHD >50 nmol/L); at 12 mo, all participants were 25OHD sufficient. 25OHD did not differ between groups. WB and LS BMD significantly increased after 6 months of RT or JUMP and this increase was maintained at 12 mo; TH BMD increased only in RT. Osteocalcin increased significantly after 12 mo of RT or JUMP; CTx decreased significantly after 6 mo and returned to baseline concentrations at 12 mo in both RT and JUMP. Pain and fatigue ratings after RT or JUMP sessions were very low at 0, 6, and 12 mo.

CONCLUSION: RT or JUMP, which appeared safe and feasible, increased BMD of the whole body and lumbar spine, while RT also increased hip BMD, in moderately active, osteopenic men.

KEYWORDS: Bone formation; Bone resorption; Bone turnover markers; Exercise intervention; Male osteopenia
PMID: 26092649

Tai Chi and the elderly

J Aging Phys Act. 2015 Jun 18

Evaluation of Tai Chi Program Effectiveness for People with Arthritis in the Community: A Randomized Controlled Trial.

Callahan LF¹, Cleveland RJ, Altpeter M, Hackney B.
Author information

Abstract

OBJECTIVE:

Evaluate effectiveness of the Arthritis Foundation Tai Chi program for community participants with arthritis.

METHODS:

343 individuals were randomized to intervention or wait-list control. Performance and self-reported outcome (SRO) measures were assessed at baseline and 8 weeks. At 1 year, SROs only were assessed. Adjusted means were determined using regression models adjusting for covariates and effect sizes (ES) calculated.

RESULTS:

Average participant age was 66 years, 87% were female and 87% Caucasian. Among 284 (83%) participants who returned at 8 weeks, balance by reach (ES=0.30) and helplessness, sleep, and role participation satisfaction (ES=0.24-0.54) improved significantly; pain, fatigue and stiffness improvement (ES=0.15-0.23) approached significance. No change was noted in mobility, lower-extremity strength, or single leg stance balance. At 1-year, improvements in pain, fatigue, stiffness, helplessness and role participation satisfaction at 8 weeks were maintained; 30% continued tai chi practice.

CONCLUSION:

Moderate effectiveness of the AF Tai Chi Program was confirmed.

PMID: 26099162

54. POSTURE

Sitting posture

The relationship between sitting posture and seated-related upper quadrant musculoskeletal pain in computing South African adolescents: A prospective study

Yolandi Brink Quinette Louw Karen Grimmer Esmè Jordaan

Manual Therapy DOI: <http://dx.doi.org/10.1016/j.math.2015.03.015>

Highlights

- Investigated sitting posture and musculoskeletal pain in computing adolescents.
- 34.2% of previously asymptomatic students developed musculoskeletal pain.
- Increased head flexion was predictive of seated-related musculoskeletal pain.
- Pain score increased 0.22 points with every 1° increase in head flexion.
- Findings applicable to small group of students with pain scores greater than 4.5.

Abstract

Background

There is evidence that consistent sitting for prolonged periods is associated with upper quadrant musculoskeletal pain (UQMP). It is unclear whether postural alignment is a significant risk factor.

Objective and design

The aim of the prospective study (2010–2011) was to ascertain if three-dimensional sitting postural angles, measured in a real-life school computer classroom setting, predict seated-related UQMP.

Method

Asymptomatic Grade 10 high-school students, aged 15–17 years, undertaking Computer Application Technology, were eligible to participate. Using the 3D Posture Analysis Tool, sitting posture was measured while students used desk-top computers. Posture was reported as five upper quadrant angles (Head flexion, Neck flexion; Craniocervical angle, Trunk flexion and Head lateral bending). The Computer Usage Questionnaire measured seated-related UQMP and hours of computer use. The Beck Depression Inventory and the Multidimensional Anxiety Scale for Children assessed psychosocial factors. Sitting posture, computer use and psychosocial factors were measured at baseline. UQMP was measured at six months and one-year follow-up.

Results

211, 190 and 153 students participated at baseline, six months and one-year follow-up respectively. 34.2% students complained of seated-related UQMP during the follow-up period. Increased head flexion (HF) predicted seated-related UQMP developing over time for a small group of students with pain scores greater than the 90th pain percentile, adjusted for age, gender, BMI, computer use and psychosocial factors ($p = 0.003$). The pain score increased 0.22 points per 1° increase in HF.

Conclusions

Classroom ergonomics and postural hygiene should therefore focus on reducing large HF angles among computing adolescents.

Keywords: Posture, Three-dimensional, Adolescent, Pain

Exercise and training impact on posture

The effects of training and detraining after an 8 month resistance and stretching training program on forward head and protracted shoulder postures in adolescents: Randomised controlled study

R.M. Ruivo A.I. Carita² P. Pizarat-Correia¹

Highlights

- A targeted exercise program can result in a posture improvement.

- A 4-month detraining period was not sufficient to reduce the postural training effects.
- Subjects with neck pain had a smaller cervical angle.
- Postural training is important to prevent upper quadrant musculoskeletal pain.

Abstract

Purpose

This study aimed to evaluate the effects of a 32-week resistance and stretching training program applied in Physical Education classes on forward head posture and protracted shoulder posture of Portuguese adolescents (15–17 years old). The detraining effects after a 16-week period were also measured.

Methods

This prospective, randomized and controlled study was conducted in two secondary schools in Portugal. One hundred and thirty adolescents with forward head and protracted shoulder posture were randomly assigned to a control or experimental group. The sagittal head, cervical and shoulder angle were measured before and after a 32-week time intervention period. The control group (n = 46) did only the Physical Education classes whereas the exercise group (n = 42) received a posture corrective exercise programme in addition to Physical Education classes. A 16 week detraining period followed the 32-week.

Results

Significant increase were observed in the cervical and shoulder angle in the experimental group following the 32 week-intervention period. After the 16-week detraining period no significant differences were observed in the three postural angles in the intervention group.

Conclusions

The exercise intervention was successful at decreasing forward head and protracted shoulder in adolescents. Detraining period was not sufficient to reduce the overall training effects. This study supports the postural training and rehabilitation performed during Physical Education classes, with the aim of preventing and managing upper quadrant musculoskeletal pain.

ClinicalTrials.gov Identifier

NCT02190331.

Keywords: Detraining, Neck, Posture, Rehabilitation

Cervical fusion and changes in sagittal posture

Yenisei Med J. 2015 Jul;56(4):1060-1070. English.

Published online Jun 05, 2015. <http://dx.doi.org/10.3349/ymj.2015.56.4.1060>

Anterior Cervical Discectomy and Fusion Alters Whole-Spine Sagittal Alignment

Jang Hoon Kim,¹ Jeong Yoon Park,¹ Seong Yi,² Kyung Hyun Kim,¹ Sung Uk Kuh,¹ Dong Kyu Chin,¹ Keun Su Kim,¹ and Yong Eun Cho¹

Purpose

Anterior cervical discectomy and fusion (ACDF) has become a common spine procedure, however, there have been no previous studies on whole spine alignment changes after cervical fusion. Our purpose in this study was to determine whole spine sagittal alignment and pelvic alignment changes after ACDF.

Materials and Methods

Forty-eight patients who had undergone ACDF from January 2011 to December 2012 were enrolled in this study. Cervical lordosis, thoracic kyphosis, lumbar lordosis, sagittal vertical axis (SVA), and pelvic parameters were measured preoperatively and at 1, 3, 6, and 12 months postoperatively. Clinical outcomes were assessed using Visual Analog Scale (VAS) scores and Neck Disability Index (NDI) values.

Results

Forty-eight patients were grouped according to operative method (cage only, cage & plate), operative level (upper level: C3/4 & C4/5; lower level: C5/6 & C6/7), and cervical lordosis (high lordosis, low lordosis). All patients experienced significant improvements in VAS scores and NDI values after surgery. Among the radiologic parameters, pelvic tilt increased and sacral slope decreased at 12 months postoperatively. Only the high cervical lordosis group showed significantly-decreased cervical lordosis and a shortened SVA postoperatively. Correlation tests revealed that cervical lordosis was significantly correlated with SVA and that SVA was significantly correlated with pelvic tilt and sacral slope.

Conclusion

ACDF affects whole spine sagittal alignment, especially in patients with high cervical lordosis. In these patients, alteration of cervical lordosis to a normal angle shortened the SVA and resulted in reciprocal changes in pelvic tilt and sacral slope.

Keywords: ACDF, whole spine sagittal alignment, pelvic parameters.

Sitting and standing posture in infants

Spine (Phila Pa 1976). 2015 Mar 17.

The Evolution Of Sagittal Spinal Alignment In Sitting Position During Childhood.

Kamac S¹, Yücekul A, Demirkran G, Berktaş M, Yazc M.

Author information

Abstract

STUDY DESIGN:

This is a cross-sectional descriptive study.

OBJECTIVE:

The purposes of this study are to describe normative data of the sagittal plane in the sitting position within the pediatric population and document the evolution of sagittal alignment during the growth. Summary of Background Data. Surgical procedures addressing the deformity aim to make the maximal correction on the coronal and transverse planes and to restore the physiologic curves on the sagittal plane. Prerequisite for sagittal plane reconstruction is to know the physiologic values.

METHODS:

Children between 3-17 years followed by pediatrics unit for non-skeleton disease with lateral x-rays of the entire spine and pelvis on sitting positions were included to the study. Children with history of surgery or disease those may affect spine development were excluded. Children were evaluated in 4 age groups (3-6, 7-9, 10-12 and 13-17 years) in terms of spinal sagittal alignment on sitting position.

RESULTS:

Of the screened, 124 children (49 girls, 75 boys) were included. Descriptive statistics of all possible segmental angles were summarized. Thoracic kyphosis and lumbar lordosis values were lower on sitting position than the standing. Thoracic segmental angulations steadily increased from T1-T2 to mid-thoracic segments and then decreased in caudal direction. Moreover, lumbar segmental angulations steadily increased in cephalo-caudal direction. Sacral slope, L4-S1 angulation, T1-T12 and T1-S1 distance tends to increase as the age increases.

Conclusion. Sagittal spinal alignment in the sitting position is different than that in the standing position and it changes as the child grows. There is a statistically significant difference between different age groups, especially at the cervicothoracic, thoracolumbar, and lumbosacral junctions. These findings should be taken into consideration for young non-ambulatory patients who require spinal instrumentation and/or fusion.

PMID: 25785958

55. SCOLIOSIS

Prediction of curve progression

Spine: 01 July 2015 - Volume 40 - Issue 13 - p 1006–1013 doi: 10.1097/BRS.0000000000000952

Deformity Prediction of Curve Progression in Idiopathic Scoliosis: Validation of the Sanders Skeletal Maturity Staging System

Sitoula, Prakash MBBS, MS (Ortho)*; Verma, Kushagra MD†; Holmes, Laurens Jr PhD, DrPH*; Gabos, Peter G. MD*,†; Sanders, James O. MD‡; Yorgova, Petya MS*; Neiss, Geraldine PhD*; Rogers, Kenneth PhD, ATC*; Shah, Suken A. MD*,†

Objective. This study aimed to validate the Sanders Skeletal Maturity Staging System and to assess its correlation to curve progression in idiopathic scoliosis.

Summary of Background Data. The Sanders Skeletal Maturity Staging System has been used to predict curve progression in idiopathic scoliosis. This study intended to validate that initial study with a larger sample size.

Methods. We retrospectively reviewed 1100 consecutive patients with idiopathic scoliosis between 2005 and 2011. Girls aged 8 to 14 years (<2 yr postmenarche) and boys aged 10 to 16 years who had obtained at least 1 hand and spine radiograph on the same day for evaluation of skeletal age and scoliosis curve magnitude were followed to skeletal maturity (Risser stage 5 or fully capped Risser stage 4), curve progression to 50° or greater, or spinal fusion. Patients with nonidiopathic curves were excluded.

Results. There were 161 patients: 131 girls (12.3 ± 1.2 yr) and 30 boys (13.9 ± 1.1 yr). The distribution of patients within Sanders stage (SS) 1 through 7 was 7, 28, 41, 45, 7, 31, and 2 patients, respectively; modified Lenke curve types 1 to 6 were 26, 12, 63, 5, 38, and 17 patients, respectively. All patients in SS2 with initial Cobb angles of 25° or greater progressed, and patients in SS1 and SS3 with initial Cobb angles of 35° or greater progressed. Similarly, all patients with initial Cobb angles of 40° or greater progressed except those in SS7. Conversely, none of the patients with initial Cobb angles of 15° or less or those in SS5, SS6, and SS7 with initial Cobb angles of 30° or less progressed. Predictive progression of 67%, 50%, 43%, 27%, and 60% was observed for subgroups SS1/30°, SS2/20°, SS3/30°, SS4/30°, and SS6/35° respectively.

Conclusion. This larger cohort shows a strong predictive correlation between SS and initial Cobb angle for probability of curve progression in idiopathic scoliosis.

Level of Evidence: 3

Motion sickness

Eur Spine J. 2015 Jun 16.

Evaluation of motion sickness susceptibility by motion sickness susceptibility questionnaire in adolescents with idiopathic scoliosis: a case-control study.

Catanzariti JF¹, Guyot MA, Massot C, Khenioui H, Agnani O, Donzé C.

Author information

Abstract

PURPOSE:

Adolescent idiopathic scoliosis (AIS) is a three-dimensional deformity of the spine, with unknown origin. Some studies have noted impaired postural balance in AIS, in particular, difficulty to manage situations with sensory conflict. The motion sickness susceptibility can be secondary to a sensory conflict, for example, between visual and vestibular information. Our hypothesis is: patients with AIS have difficulty in managing situations with sensory conflict and therefore have increased motion sickness susceptibility. The purpose of this study was to evaluate in AIS subjects by evaluating their susceptibility to motion sickness, as compared to a control group.

METHODS:

We conducted an analysis of data on motion sickness susceptibility collected prospectively from 2012, with the B score of motion sickness susceptibility questionnaire. This evaluation was completed for 65 adolescents (age 14.5 ± 1.6 year) with major right thoracic AIS (Cobb = $40.7^\circ \pm 13.1^\circ$) and 71 matched controls (14.6 ± 1.6 year).

RESULTS:

Adolescents with major right thoracic AIS were more susceptible to motion sickness (B score = 5.3 ± 5.8) than controls (B score = 3.4 ± 3.7) with significant difference ($p = 0.025$).

CONCLUSIONS:

We interpret our results suggesting there is difficulty for patients with AIS to manage situations with sensory conflict. Previous studies focusing on situations with sensory conflict in AIS have required sophisticated technology. They are not accessible for routine patient management. Our research shows the same result with simple, non invasive, low-cost and quick method: B score of motion sickness susceptibility questionnaire.

PMID: 26077100

56. ATHLETICS

Cardiac deaths in college athletes

Circulation. 2015 Jul 7;132(1):10-9. doi: 10.1161/CIRCULATIONAHA.115.015431. Epub 2015 May 14.

Incidence, Cause, and Comparative Frequency of Sudden Cardiac Death in National Collegiate Athletic Association Athletes: A Decade in Review.

Harmon KG¹, Asif IM², Maleszewski JJ², Owens DS², Prutkin JM², Salerno JC², Zigman ML², Ellenbogen R², Rao AL², Ackerman MJ², Drezner JA².

Author information

Abstract

BACKGROUND:

The incidence and cause of sudden cardiac death (SCD) in athletes is debated with hypertrophic cardiomyopathy often reported as the most common cause.

METHODS AND RESULTS:

A database of all National Collegiate Athletic Association deaths (2003-2013) was developed. Additional information and autopsy reports were obtained when possible. Cause of death was adjudicated by an expert panel. There were 4 242 519 athlete-years (AY) and 514 total student athlete deaths. Accidents were the most common cause of death (257, 50%, 1:16 508 AY) followed by medical causes (147, 29%, 1:28 861 AY). The most common medical cause of death was SCD (79, 15%, 1:53 703 AY). Males were at higher risk than females 1:37 790 AY versus 1:121 593 AY (incidence rate ratio, 3.2; 95% confidence interval, 1.9-5.5; P<0.00001), and black athletes were at higher risk than white athletes 1:21491 AY versus 1:68 354 AY (incidence rate ratio, 3.2; 95% confidence interval, 1.9-5.2; P<0.00001). The incidence of SCD in Division 1 male basketball athletes was 1:5200 AY. The most common findings at autopsy were autopsy-negative sudden unexplained death in 16 (25%), and definitive evidence for hypertrophic cardiomyopathy was seen in 5 (8%). Media reports identified more deaths in higher divisions (87%, 61%, and 44%), whereas the percentages from the internal database did not vary (87%, 83%, and 89%). Insurance claims identified only 11% of SCDs.

CONCLUSIONS:

The rate of SCD in National Collegiate Athletic Association athletes is high, with males, black athletes, and basketball players at substantially higher risk. The most common finding at autopsy is autopsy-negative sudden unexplained death. Media reports are more likely to capture high-profile deaths, and insurance claims are not a reliable method for case identification.

KEYWORDS: athletes; death; epidemiology; pathology; sudden

PMID: 25977310

Kinesio taping and vertical jump

Kinesiology tape does not promote vertical jumping performance: A deceptive crossover trial

R.T.H. Cheung Q.K.C. Yau K. Wong P. Lau A. So N. Chan C. Kwok K.Y. Poon P.S.H. Yung

Highlights

- This study examined the true effect of kinesiology tape on functional performance.
- Tape application did not promote vertical jump height or jump power in volleyball players.
- Kinesiology tape should not be considered for performance enhancement.
- These findings are based on athletes without injury and immediate effects only.

Abstract

Background

Kinesiology tape (KINTAPE) is one of the most common adhesive therapeutic tapes. Apart from clinical applications, KINTAPE claims to be able to enhance functional performance by muscle activity facilitation. However, emerging evidence suggests that the isokinetic muscle strength remains similar when the placebo effect is eliminated.

Objectives

In view of the weak relationship between functional performance and isokinetic muscle strength, this study investigated the true effects of KINTAPE on functional performance.

Design

Deceptive, randomized, and crossover trial.

Method

Sixty four experienced volleyball players performed vertical jumping test under three taping conditions: true facilitative KINTAPE, sham KINTAPE, and no KINTAPE. Under the pretense of applying adhesive muscle sensors, KINTAPE was applied to their quadriceps and gastrocnemius in the first two conditions. Mean maximum jump height and peak jump power were averaged from three attempts. Within-subject comparisons were conducted by repeated measure ANOVA.

Results

Out of 64 participants, 30 of them were successfully deceived and they were ignorant about KINTAPE. No significant differences were found in both maximum jump height ($\eta^2 = 0.001$; $p = 0.241$) and peak jump power ($\eta^2 = 0.001$; $p = 0.134$) between three taping conditions.

Conclusions

The results showed that KINTAPE did not facilitate muscle performance by generating higher jumping power or yielding a better jumping performance. These findings reinforce that previously reported muscle facilitatory effects or functional enhancement using KINTAPE may be attributed to placebo effects.

Keywords: Power, Jump height, Placebo

Double poling

Med Sci Sports Exerc. 2015 Jun 24.

Mechanical Energy and Propulsion in Ergometer Double Poling by Cross-country Skiers.

Danielsen J¹, Sandbakk Ø, Holmberg HC, Ettema G.

Author information

Abstract

PURPOSE:

To investigate fluctuations in the total mechanical energy of the body (Ebody) in relation to the external ergometer work (Werg) during the poling and recovery phases of simulated double poling cross-country skiing.

METHODS:

Nine male cross-country skiers (age 24 ± 5 yrs, body mass 81.7 ± 6.5 kg) performed 4-min submaximal tests at low, moderate, and high intensity levels and a 3-min all-out test on a ski ergometer. Motion capture analysis and load cell recordings were used to measure body kinematics and dynamics. From these, Werg and Ebody, which is the sum of the translational, rotational and gravitational potential energies of all segments, as well as their time differentials (power, P) were calculated. P_{tot}, interpreted as the rate of energy absorption or generation by muscle-tendons, was defined as the sum of P_{body} and P_{erg}.

RESULTS:

Ebody showed large fluctuations over the movement cycle, decreasing during poling and increasing during the recovery phase. The fluctuation in P_{body} was almost perfectly out-of-phase with P_{erg}. Some muscle-tendon energy absorption was observed at the onset of poling. For the rest of poling and throughout the recovery phase, muscle-tendons generated energy both to do Werg and to increase Ebody. Approximately 50 % of cycle P_{tot} was done during recovery for all intensity levels.

CONCLUSIONS:

In double poling, the extensive contribution of the lower extremities and trunk to whole-body muscle-tendon work during recovery facilitates a "direct" transfer of Ebody to do Werg during the poling phase. This observation reveals that double poling involves a unique movement pattern, different from most other forms of legged terrestrial locomotion which are characterized primarily by inverted pendulum or spring-mass types of movement.

PMID: 26110695

57. GAIT**Barefoot and common footwear****Barefoot vs Common Footwear: A systematic review of the kinematic, kinetic and muscle activity differences during walking**

Simon Franklin Michael J. Grey Nicola Heneghan Laura Bowen François-Xavier

Highlights

- Footwear can constrict the structure and function of the foot.
- Short and long term use of footwear affects the kinematics and kinetics of gait.
- Habitual barefoot walkers show considerable anatomical and functional differences.
- Differences in gait mechanics observed between different age groups.
- Research required in older age to understand effect of footwear across the lifespan.

Abstract

Habitual footwear use has been reported to influence foot structure with an acute exposure being shown to alter foot position and mechanics. The foot is highly specialised thus these changes in structure/position could influence functionality. This review aims to investigate the effect of footwear on gait, specifically focussing on studies that have assessed kinematics, kinetics and muscle activity between walking barefoot and in common footwear. In line with PRISMA and published guidelines, a literature search was completed across six databases comprising Medline, EMBASE, Scopus, AMED, Cochrane Library and Web of Science. Fifteen of 466 articles met the predetermined inclusion criteria and were included in the review.

All articles were assessed for methodological quality using a modified assessment tool based on the STROBE statement for reporting observational studies and the CASP appraisal tool. Walking barefoot enables increased forefoot spreading under load and habitual barefoot walkers have anatomically wider feet. Spatial-temporal differences including, reduced step/stride length and increased cadence, are observed when barefoot. Flatter foot placement, increased knee flexion and a reduced peak vertical ground reaction force at initial contact are also reported. Habitual barefoot walkers exhibit lower peak plantar pressures and pressure impulses, whereas peak plantar pressures are increased in the habitually shod wearer walking barefoot.

Footwear particularly affects the kinematics and kinetics of gait acutely and chronically. Little research has been completed in older age populations (50+ years) and thus further research is required to better understand the effect of footwear on walking across the lifespan.

Keywords: Barefoot, Footwear, Walking, Kinematics, Kinetics

59. PAIN

Sleep and chronic pain

A particular effect of sleep, but not pain or depression, on the blood-oxygen-level dependent response during working memory tasks in patients with chronic pain

Authors Elvemo NA, Landrø NI, Borchgrevink PC, Håberg AK

Background: Patients with chronic pain (CP) are often reported to have deficits in working memory. Pain impairs working memory, but so do depression and sleep problems, which are also common in CP. Depression has been linked to changes in brain activity in CP during working memory tasks, but the effect of sleep problems on working memory performance and brain activity remains to be investigated.

Methods: Fifteen CP patients and 17 age-, sex-, and education-matched controls underwent blood-oxygen-level dependent (BOLD) functional magnetic resonance imaging at 3T while performing block design 0-back, 2-back, and paced visual serial addition test paradigms. Subjects also reported their level of pain (Brief Pain Inventory), depression (Beck Depression Inventory II), and sleep problems (Pittsburgh Sleep Quality Index) and were tested outside the scanner with neuropsychological tests of working memory.

Results: The CP group reported significantly higher levels of pain, depression, and sleep problems. No significant performance difference was found on the neuropsychological tests in or outside the scanner between the two groups. There were no correlations between level of pain, depression, and sleep problems or between these and the neuropsychological test scores. CP patients exhibited significantly less brain activation and deactivation than controls in parietal and frontal lobes, which are the brain areas that normally show activation and deactivation during working memory tasks. Sleep problems independently and significantly modulated the BOLD response to the complex working memory tasks and were associated with decreased brain activation in task-positive regions and decreased deactivation in the default mode network in the CP group compared to the control group. The pain and depression scores covaried with working memory activation.

Discussion: Sleep problems in CP patients had a significant impact on the BOLD response during working memory tasks, independent of pain level and depression, even when performance was shown not to be significantly affected.

Keywords: magnetic resonance imaging, 2-back, serial addition test, deactivation, activation

Geriatric chronic pain

Geriatr Gerontol Int. 2015 Jun 16. doi: 10.1111/ggi.12539.

Living arrangements, social networks and onset or progression of pain among older adults in Singapore.

Leung YY^{1,2}, Teo SL³, Chua MB², Raman P¹, Liu C¹, Chan A¹.

Author information

Abstract

AIMS:

We aimed to evaluate the relationship between living arrangements, and strength of social network with onset and progression of chronic pain over 2 years in elderly Singaporeans.

METHODS:

We used data from the Social Isolation Health and Lifestyles Survey, a nationally representative survey of community-dwelling older Singaporeans aged >60 years (n = 4990) in 2009 and follow up in 2011. We used binomial logistic regression models to examine factors associated with self-reported onset and progression of chronic pain over time.

RESULTS:

A total of 3103 participants (53.8% women) completed both surveys (weighted response rate 63.7%). The mean age (SD) was 69.4 (0.5) years. The prevalence of mild and moderate-extreme chronic pain at baseline were 27.7% and 12.8%. A total of 20.1% and 3.9% of the participants reported having chronic pain onset and progression over 2 years, respectively. In the binomial regression models, lower education level, living alone and poorer self-rated health were predictors for onset of chronic pain in women. Weak social networks and disability were associated with progression of chronic pain in women.

CONCLUSIONS:

Chronic pain is common in Singaporean older adults. Living alone and weak social network were sociopsychological factors associated with the onset or progression of chronic pain. *Geriatr Gerontol Int* 2015; ●●: ●●-●●.

KEYWORDS: Singapore elderly; chronic pain; cohort study; pain progression; social isolation; social network
PMID: 26081796

Importance of placebos**The importance of placebos to medical care**

Beth Israel Deaconess Medical Center, 07/06/2015

The “placebo effect” is often described as events that occur when patients show improvement from treatments that contain no active ingredients. While placebos have been used to ease pain

and other symptoms for centuries and are used in clinical trials as controls for testing new drug therapies, the biology underlying placebo effects has only recently been truly appreciated. A “Perspectives” article in the July 2 issue of The New England Journal of Medicine (NEJM) proposes that placebo effects be more broadly defined as outcomes that develop from patients’ participation in a clinical encounter and, thus, a valuable component of medical care and important tool to relieve symptoms and help patients feel better. “Recent scientific advances have enabled us to identify a trove of neurotransmitters and detect relevant neural brain pathways as well as genetic markers that help explain the biology of the placebo effect,” said Kaptchuk.

At the same time, he adds, clinical studies on migraine headache, asthma, chronic pain and irritable bowel syndrome have demonstrated the important role of the placebo in helping relieve symptoms of these often debilitating conditions.

Pain education a new approach

Phys Ther. 2015 Apr 16.

Theoretical Considerations for Chronic Pain Rehabilitation.

Lotze M¹, Moseley GL².

Author information

Abstract

Conventional rehabilitation of patients with chronic pain is often not successful and is frustrating for the treatment team. However, theoretical developments and substantial advances in our understanding of the neurological aspects of chronic pain are changing these experiences. Modern theoretical models of pain consider it a perceptual inference that reflects a "best guess" that protective action is required. This article argues that keen observation and open and respectful clinician-patient and scientist-clinician relationships have been critical for the emergence of effective rehabilitation approaches and will be critical for further improvements.

The role in modern pain rehabilitation of reconceptualizing the pain itself by "Explaining Pain," careful and intentional observation of the person in pain, and the strategic and constant communication of safety is emphasized. It also is suggested that better understanding of the neural mechanisms underpinning chronic pain has directly informed the development of new therapeutic approaches, which are being further refined and tested.

Conventional pain treatment, where the clinician strives to find the pain-relieving medication or exercise, or pain management, where the clinician helps the patient to manage life despite unabating pain, is being replaced by pain rehabilitation, where a truly biopsychosocial approach allows clinicians to provide patients with the knowledge, understanding, and skills to reduce both their pain and disability. A brief overview is provided of the key aspects of modern pain rehabilitation and the considerations that should lead our interaction with patients with chronic pain.

PMID: 25882484

61. FIBROMYALGIA

Use of sounds

Effects of listening to music versus environmental sounds in passive and active situations on levels of pain and fatigue in fibromyalgia

Pain Management Nursing, 07/10/2015

Mercad e L, et al. – In fibromyalgia, pain symptoms such as hyperalgesia and allodynia are associated with fatigue. Mechanisms underlying such symptoms can be modulated by listening to pleasant music. This improvement persisted 10 minutes after the end of the listening session. In active situations, pain did not increase in presence of the two stimuli. Contrary to the authors' expectations, music and environmental sounds produced a similar relieving effect on pain and fatigue, with no benefit gained by listening to pleasant music over environmental sounds.

Methods

- The authors carried out a 4-week study in which patients with fibromyalgia listened to either preselected musical pieces or environmental sounds when they experienced pain in active (while carrying out a physical activity) or passive (at rest) situations.
- Concomitant changes of pain and fatigue levels were evaluated.

Results

- When patients listened to music or environmental sounds at rest, pain and fatigue levels were significantly reduced after 20 minutes of listening, with no difference of effect magnitude between the two stimuli.
- This improvement persisted 10 minutes after the end of the listening session.
- In active situations, pain did not increase in presence of the two stimuli.

62 A. NUTRITION/VITAMINS

High glycemic diet and depression

High glycemic index diet as a risk factor for depression: analyses from the Women's Health Initiative.

Gangwisch JE¹, Hale L², Garcia L³, Malaspina D⁴, Opler MG⁴, Payne ME⁵, Rossom RC⁶, Lane D⁷.

Author information

Abstract

BACKGROUND:

The consumption of sweetened beverages, refined foods, and pastries has been shown to be associated with an increased risk of depression in longitudinal studies. However, any influence that refined carbohydrates has on mood could be commensurate with their proportion in the overall diet; studies are therefore needed that measure overall intakes of carbohydrate and sugar, glycemic index (GI), and glycemic load.

OBJECTIVE:

We hypothesized that higher dietary GI and glycemic load would be associated with greater odds of the prevalence and incidence of depression.

DESIGN:

This was a prospective cohort study to investigate the relations between dietary GI, glycemic load, and other carbohydrate measures (added sugars, total sugars, glucose, sucrose, lactose, fructose, starch, carbohydrate) and depression in postmenopausal women who participated in the Women's Health Initiative Observational Study at baseline between 1994 and 1998 (n = 87,618) and at the 3-y follow-up (n = 69,954).

RESULTS:

We found a progressively higher dietary GI to be associated with increasing odds of incident depression in fully adjusted models (OR for the fifth vs. first quintile: 1.22; 95% CI: 1.09, 1.37), with the trend being statistically significant (P = 0.0032). Progressively higher consumption of dietary added sugars was also associated with increasing odds of incident depression (OR for the fifth vs. first quintile: 1.23; 95% CI: 1.07, 1.41; P-trend = 0.0029). Higher consumption of lactose, fiber, nonjuice fruit, and vegetables was significantly associated with lower odds of incident depression, and nonwhole/refined grain consumption was associated with increased odds of depression.

CONCLUSIONS:

The results from this study suggest that high-GI diets could be a risk factor for depression in postmenopausal women. Randomized trials should be undertaken to examine the question of whether diets rich in low-GI foods could serve as treatments and primary preventive measures for depression in postmenopausal women. The Women's Health Initiative is registered at clinicaltrials.gov as NCT00000611.

KEYWORDS: depression; epidemiology; glycemic index; glycemic load; postmenopausal women

PMID:26109579

Dietary intake and activity in adolescents

Obes Rev. 2015 Jun 22. doi: 10.1111/obr.12302.

Is the relationship between sedentary behaviour and cardiometabolic health in adolescents independent of dietary intake? A systematic review.

Fletcher E¹, Leech R¹, McNaughton SA¹, Dunstan DW^{1,2,3,4,5,6}, Lacy KE¹, Salmon J¹.

Author information

Abstract

Screen time, but not overall sedentary behaviour, is consistently related to cardiometabolic health in adolescents. Because of the associations screen time has with dietary intake, diet may be an important factor in the screen time and health relationship; however, evidence has not previously been synthesized. Thus, the aim of this systematic review was to explore whether the associations between various sedentary behaviours and cardiometabolic risk markers are independent of dietary intake in adolescents. Online databases and personal libraries were searched for peer-reviewed original research articles published in English before March 2014. Included studies assessed associations between sedentary behaviour and cardiometabolic markers in 12- to 18-year-olds and adjusted for dietary intake. Twenty-five studies met the inclusion criteria.

From the 21 studies examining sedentary behaviour and adiposity, the majority found significant positive associations between television viewing, screen time and self-reported overall sedentary behaviour with markers of adiposity, independent of dietary intake. No significant associations between screen time with blood pressure and cholesterol were reported.

Sedentary behaviour appears to be associated with adiposity in adolescents, irrespective of dietary intake. However, the variability of dietary variables between studies suggests further work is needed to understand the role of dietary intake when examining these associations in youth.

KEYWORDS: Adolescents; cardiometabolic; diet; screen time

PMID: 26098509

Wheat sensitivity

Int J Dermatol. 2015 Jun 20. doi: 10.1111/ijd.12767.

Eighteen cases of wheat allergy and wheat-dependent exercise-induced urticaria/anaphylaxis sensitized by hydrolyzed wheat protein in soap.

Kobayashi T¹, Ito T¹, Kawakami H¹, Fuzishiro K¹, Hirano H¹, Okubo Y¹, Tsuboi R¹.

Author information

Abstract

BACKGROUND:

Glupearl 19S, an acid-hydrolyzed wheat protein (HWP), is used widely in Japan as a moisturizing ingredient in facial soaps. Since 2010, there has been an increasing number of reports of contact urticaria and wheat allergy resulting from the use of products containing this substance.

CASE REPORTS:

Sixty-one patients who had used HWP-containing facial soap visited our hospital. Thirty-five of these experienced urticaria or anaphylaxis after consuming wheat-containing food.

RESULTS:

Eighteen of the 35 patients tested positive to 0.01% Glupearl 19S solution. Wheat-specific IgE and serum gluten-specific IgE were higher in the patients with HWP allergy than in non-HWP allergy patients. Among the patients who tested positive to Glupearl 19S on the skin prick test, nine experienced HWP-wheat-dependent exercise-induced anaphylaxis, and four experienced food-dependent anaphylaxis. Moreover, four of these patients not only experienced food-dependent anaphylaxis but also a worsening of the symptoms during exercise.

DISCUSSION:

The clinical symptomology was so variable that the patients were classified into six groups. We found that patients with HWP allergy tended to manifest symptoms of both HWP-wheat-dependent exercise-induced anaphylaxis and contact urticaria. The etiology of hydrolyzed wheat protein allergy is unknown. Patients with a history of these symptoms need to be informed about the risk of consuming wheat-containing foods and the importance of excluding such items from their diet.

PMID: 26096789

63. PHARMACOLOGY

Medical Marijuana

JAMA. 2015 Jun 23-30;313(24):2474-83. doi: 10.1001/jama.2015.6199.

Medical Marijuana for Treatment of Chronic Pain and Other Medical and Psychiatric Problems: A Clinical Review.Hill KP¹.

Author information

Abstract

IMPORTANCE:

As of March 2015, 23 states and the District of Columbia had medical marijuana laws in place. Physicians should know both the scientific rationale and the practical implications for medical marijuana laws.

OBJECTIVE:

To review the pharmacology, indications, and laws related to medical marijuana use.

EVIDENCE REVIEW:

The medical literature on medical marijuana was reviewed from 1948 to March 2015 via MEDLINE with an emphasis on 28 randomized clinical trials of cannabinoids as pharmacotherapy for indications other than those for which there are 2 US Food and Drug Administration-approved cannabinoids (dronabinol and nabilone), which include nausea and vomiting associated with chemotherapy and appetite stimulation in wasting illnesses.

FINDINGS:

Use of marijuana for chronic pain, neuropathic pain, and spasticity due to multiple sclerosis is supported by high-quality evidence. Six trials that included 325 patients examined chronic pain, 6 trials that included 396 patients investigated neuropathic pain, and 12 trials that included 1600 patients focused on multiple sclerosis. Several of these trials had positive results, suggesting that marijuana or cannabinoids may be efficacious for these indications.

CONCLUSIONS AND RELEVANCE:

Medical marijuana is used to treat a host of indications, a few of which have evidence to support treatment with marijuana and many that do not. Physicians should educate patients about medical marijuana to ensure that it is used appropriately and that patients will benefit from its use.

PMID: 26103031

65. NEUROLOGICAL CONDITIONS**Parkinson disease**

Eur J Pain. 2015 Jul 6. doi: 10.1002/ejp.745.

Sensory abnormalities and pain in Parkinson disease and its modulation by treatment of motor symptoms.

Cury RG^{1,2,3}, Galhardoni R¹, Fonoff ET^{1,4,5}, Perez Lloret S⁶, Dos Santos Ghilardi MG⁵, Barbosa ER³, Teixeira MJ^{1,2,3,4,5}, Ciampi de Andrade D^{1,2,4}.

Author information

Abstract

Pain and sensory abnormalities are present in a large proportion of Parkinson disease (PD) patients and have a significant negative impact in quality of life. It remains undetermined whether pain occurs secondary to motor impairment and to which extent it can be relieved by improvement of motor symptoms. The aim of this review was to examine the current knowledge on the mechanisms behind sensory changes and pain in PD and to assess the modulatory effects of motor treatment on these sensory abnormalities. A comprehensive literature search was performed. We selected studies investigating sensory changes and pain in PD and the effects of levodopa administration and deep brain stimulation (DBS) on these symptoms. PD patients have altered sensory and pain thresholds in the off-medication state. Both levodopa and DBS improve motor symptoms (i.e.: bradykinesia, tremor) and change sensory abnormalities towards normal levels. However, there is no direct correlation between sensory/pain changes and motor improvement, suggesting that motor and non-motor symptoms do not necessarily share the same mechanisms. Whether dopamine and DBS have a real antinociceptive effect or simply a modulatory effect in pain perception remain uncertain.

These data may provide useful insights into a mechanism-based approach to pain in PD, pointing out the role of the dopaminergic system in pain perception and the importance of the characterization of different pain syndromes related to PD before specific treatment can be instituted.

PMID: 26147660