ABSTRACTS

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1. LUMBAR SPINE

Bone mineralization

BMC Med Imaging. 2016 Feb 24;16(1):17. doi: 10.1186/s12880-016-0123-2.

Correlation between degenerative spine disease and bone marrow density: a retrospective investigation.

Grams AE[1], Rehwald R[2], Bartsch A[3], Honold S[4], Freyschlag CF[5], Knoflach M[6], Gizewski ER[7], Glodny B[8].

Abstract

BACKGROUND:

Spondylosis leads to an overestimation of bone mineral density (BMD) with dual-energy x-ray absorptiometry (DXA) but not with quantitative computed tomography (QCT). The correlation between degenerative changes of the spine and QCT-BMD was therefore investigated for the first time.

METHODS:

One hundred thirty-four patients (66 female and 68 male) with a mean age of 49.0 ± 14.6 years (range: 19-88 years) who received a CT scan and QCT-BMD measurements of spine and hip were evaluated retrospectively. The occurrence and severity of spondylosis, osteochondrosis, and spondylarthrosis and the height of the vertebral bodies were assessed.

RESULTS:

A negative correlation was found between spinal BMD and number of spondylophytes ($\rho = -0.35$; $p < 0.01$), disc heights ($r = -0.33$; $p < 0.01$), number of discal air inclusions ($\rho = -0.34$; $p < 0.01$), the number of Schmorl nodules ($\rho = -0.25$; $p < 0.01$), the number ($\rho = -0.219$; $p < 0.05$) and the degree ($\rho = -0.220$; $p < 0.05$) of spondylarthrosis. Spinal and hip BMD correlated moderately, but the latter did not correlate with degenerative changes of the spine. In linear regression models age, osteochondrosis and spondylarthrosis were factors influencing spinal BMD.

CONCLUSION:

Degenerative spinal changes may be associated with reduced regional spinal mineralization. This knowledge could lead to a modification of treatment of degenerative spine disease with early treatment of osteopenia to prevent secondary fractures.

PMID: 26911278

Ligament stiffness

BMC Musculoskelet Disord. 2016 Feb 22;17(1):95. doi: 10.1186/s12891-016-0942-x.

A numerical study to determine the effect of ligament stiffness on kinematics of the lumbar spine during flexion.

Putzer M1,2, Auer S3,4, Malpica W5, Suess F6,7, Dendorfer S8,9.

Abstract

BACKGROUND:

There is a wide range of mechanical properties of spinal ligaments documented in literature. Due to the fact that ligaments contribute in stabilizing the spine by limiting excessive intersegmental motion, those properties are of particular interest for the implementation in musculoskeletal models. The aim of this study was to investigate the effect of varying ligament stiffness on the kinematic behaviour of the lumbar spine.

METHODS:

A musculoskeletal model with a detailed lumbar spine was modified according to fluoroscopic recordings and corresponding data files of three different subjects. For flexion, inverse dynamics analysis with a variation of the ligament stiffness matrix were conducted. The influence of several degrees of ligament stiffness on the lumbar spine model were investigated by tracking ligament forces, disc forces and resulting moments generated by the ligaments. Additionally, the kinematics of the motion segments were evaluated.

RESULTS:

An increase of ligament stiffness resulted in an increase of ligament and disc forces, whereas the relative change of disc force increased at a higher rate at the L4/L5 level (19 %) than at the L3/L4 (10 %) level in a fully flexed posture. The same behaviour applied to measured moments with 67 % and 45 %. As a consequence, the motion deflected to the lower levels of the lumbar spine and the lower discs had to resist an increase in loading.

CONCLUSIONS:

Higher values of ligament stiffness over all lumbar levels could lead to a shift of the loading and the motion between segments to the lower lumbar levels. This could lead to an increased risk for the lower lumbar parts.

PMID: 26905410

2. LBP

Patients and PT's views

Spine (Phila Pa 1976). 2016 Feb;41(4):E218-24. doi: 10.1097/BRS.0000000000001193.

Patients' and Physiotherapists' Views on Triggers for Low Back Pain.

Stevens ML[1], Steffens D, Ferreira ML, Latimer J, Li Q, Blyth F, Maher CG.

Abstract

STUDY DESIGN:
A cross-sectional survey.

OBJECTIVE:
The aim of this study was to compare patients' and physiotherapists' views on triggers for low back pain (LBP) and to identify any novel factors not previously reported.

SUMMARY OF BACKGROUND DATA:
Most research on risk factors for LBP is guided by the views of clinicians and researchers, not patients. Consequently, potentially valuable information about risk factors for LBP is not available from those suffering the condition. This study aimed to compare patients' and physiotherapists' views on triggers for LBP and to identify any novel factors not previously reported.

METHODS:
One hundred two physiotherapists and 999 patients with a sudden, acute episode of LBP participated in this study. Participating physiotherapists were asked to nominate the most likely short-term risk factors to trigger a LBP episode. Similarly, patients were asked what they thought had triggered their onset of LBP. Responses were coded into risk factor categories and subcategories by 2 independent researchers. Endorsement of each category was compared using the Pearson Chi-square statistic.

RESULTS:
Both patients and physiotherapists endorsed biomechanical risk factors as the most important risk factor category (87.7% and 89.4%, respectively) and had similar levels of endorsement for 3 of the top 5 subcategories (lifting, bending, and prolonged sitting). There were significant differences in endorsement of awkward postures (13.4% vs 1.2%; P<0.001) sports injuries (15.9% vs 4.7%; P<0.001), physical trauma (3.4% vs 9.2%; P<0.001), and unaccustomed activity (2.3% vs 7.3%; P<0.001) by patients and physiotherapists, respectively.

CONCLUSION:
Overall, patients' and physiotherapists' views were remarkably similar. Both patients and physiotherapists endorsed lifting as the most important trigger for LBP and agreed on 3 of the top 5 (lifting, bending, and prolonged sitting). No new risk factors were suggested by patients.

LEVEL OF EVIDENCE:
2.

PMID: 26571163

Neuropathic pain

Neuropathic low back pain in clinical practice

European Journal of Pain, 03/04/2016Baron R, et al.

Low back pain (LBP) is one of the most common chronic pain conditions. This paper reviews the available literature on the role of neuropathic mechanisms in chronic LBP and discusses implications for its clinical management, with a particular focus on pharmacological treatments. Chronic LBP often has an under–recognized neuropathic component, which can be challenging to manage, and requires improved understanding and better diagnosis and treatment.

Methods

- Literature searches were performed in PubMed, key pain congresses and ProQuest Dialog to identify published evidence on neuropathic back pain and its management.
- All titles were assessed for relevant literature.

Results

- Chronic LBP comprises both nociceptive and neuropathic components, however, the neuropathic component appears under–recognized and undertreated.
- Neuropathic pain (NP) is challenging to manage. Many patients with chronic LBP have pain that is refractory to existing treatments.
- Typically, less than half of patients experience clinically meaningful analgesia with oral pharmacotherapies; these are also associated with risks of adverse effects.
- Paracetamol and NSAIDs, although widely used for LBP, are unlikely to ameliorate the neuropathic component and data on the use of NP medications such as antidepressants and gabapentin/pregabalin are limited.
- While there is an unmet need for improved treatment options, recent data have shown tapentadol to have efficacy in the neuropathic component of LBP, and studies suggest that the capsaicin 8% patch and lidocaine 5% medicated plaster, topical analgesics available for the treatment of peripheral NP, may be a valuable additional approach for the management of neuropathic LBP.

Distress

Arch Phys Med Rehabil. 2016 Feb 24. pii: S0003-9993(16)00133-7. doi: 10.1016/j.apmr.2016.02.004.

Psychological distress in acute low back pain: A review of measurement scales and levels of distress reported in the first two months after pain onset.

Shaw WS[1], Hartvigsen J[2], Woiszwillo MJ[3], Linton SJ[4], Reme SE[5].

Abstract

OBJECTIVE:

To characterize the measurement scales and levels of psychological distress reported among published studies of acute low back pain (LBP) in the scientific literature.

DATA SOURCES:

Peer-reviewed scientific literature found in 8 citation index search engines (Cinahl, Embase, Mantis, PsycINFO, PubMed, Web of Science, AMED, Academic Search Premier) for the period from January 1, 1966 to April 30, 2015, in English, Danish, Norwegian, and Swedish languages.

STUDY SELECTION:

Cross-sectional, case-control, cohort, or randomized trials assessing psychological distress and included participants drawn from patients and workers (or an identifiable subset) with acute LBP (< 8 weeks). Two researchers independently screened titles, abstracts, and full-length articles to identify peer-reviewed studies according to established eligibility criteria.

DATA EXTRACTION:

Descriptive data (study populations, definitions of LBP, distress measures) were systematically extracted and reviewed for risk of bias. Distress measures were described and data pooled in cases of identical measures. Reported levels of distress were contextualized using available population norms, clinical comparison groups, and established clinical cut-off scores.

DATA SYNTHESIS:

Of 10,876 unique records, 23 articles (17 studies) were included. Most common measures were the Beck Depression Inventory (BDI), the Modified Zung Self-Rated Depression (MZSRD) scale, the Centers for Epidemiological Studies - Depression (CESD) scale, and the SF-12 and SF-36 general health status measures. Pooled results for these scales showed consistent elevations in depression, but not anxiety, and reduced mental health status in comparison with the general population.

CONCLUSIONS:

Based on the high consistency across studies using valid measures with a low to moderate risk of bias, there is strong evidence that psychological distress is elevated in acute LBP.

KEYWORDS:

acute low back pain; anxiety; depression; mental health status; psychological distress; systematic review

PMID: 26921683

3. DISC

End plate

Eur Spine J. 2016 Feb 12.

Morphometry of the lower lumbar intervertebral discs and endplates: comparative analyses of new MRI data with previous findings.

Tang R[1,2], Gungor C[3,4], Sesek RF[3], Foreman KB[5], Gallagher S[3], Davis GA[3].

Abstract

PURPOSE:

Variability of the human lower lumbar geometry is related to complications of disc arthroplasty surgery. Accurate morphometric descriptions are essential for the design of artificial intervertebral discs to ensure good prothesis-vertebra contact and better load distribution, and can improve spinal biomechanics. Unfortunately, current knowledge of the lower lumbar geometry is limited either in the representativeness of sample populations or the accuracy and comprehensiveness of measurements. The objective of this study was to establish an accurate and reliable measurement protocol, provide a comprehensive database of lower lumbar geometry, and compare and summarize geometric data as reported in the literature.

METHODS:

T_2-weighted magnetic resonance imaging (MRI) scans of lower lumbar spine (L3-S1), taken from 109 adult subjects, were anonymized from the digital archive of a local hospital. A total of 318 intervertebral discs and 590 endplates met the inclusion criteria and were studied. Linear and planar measurements were performed using OsiriX software, and analyzed using split plot factorial (SPF) analysis of variance (ANOVA), independent student t tests, paired sample t tests, and Tukey's honest significant difference (HSD) post hoc tests.

RESULTS:

Excellent intra- and inter-observer reliabilities were achieved using the proposed measurement protocol. The results of this study indicated that male subjects had significantly larger geometric dimensions. L5/S1 discs had the smallest geometric dimensions compared to the discs at other two levels. Significant craniocaudal differences were found in endplate morpohometry. The error associated with using ellipsoid methods was quantified at each lower lumbar level. A large comprehensive database compiling lower lumbar geometry from many studies was established. This study provides geometric data for the female subjects at the L5/S1 level, previously lacking in the literature.

CONCLUSION:

This study demonstrates the potential of using MRI data to establish a standard measurement protocol for morphometric quantification of the lower lumbar intervertebral discs and vertebral endplates. These results are invaluable in characterizing comprehensive lower lumbar morphometry, which may provide crucial information for planning spinal surgeries, designing artificial intervertebral discs, and for biomechanical modeling of the low lack.

KEYWORDS:

Disc arthroplasty; Endplate; Geometry; Lower lumbar intervertebral disc; Magnetic resonance imaging (MRI)

PMID: 26873104

Modic changes

BMC Musculoskelet Disord. 2016 Feb 19;17(1):92. doi: 10.1186/s12891-016-0934-x.

Modic changes in the lumbar spine and their association with body composition, fat distribution and intervertebral disc height - a 3.0 T-MRI study.

Teichtahl AJ[1,2], Urquhart DM[3], Wang Y[4], Wluka AE[5], O'Sullivan R[6,7], Jones G[8], Cicuttini FM[9].

Abstract

BACKGROUND:

Vertebral endplate (Modic) abnormalities are important structural lesions in the spine, but their association with body composition and fat distribution have not been examined. Moreover, no study has examined whether Modic change are related to other structural features of low back pain, such as reduced intervertebral disc height.

METHODS:

Seventy-two community-based individuals not selected for low back pain had lumbar vertebral Modic change and intervertebral disc height assessed from MRI. Dual energy x-ray absorptiometry measured body composition and fat distribution.

RESULTS:

The predominance of Modic change was type 2. Modic change was associated with an increased fat mass index (OR 1.20, 95 % CI 1.01 to 1.43), and tended to be associated with a reduced fat-free mass index (OR 0.62, 95 % CI 0.37 to 1.03, $p = 0.07$). While an increased percentage of gynoid fat was associated with a reduced risk (OR 0.62, 95 % CI 0.43 to 0.89), an increased percentage of android fat was associated with an increased risk of Modic change (OR 2.11, 95 % CI 1.18 to 3.76). Modic change was also associated with reduced intervertebral disc height at L2/3, L4/5 and L5/S1 (OR range 1.4 to 1.8; all $p \leq 0.03$).

CONCLUSION:

Modic type 2 change is associated with reduced intervertebral disc height and an increased fat mass index. Whereas gynoid fat distribution protected against Modic type 2 change, an android pattern increased the risk of this lesion. Modic type 2 change, which histologically represent fat replacement, might have a metabolic component to its aetiology.

PMID: 26891686

5. SURGERY

Elective vs. non-elective

Eur Spine J. 2016 Feb 5.

Similar result after non-elective and elective surgery for lumbar disc herniation: an observational study based on the SweSpine register.

Elkan P[1,2,3], Sjövie Hasserius J[4], Gerdhem P[5,6].

Abstract

PURPOSE:

Surgery for lumbar disc herniation (LDH) is most often elective, but intense pain may require more urgent, non-elective, treatment. It was hypothesized that non-elective treatment could be associated with a less favourable outcome than elective surgery. The aim of this study was to compare 1-2-year outcome after non-elective and elective surgery for treatment of para-median LDH using data from the Swedish Spine register (SweSpine).

METHODS:

Pre- and postoperative data were available for 301 non-elective and 2364 elective cases. Patient reported outcome measures (PROMs) were; Visual Analogue Scale (VAS) leg and back pain, Oswestry Disability Index (ODI), EuroQol five-Dimensions (EQ-5D) and patient satisfaction. Postoperative p values were adjusted for baseline differences.

RESULTS:

Preoperative mean (SD) in the non-elective and elective groups were for VAS leg pain 81 (22) and 65 (24), for VAS back pain 51 (33) and 45 (28), for ODI 66 (20) and 45 (17) and for EQ-5D 0.024 (0.35) and 0.31 (0.33), respectively, (p for all <0.001). Postoperative VAS leg pain was 23 (28) in the non-elective group and 20 (26) in the elective group (p = 0.19). Corresponding figures were for VAS back pain 25 (27) and 24 (27) (p = 0.69), ODI 19 (17) and 17 (17) (p = 0.052) and for EQ-5D 0.70 (0.28) and 0.73 (0.29) (p = 0.73). Patient satisfaction did not differ between the groups (p = 0.78).

CONCLUSIONS:

Even if non-elective patients preoperatively had substantially more pain, higher disability and poorer quality of life than elective patients, postoperative differences were clinically small. Patient satisfaction did not differ.

KEYWORDS:

Elective; Lumbar disc hernia; Non-elective; Sciatica; Surgical outcome

PMID: 26849140

7. PELVIC ORGANS/WOMAN'S HEALTH

Fat intake and allergies

Pediatr Res. 2016 Jan;79(1-1):114-23. doi: 10.1038/pr.2015.187. Epub 2015 Sep 21.

Fat intake and breast milk fatty acid composition in farming and nonfarming women and allergy development in the offspring.

Jonsson K[1], Barman M[1], Moberg S[1], Sjöberg A[2], Brekke HK[3], Hesselmar B[4], Johansen S[5], Wold AE[6], Sandberg AS[1].

Abstract

BACKGROUND:

Children growing up on small family farms are at much lower risk of developing allergy than other children. We hypothesized that low intake of margarine and polyunsaturated fats among farming families could contribute to this protection.

METHODS:

Twenty-eight mother-infant pairs living on small dairy farms and 37 nonfarm rural resident pairs were recruited in the FARMFLORA birth cohort. Food items expected to affect dietary fat composition were recorded by food frequency questionnaires during pregnancy and by 24-h recalls followed by 24-h food diaries during lactation. Allergy was diagnosed by doctors, using strict predefined criteria. Maternal diet and breast milk fat composition were compared between farming and nonfarming mothers and related to children's allergy at age 3 y.

RESULTS:

Farming mothers consumed more butter, whole milk, saturated fat, and total fat than nonfarming mothers, who consumed more margarine, oils, and low-fat milk. Farming mothers' breast milk contained higher proportions of saturated and lower proportions of polyunsaturated fat. Allergy was eight times more common in nonfarm children. Mothers of allergic children consumed more margarine and oils than mothers of nonallergic children.

CONCLUSION:

Low maternal consumption of margarine and vegetable oils might contribute to the allergy-preventive effect of growing up on small dairy farms.

PMID: 26389822

Food allergies

Pediatr Allergy Immunol. 2016 Mar;27(2):156-61. doi: 10.1111/pai.12515. Epub 2016 Jan 21.

Formula with long-chain polyunsaturated fatty acids reduces incidence of allergy in early childhood.

Foiles AM[1], Kerling EH[1], Wick JA[1], Scalabrin DM[2], Colombo J[3], Carlson SE[1].

Abstract

BACKGROUND:

Allergy has sharply increased in affluent Western countries in the last 30 years. N-3 long-chain polyunsaturated fatty acids (n-3 LCPUFAs) may protect the immune system against development of allergy.

METHODS:

We prospectively categorized illnesses by body system in a subset of 91 children from the Kansas City cohort of the DIAMOND (DHA Intake and Measurement of Neural Development) study who had yearly medical records through 4 years of age. As infants, they were fed either a control formula without LCPUFA (n = 19) or one of three formulas with LCPUFA from docosahexaenoic acid (DHA) and arachidonic acid (ARA) (n = 72).

RESULTS:

Allergic illnesses in the first year were lower in the combined LCPUFA group compared to the control. LCPUFAs significantly delayed time to first allergic illness (p = 0.04) and skin allergic illness (p = 0.03) and resulted in a trend to reduced wheeze/asthma (p = 0.1). If the mother had no allergies, LCPUFAs reduced the risk of any allergic diseases (HR = 0.24, 95% CI = 0.1, 0.56, p = 0.0.001) and skin allergic diseases (HR = 0.35, 95% CI = 0.13, 0.93, p = 0.04). In contrast, if the mother had allergies, LCPUFAs reduced wheezing/asthma (HR = 0.26, 95% CI = 0.07, 0.9, p = 0.02).

CONCLUSIONS:

LCPUFA supplementation during infancy reduced the risk of skin and respiratory allergic diseases in childhood with effects influenced by maternal allergies.

KEYWORDS:

allergy; arachidonic acid; childhood; docosahexaenoic acid; infant formula; long-chain polyunsaturated fatty acids; respiratory; skin

PMID: 26613373

C-section and food allergies

Pediatr Allergy Immunol. 2016 Feb 17. doi: 10.1111/pai.12552.

Cesarean section delivery and development of food allergy and atopic dermatitis in early childhood.

Papathoma E[1], Triga M[1], Fouzas S[1], Dimitriou G[1].

Abstract

BACKGROUND:

Delivery by cesarean section (CS) may predispose to allergic disorders, presumably due to alterations in the establishment of normal gut microbiota in early infancy. In this study, we sought to investigate the association between CS and physician-diagnosed food allergy and atopic dermatitis during the first three years of life, using data from a homogeneous, population-based, birth cohort.

METHODS:

A total of 459 children born and cared for in the same tertiary maternity unit were examined at birth and followed up at 1, 6, 12, 18, 24, 30 and 36 months of age. Participants with symptoms suggestive of food allergy or atopic dermatitis were evaluated by a pediatric allergy specialist to confirm the diagnosis based on well-defined criteria.

RESULTS:

The rate of CS was 50.8% (N=233). Food allergy was diagnosed in 24 participants (5.2%) while atopic dermatitis was diagnosed in 62 children (13.5%). Cesarean section (OR 3.15; 95%CI 1.14-8.70), atopic dermatitis of the child (OR 3.01; 95%CI 1.18-7.80), parental atopy (OR 4.33; 95%CI 1.73-12.1) and gestational age (OR 1.57; 95%CI 1.07-2.37) were significant and independent predictors of food allergy. Children with at least one allergic parent delivered by CS, had higher probability of developing food allergy compared to vaginally-delivered children of non-allergic parents (OR 10.0; 95%CI 3.06-32.7). Conversely, the effect of CS on atopic dermatitis was not significant (OR 1.35; 95%CI 0.74-2.47).

CONCLUSIONS:

Delivery by CS predisposes to development of food allergy but not atopic dermatitis in early childhood. Cesarean section delivery seems to up-regulate the immune response to food allergens, especially in children with allergic predisposition. This article is protected by copyright. All rights reserved.

KEYWORDS:atopic dermatitis; cesarean section; food allergyPMID: 26888069

Diastasis rectus

J Orthop Sports Phys Ther. 2016 Mar;46(3):177-83. doi: 10.2519/jospt.2016.6102. Epub 2016 Jan 26.

Immediate Effect of Active Abdominal Contraction on Inter-recti Distance.

Chiarello CM, McAuley JA, Hartigan EH.

Abstract
Study Design Controlled laboratory study. Background Inter-recti distance (IRD) is the measurement of the linear distance between the medial aspects of the rectus abdominis muscle. Inter-recti distance has been reported to decrease in postpartum women during a curl-up maneuver.

Objective To determine if IRD decreases with active abdominal contraction in men and in nulliparous and parous women. Methods Fifty-six subjects (male, 11; nulliparous female, 22; parous female, 23) participated. Inter-recti distance was measured with the abdominal muscles at rest and during active contraction (curl-up), at 2 locations (above and below the umbilicus), using ultrasound imaging. A mixed-model, repeated-measures analysis of covariance was used for each of the 2 locations, to determine whether IRD differed between contraction states among the 3 groups, with age and umbilicus circumference as covariates. When significant differences were found, planned t test comparisons were made.

Results The parous group's IRD significantly decreased from rest to contraction at both locations, whereas the nulliparous and male groups' IRD did not significantly change from rest to contraction. The nulliparous group's IRD was significantly narrower than the other groups at rest at both locations, and narrower than the parous group during active contraction.

Conclusion Parous women had a narrower IRD in the curl-up condition than at rest, as hypothesized. However, an unexpected finding of a lack of significant within-group change in IRD in nulliparous women and men occurred. Findings suggest that the IRD in men may only differ from that of nulliparous women. J Orthop Sports Phys Ther 2016;46(3):177-183. Epub 26 Jan 2016. doi:10.2519/jospt.2016.6102.

KEYWORDS:

abdominal muscle; diastasis recti; linea alba; rectus abdominis; ultrasound imaging

PMID: 26813756

8. VISCERA

IBS and Celiacs disease

Neurogastroenterol Motil. 2016 Feb 23. doi: 10.1111/nmo.12799.

Prevalence of celiac disease and related antibodies in patients diagnosed with irritable bowel syndrome according to the Rome III criteria. A case-control study.

Sánchez-Vargas LA[1,2], Thomas-Dupont P[1,2], Torres-Aguilera M[1], Azamar-Jacome AA[1], Ramírez-Ceervanes KL[1], Aedo-Garcés MR[1], Meixueiro-Daza A[1],Roesch-Dietlen F[1,3], Grube-Pagola P[1], Vivanco-Cid H[1], Remes-Troche JM[1,3].

Abstract

BACKGROUND:

The cost-effectiveness for screening for celiac disease (CD) in patients with irritable bowel syndrome (IBS), specifically in the diarrhea (IBS-D) subtype, is beneficial if the prevalence is >1%. However, recent studies have shown controversial results. In this large case-control study, our aim was to determine the prevalence of CD and a panel of related antibodies in patients diagnosed with IBS.

MATERIALS AND METHODS:

Four hundred IBS patients (Rome III) and 400 asymptomatic healthy controls were prospectively evaluated using antihuman tissue transglutaminase (h-tTG IgA) and deamidated gliadin peptide antibodies (DGP II IgA and DGP II IgG). Duodenal biopsy was performed on the patients that were positive for the h-tTG IgA and/or DGP II IgG antibodies.

RESULTS:

The mean age of the population was 44.47 ± 18.01 years and 335 (82%) of the subjects were women. Twenty-one patients and six controls had at least one positive test for CD (5.25% VS 1.5%, p = 0.003, OR 3.63 [95% CI 1.4-9.11]). Eighteen patients were positive for h-tTG and/or DGP-II IgG. Histologic confirmation of CD was 2.5% in the IBS patients vs 0.5% in the controls (p = 0.04, OR 5.21). The IBS-D subtype had the highest prevalence for serological positivity (12.7%).

CONCLUSIONS:

Up to 5.2% of the patients with IBS according to the Rome III criteria were positive for at least one of the CD-related antibodies and 2.5% had biopsy-confirmed CD. Therefore, in our population, screening for CD in subjects with IBS appears to be a reasonable strategy, especially in the IBS-D subgroup.

KEYWORDS:

Mexico; celiac disease; diarrhea; gluten; irritable bowel syndrome

PMID: 26914655

Esophagus

Eur J Pain. 2016 Feb 26. doi: 10.1002/ejp.845.

Does catastrophic thinking enhance oesophageal pain sensitivity? An experimental investigation.

Martel MO[1], Olesen AE[2,3], Jørgensen D[2,4], Nielsen LM[2,3], Brock C[2,3], Edwards RR[1], Drewes AM[2,5].

Abstract

BACKGROUND:

Gastro-oesophageal reflux disease (GORD) is a major health problem that is frequently accompanied by debilitating oesophageal pain symptoms.

OBJECTIVES:

The first objective of the study was to examine the association between catastrophizing and oesophageal pain sensitivity. The second objective was to examine whether catastrophizing was associated with the magnitude of acid-induced oesophageal sensitization.

METHODS:

Twenty-five healthy volunteers (median age: 24.0 years; range: 22-31) were recruited and were asked to complete the Pain Catastrophizing Scale (PCS). During two subsequent study visits, mechanical, thermal, and electrical pain sensitivity in the oesophagus was assessed before and after inducing oesophageal sensitization using a 30-min intraluminal oesophageal acid perfusion procedure.

RESULTS:

Analyses were conducted based on data averaged across the two study visits. At baseline, catastrophizing was significantly associated with mechanical ($r = -0.42$, $p < 0.05$) and electrical ($r = -0.60$, $p < 0.01$) pain thresholds. After acid perfusion, catastrophizing was also significantly associated with mechanical ($r = -0.58$, $p < 0.01$) and electrical ($r = -0.50$, $p < 0.05$) pain thresholds. Catastrophizing was not significantly associated with thermal pain thresholds. Subsequent analyses revealed that catastrophizing was not significantly associated with the magnitude of acid-induced oesophageal sensitization.

CONCLUSION:

Taken together, findings from the present study suggest that catastrophic thinking exerts an influence on oesophageal pain sensitivity, but not necessarily on the magnitude of acid-induced oesophageal sensitization. WHAT DOES THIS STUDY ADD?: Catastrophizing is associated with heightened pain sensitivity in the oesophagus. This was substantiated by assessing responses to noxious stimulation of the oesophagus using an experimental paradigm mimicking features and symptoms experienced by patients with gastro-oesophageal reflux disease (GORD).

PMID: 26919233

12 A. WHIPLASH

Catastrophizing and fear avoidance

Eur J Pain. 2016 Feb 26. doi: 10.1002/ejp.848.

Pain-catastrophizing and fear-avoidance beliefs as mediators between post-traumatic stress symptoms and pain following whiplash injury - A prospective cohort study.

Andersen TE[1], Karstoft KI[1], Brink O[1], Elklit A[1].

Abstract

BACKGROUND:

Knowledge about the course of recovery after whiplash injury is important. Most valuable is identification of prognostic factors that may be reversed by intervention. The mutual maintenance model outlines how post-traumatic stress symptoms (PTSS) and pain may be mutually maintained by attention bias, fear, negative affect and avoidance behaviours. In a similar vein, the fear-avoidance model describes how pain-catastrophizing (PCS), fear-avoidance beliefs (FA) and depression may result in persistent pain. These mechanisms still need to be investigated longitudinally in a whiplash cohort.

METHODS:

A longitudinal cohort design was used to assess patients for pain intensity and psychological distress after whiplash injury. Consecutive patients were all contacted within 3 weeks after their whiplash injury (n = 198). Follow-up questionnaires were sent 3 and 6 months post-injury. Latent Growth Mixture Modelling was used to identify distinct trajectories of recovery from pain.

RESULTS:

Five distinct trajectories were identified. Six months post-injury, 64.6% could be classified as recovered and 35.4% as non-recovered. The non-recovered (the medium stable, high stable and very high stable trajectories) displayed significantly higher levels of PTSS, PCS, FA and depression at all time points compared to the recovered trajectories. Importantly, PCS and FA mediated the effect of PTSS on pain intensity.

CONCLUSIONS:

The present study adds important knowledge about the development of psychological distress and pain after whiplash injury. The finding, that PCS and FA mediated the effect of PTSS on pain intensity is a novel finding with important implications for prevention and management of whiplash-associated disorders. WHAT DOES THIS STUDY ADD?: The study confirms the mechanisms as outlined in the fear-avoidance model and the mutual maintenance model. The study adds important knowledge of pain-catastrophizing and fear-avoidance beliefs as mediating mechanisms in the effect of post-traumatic stress on pain intensity. Hence, cognitive behavioural techniques targeting avoidance behaviour and catastrophizing may be beneficial preventing the development of chronic pain.

PMID: 26919333

Pain Catastrophizing and fear avoidance

Eur J Pain. 2016 Feb 26. doi: 10.1002/ejp.848.

Pain-catastrophizing and fear-avoidance beliefs as mediators between post-traumatic stress symptoms and pain following whiplash injury - A prospective cohort study.

Andersen TE[1], Karstoft KI[1], Brink O[1], Elklit A[1].

Abstract

BACKGROUND:

Knowledge about the course of recovery after whiplash injury is important. Most valuable is identification of prognostic factors that may be reversed by intervention. The mutual maintenance model outlines how post-traumatic stress symptoms (PTSS) and pain may be mutually maintained by attention bias, fear, negative affect and avoidance behaviours. In a similar vein, the fear-avoidance model describes how pain-catastrophizing (PCS), fear-avoidance beliefs (FA) and depression may result in persistent pain. These mechanisms still need to be investigated longitudinally in a whiplash cohort.

METHODS:

A longitudinal cohort design was used to assess patients for pain intensity and psychological distress after whiplash injury. Consecutive patients were all contacted within 3 weeks after their whiplash injury (n = 198). Follow-up questionnaires were sent 3 and 6 months post-injury. Latent Growth Mixture Modelling was used to identify distinct trajectories of recovery from pain.

RESULTS:

Five distinct trajectories were identified. Six months post-injury, 64.6% could be classified as recovered and 35.4% as non-recovered. The non-recovered (the medium stable, high stable and very high stable trajectories) displayed significantly higher levels of PTSS, PCS, FA and depression at all time points compared to the recovered trajectories. Importantly, PCS and FA mediated the effect of PTSS on pain intensity.

CONCLUSIONS:

The present study adds important knowledge about the development of psychological distress and pain after whiplash injury. The finding, that PCS and FA mediated the effect of PTSS on pain intensity is a novel finding with important implications for prevention and management of whiplash-associated disorders. WHAT DOES THIS STUDY ADD?: The study confirms the mechanisms as outlined in the fear-avoidance model and the mutual maintenance model. The study adds important knowledge of pain-catastrophizing and fear-avoidance beliefs as mediating mechanisms in the effect of post-traumatic stress on pain intensity. Hence, cognitive behavioural techniques targeting avoidance behaviour and catastrophizing may be beneficial preventing the development of chronic pain.

PMID: 26919333

13. CRANIUM/TMJ

Third molar impaction

J Dent Res. 2016 Mar;95(3):267-76. doi: 10.1177/0022034515615857. Epub 2015 Nov 11.

Predictors of Third Molar Impaction: A Systematic Review and Meta-analysis.

Carter K[1], Worthington S[2].

Abstract
The objective of this meta-analysis was to evaluate the prevalence of third molar (M3) impaction worldwide in individuals ≥17 y, from either sex, who had undergone oral radiography and presented with no orofacial syndromes or defects.

We performed a literature search using PubMed, ISI Web of Science, and Google Scholar and retrieved English and non-English articles from any period for review. We included studies reporting M3 impaction prevalence based on radiographic examination. Risk of bias was assessed regarding individuals with craniofacial syndromes, prior extraction of permanent teeth, multiple effect size estimates, and studies conflating lack of eruption with impaction. Our search yielded 49 studies involving 83,484 individuals. Worldwide M3 impaction prevalence was found to be 24.40% (95% confidence interval [95% CI]: 18.97% to 30.80%). The odds of M3 impaction in the mandible were 57.58% (95% CI: 43.3% to 68.3%, $P < 0.0001$) higher than in the maxilla, but we did not detect any difference in the odds of impaction between men and women (18.62%, 95% CI: -4.9% to 48.0%, $P = 0.12$). Mesioangular impaction was most common (41.17%, 95% CI: 33.8% to 49.0%), followed by vertical (25.55%, 95% CI: 20.0% to 32.0%), distoangular (12.17%, 95% CI: 9.1% to 16.0%), and horizontal (11.06%, 95% CI: 8.3% to 14.6%). Impaction of 1 (42.71%, 95% CI: 30.0% to 56.5%) or 2 (29.64%, 95% CI: 19.5% to 42.3%) M3s was much more common than 3 (12.04%, 95% CI: 7.2% to 19.3%) or 4 (8.74%, 95% CI: 5.2% to 14.5%).

There were small differences among impaction prevalence depending on geographic region (F test, $P = 0.049$). Selection bias was evident because individuals had to undergo radiographic examination to be included in the analysis. The subgroup analysis by sex was underpowered. Worldwide M3 impaction prevalence is lower than previously reported. The percentage of individuals with impacted M3s is much smaller than the percentage that undergoes clinical treatment for M3 problems

Teeth clenching and TMD

Oral Dis. 2016 Feb 23. doi: 10.1111/odi.12465.

Altered neural activation pattern during teeth clenching in temporomandibular disorders.

He S[1], Li F[2], Gu T[1], Liu Y[1], Zou S[1], Huang X[2], Lui S[2], Gong Q[2], Chen S[1].

Abstract

OBJECTIVE:

The aim was to explore the neural activations during teeth clenching in TMDs patients pre- and post-treatment.

SUBJECTS AND METHODS:

Thirty TMDs patients and twenty controls underwent clinical evaluations and functional magnetic resonance imaging with a teeth clenching task. Eleven patients received repeat evaluation and imaging after wearing a stabilization splint for three months.

RESULTS During teeth clench, the TMDs patients showed decreased positive activity in the left precentral gyrus, right and left inferior temporal gyrus and left cerebellum and increased negative activations in the right medial prefrontal cortex ($P<0.05$ after AlphaSim correction). The 11 TMDs patients after treatment showed a return to normal neural activity in these areas. No brain areas in TMDs patients showed differences in activation after treatment compared with the controls, except for an increase in activation in the right cerebellum in the 11 TMDs patients ($P<0.05$ after AlphaSim correction).

CONCLUSION Decreased activations in cerebral areas associated with motor and cognitive functions in TMDs patients during teeth clenching were observed. Normalized activations of these areas happened in patients after routine treatment. These findings may facilitate the understanding of TMDs pathogenesis and the therapeutic mechanisms of the stabilization splint.

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KEYWORDS:

default mode network; functional magnetic resonance imaging; stabilization splints; teeth clenching; temporomandibular disorders

PMID: 6913995

Trigeminal nerve

Clin Neurol Neurosurg. 2016 Feb 10;143:111-115. doi: 10.1016/j.clineuro.2016.02.012.

Clinical study of cerebrospinal fluid neuropeptides in patients with primary trigeminal neuralgia.

Qin ZL[1], Yang LQ[2], Li N[3], Yue JN[4], Wu BS[5], Tang YZ[6], Guo YN[7], Lai GH[8], Ni JX[9].

Abstract

OBJECTIVES:

To investigate the expression levels of calcitonin gene-related peptide (CGRP), substance P (SP), vasoactive intestinal peptide (VIP), and β-endorphin in the cerebrospinal fluid (CSF) and peripheral blood of patients with primary trigeminal neuralgia (TN).

PATIENTS AND METHODS:

We included 20 patients with primary TN who underwent percutaneous radiofrequency thermocoagulation and collected four types of samples from all of them: sample A: CSF samples; sample B: peripheral blood samples; sample C: peripheral blood samples collected one day before the operation; sample D: peripheral blood samples withdrawn one day after the operation. Another 20 CSF samples of patients with nervous system disease or gynecological disease were collected as a control (sample E). Samples A and B were obtained at the same time. We also evaluated the expression of CGRP, SP, β-endorphin, and VIP by visual analog scale (VAS) scores one day before and one day after the operation. In addition, heart rate (HR) at baseline and at the time of sample collection, mean arterial pressure (MAP), and all side effects of the procedure were recorded.

RESULTS:

Significance were found concerning about CGRP, SP, β-endorphin, and VIP in TN patients and the controls ($P<0.001$). The expression of CGRP, SP, and VIP in sample A was higher than that in sample E. However, the β-endorphin level in sample A was lower than that in sample E. There was a positive correlation between sample A and B regarding the expression of CGRP, SP, β-endorphin, and VIP ($P<0. 01$). There was no relationship between the time of disease onset and the expression of CGRP, SP, β-endorphin, and VIP in sample A and sample B ($P>0.05$). No difference was detected between the neuropeptides levels in samples B and C ($P>0.05$). Notably, VAS in sample D was significantly lower than that in sample C ($P<0.01$). Finally, there was no difference between the intraoperative HR and MAP values in the studied samples.

CONCLUSION:

In primary TN patients, the blood levels of CGRP, SP, β-endorphin, and VIP were associated with those in CSF samples. There was a significant difference between the levels of the four neuropeptides in CSF and control samples. Our results also indicated that the levels of neuropeptides in blood samples can be tested for those in CSF. The disease onset and duration exerted insignificant effects on the production and release of CGRP, SP, β-endorphin, and VIP.

KEYWORDS:

Calcitonin gene-related peptide (CGRP); Cerebrospinal fluid (CSF); Endorphin; Neuropeptide; Substance P (SP); Trigeminal neuralgia; Vasoactive intestinal peptide (VIP); β-

PMID: 26918582

14. HEADACHES

PT tests for HA

International consensus on the most useful physical examination tests used by physiotherapists for patients with headache: A Delphi study

Manual Therapy , 03/03/2016

Luedtke K, et al.

To to identify which physical examination tests international experts in physiotherapy consider the most clinically useful for the assessment of patients with headache. Eleven tests are suggested as a minimum standard for the physical examination of musculoskeletal dysfunctions in patients with headache.

Methods

- Delphi survey with pre-specified procedures based on a systematic search of the literature for physical examination tests proposed for the assessment of musculoskeletal dysfunctions in patients with headache.

Results

- Seventeen experts completed all three rounds of the survey.
- Fifteen tests were included in round one with eleven additional tests suggested by the experts.
- Finally eleven physical examination tests were considered clinically useful: manual joint palpation, the cranio-cervical flexion test, the cervical flexion-rotation test, active range of cervical movement, head forward position, trigger point palpation, muscle tests of the shoulder girdle, passive physiological intervertebral movements, reproduction and resolution of headache symptoms, screening of the thoracic spine, and combined movement tests

15. VESTIBULAR

Vestibular home program

Audiol Neurotol Extra 2012;2:16–23 (DOI:10.1159/000337947)

A Comparison of Two Home Exercises for Benign Positional Vertigo: Half Somersault versus Epley Maneuver

Foster C.A.[a] · Ponnapan A.[b] · Zaccaro K.[c] · Strong D.[c]
Departments of [a]Otolaryngology and Audiology, [b]Otolaryngology, and [c]Audiology, School of Medicine, University of Colorado Denver, Aurora, Colo., USA

Abstract
Benign paroxysmal positional vertigo (BPPV) frequently recurs after treatment, so a home exercise would be desirable. We designed a self-administered exercise, the half somersault, for home use. In this randomized single-blind study, we compare the efficacy of our exercise to self-administered Epley maneuvers in patients with BPPV. Subjects performed exercises twice while observed, were re-tested with the Dix Hallpike, and then reported on exercise use for 6 months. Outcome measures were the reduction of nystagmus intensity, tolerability of induced dizziness, and long-term efficacy. Both exercises resulted in a significant reduction in nystagmus after two self-applications. The Epley maneuver was significantly more efficacious in reducing nystagmus initially, but caused significantly more dizziness during application than the half somersault.

During the 6-month follow-up, the Epley group had significantly more treatment failures than the half somersault group. We believe that both exercises can be self-applied to control symptoms, but the half somersault is tolerated better and has fewer side effects as a home exercise.

Hypo function in scoliosis

A retrospective study of thirty-six cases of vestibular hypofunction in adolescents with idiopathic scoliosis

Scoliosis, 03/01/2016Lamantia M, et al.

Asignificant vestibular weakness was observed in patients with AIS when compared to a normal population. The direction of the curvature is related to the side of vestibular weakness. None of the thirty–six patients complained of vestibular based symptoms. This suggests a higher cortical neglect syndrome of the vestibulocortical areas in the right parietal cortex. Further studies including functional magnetic resonance imaging and other functional testing of the vestibular cortex is warranted.

16. CONCUSSIONS

Suicide increases

Journal Scan / Research · March 02, 2016

Increased Suicide Risk Following Concussion

CMAJ : Canadian Medical Association Journal

TAKE-HOME MESSAGE

- Patients diagnosed with a concussion were followed to determine the long-term risk of suicide. After a mean follow up of 9.3 years, the suicide rate was 3-fold higher than normal for the population, with a relative risk for suicide of 1.36 for concussions on the weekend vs those that occurred on a weekday. The risk was similar for all demographic groups and was not related to previous psychiatric diagnoses. The risk increased with time to eventually exceed the risk seen in military personnel.
- Adults diagnosed with concussion, especially when concussion occurs on the weekend, have a significant and persistent increased risk of suicide and require long-term follow up.

Head injuries have been associated with subsequent suicide among military personnel, but outcomes after a concussion in the community are uncertain. We assessed the long-term risk of suicide after concussions occurring on weekends or weekdays in the community.

METHODS

We performed a longitudinal cohort analysis of adults with diagnosis of a concussion in Ontario, Canada, from Apr. 1, 1992, to Mar. 31, 2012 (a 20-yr period), excluding severe cases that resulted in hospital admission. The primary outcome was the long-term risk of suicide after a weekend or weekday concussion.

RESULTS

We identified 235 110 patients with a concussion. Their mean age was 41 years, 52% were men, and most (86%) lived in an urban location. A total of 667 subsequent suicides occurred over a median follow-up of 9.3 years, equivalent to 31 deaths per 100 000 patients annually or 3 times the population norm. Weekend concussions were associated with a one-third further increased risk of suicide compared with weekday concussions (relative risk 1.36, 95% confidence interval 1.14-1.64). The increased risk applied regardless of patients' demographic characteristics, was independent of past psychiatric conditions, became accentuated with time and exceeded the risk among military personnel. Half of these patients had visited a physician in the last week of life.

INTERPRETATION

Adults with a diagnosis of concussion had an increased long-term risk of suicide, particularly after concussions on weekends. Greater attention to the lon

19. GLENOHUMERAL/SHOULDER

Acromial humeral distance

Relationship between extrinsic factors and the acromio-humeral distance

Manual Therapy , 03/03/2016Mackenzie TA, et al.

The aim of this study is to establish if relationship exists between the independent variables of scapular rotation, shoulder internal rotation, shoulder external rotation, total arc of shoulder rotation, pectoralis minor length, thoracic curve, and shoulder activity level with the dependant variables: AHD in neutral, AHD in 60° arm abduction, and percentage reduction in AHD. Pectorals minor length, shoulder rotation ranges, total arc of shoulder rotation, and shoulder activity levels were found to have weak to moderate relationships with acromio–humeral distance.

Existence and strength of relationship was population specific and dependent on arm position. Relationships only accounted for small variances in AHD indicating that in addition to these factors there are other factors involved in determining AHD

22 A. IMPINGMENT

Lesser trochanter

Knee Surg Sports Traumatol Arthrosc. 2016 Feb 11.

Ischiofemoral impingement: defining the lesser trochanter-ischial space.

Kivlan BR[1,2], Martin RL[3,4], Martin HD[5].

Abstract

PURPOSE:

The purpose of this study was to define changes in the ischial-lesser trochanteric space associated with medial and lateral hip rotation in neutral and 10° of extension and adduction.

METHODS:

Twenty-five hip joints from 14 embalmed cadavers (7 males and 7 females) were used for this study. The pelvic region of each cadaver was skeletonized, and the hip capsule released distally. With the hip joint in 0° flexion-extension/abduction-adduction, the distance between the lesser trochanter and ischium was measured in: neutral rotation, 40° medial rotation, and 60° lateral rotation. A one-way ANOVA with post hoc analysis determined the difference in the ischiofemoral space in these three positions. An additional position was then tested by laterally rotating the femur with the hip joint positioned in 10° extension and adduction.

RESULTS:

The average distance between the lesser trochanter and ischium was different ($p < .0005$) in neutral rotation, 40° medial rotation, and 60° lateral rotation at 2.8 cm (SD 1.1), 4.3 cm (SD 1.2), and 1.4 cm (SD 0.7), respectively. With the hip joint laterally rotated from a starting position of 10° extension and adduction, 21 of 25 (84 %) hips made contact between the lesser trochanter and ischium at an average position of 29° (SD 20) of lateral rotation.

CONCLUSIONS:

The lesser trochanter is closest to the ischium in lateral rotation and is furthest away in medial rotation when the hip is in neutral flexion-extension/abduction-adduction. The lesser trochanter approximates the ischium when the hip is laterally rotated in 10° extension and adduction. The information gained through this investigation helps to define the pathomechanics associated with ischiofemoral impingement and validate clinical tests to diagnose ischiofemoral impingement.

KEYWORDS:

Impingement; Ischiofemoral space; Lesser trochanter

PMID: 26869034

31. KNEE

Anterior lateral lig

J Orthop Traumatol. 2016 Feb 9.

The anterolateral ligament of the knee: unwrapping the enigma. Anatomical study and comparison to previous reports.

Kosy JD1, Soni A2, Venkatesh R2, Mandalia VI3.

Abstract

BACKGROUND:

It has been suggested that the anterolateral ligament (ALL) of the knee may have importance in limiting rotational instability, and reconstruction may prevent a continued pivot-shift following anterior cruciate ligament surgery. However, the anatomy of this ligament has not been consistently reported in recent publications. We describe our experience of cadaveric dissection with reference to other published work.

MATERIALS AND METHODS:

Eleven fresh-frozen cadaveric knees were dissected using a standard technique. The ALL tissue was identified with internal rotation of the tibia and varus stress. Measurements were made using a digital caliper and details of the origin and insertion were recorded.

RESULTS:

The ALL was identified in ten of the 11 cadavers. The only specimen in which it was not identified was found to also have an anterior cruciate ligament deficiency. The mean dimensions were: length 40.1 (± 5.53) mm, width 4.63 (± 1.39) mm, thickness 0.87 (± 0.18) mm. The femoral origin was posterior and proximal to the lateral collateral ligament attachment in six knees, anterior and distal in three knees, and at the same site in one knee. The tibial insertion was a mean 17.7 (± 2.95) mm from Gerdy's tubercle (GT) and 12.3 (± 3.55) mm from the fibula head (FH). This was 59.5 (± 5.44) % from GT to FH.

CONCLUSIONS:

This anatomical data adds to previous information about the ALL. Our results support the finding that the ALL is a capsular thickening with meniscal attachment. The findings will help to guide the further work required to define the indications for reconstruction and appropriate grafts.

KEYWORDS:

Anterior cruciate ligament reconstruction; Anterolateral ligament; Knee anatomy; Knee stability

PMID: 26861760

32 A. KNEE/ACL

Gait changes

Movement patterns of the knee during gait following acl reconstruction: a systematic review and meta-analysis

Sports Medicine, 03/03/2016Kaur M, et al.

Joint kinematics are restored, on average, 6 years following reconstruction, while knee external flexion moments remain lower than controls. Knee adduction moments are lower during early phases following reconstruction, but are higher than controls, on average, 5 years post–surgery. Findings indicate that knee function is not fully restored following reconstruction, and long–term maintenance programs may be needed.

Vertical drop

The Relationship Between Landing Sound, Vertical Ground Reaction Force, and Kinematics of the Lower Limb During Drop Landings in Healthy Men

Authors: Kevin Wernli, BSc (Hons)[1,2], Leo Ng, PT, MMT, PhD[1], Xuan Phan, BSc (Hons)[1,3], Paul Davey, BSc[1],Tiffany Grisbrook, BSc (Hons), PhD[1]

Study Design
Controlled laboratory study, cross-sectional.

Background
Soft-landing instruction, which is advocated in several injury prevention programs, is thought to have a qualitative relationship with decreased vertical ground reaction forces (vGRFs) and increased lower-limb joint excursions.

Objective
To quantify the relationships among landing sound, vGRFs, and lower-limb kinematics during a drop-landing task.

Methods
Twenty-six asymptomatic men aged 18 to 35 years were asked to perform 15 single-leg drop landings from a 30-cm height. Five trials were collected under 3 sound conditions: normal, quiet, and loud. The vGRF, lower-limb kinematics (sagittal plane), and impact sound were recorded during the deceleration phase.

Results
A simple linear regression revealed a significant relationship between landing sound and vGRF (R^2 = 0.42,P<.001). A repeated-measures analysis of variance showed that ankle and knee excursion significantly increased by 7.0° and 11.7°, respectively, during quiet landing (compared to normal landing; P<.001). During the loud landing condition, ankle joint excursion significantly decreased by 9.4° compared to the normal landing condition (P<.001), and hip joint excursion significantly increased by 4.0° compared to normal landing condition (P<.045).

Conclusion
As landing sound decreases, so does vGRF during a drop-landing task. These reductions were achieved by increasing ankle and knee joint excursions. Conversely, as the landing sound increases, so does vGRF. This was the result of decreasing ankle joint excursion and increasing hip joint excursion. *J Orthop Sports Phys Ther 2016;46(3):194–199. Epub 26 Jan 2016. doi:10.2519/jospt.2016.6041*

Keyword: impact force, injury prevention, joint excursion

33. MENISCUS

Human serum

Arthroscopy. 2016 Feb 10. pii: S0749-8063(15)00924-X. doi: 10.1016/j.arthro.2015.11.033.

Effect of Human Serum and 2 Different Types of Platelet Concentrates on Human Meniscus Cell Migration, Proliferation, and Matrix Formation.

Freymann U[1], Metzlaff S[2], Krüger JP[3], Hirsh G[4], Endres M[5], Petersen W[2], Kaps C[3].

Abstract

PURPOSE:

To evaluate the effect of 10% human serum (HS), 5% platelet-rich plasma (PRP), and 5% autologous conditioned plasma (ACP) on migration, proliferation, and extracellular matrix (ECM) synthesis of human meniscus cells.

METHODS:

Cell migration and proliferation on stimulation with HS, PRP, and ACP were assessed by chemotaxis assays and measurement of genomic DNA content. Meniscus cells were cultivated in pellets stimulated with 10% HS, 5% PRP, or 5% ACP. Meniscal ECM formation was evaluated by histochemical staining of collagen type I, type II, and proteoglycans and by analysis of fibrochondrocyte marker gene expression.

RESULTS:

Human meniscus cells were significantly attracted by all 3 blood-derived products (10% HS and 5% ACP: P = .0001, 5% PRP: P = .0002). Cell proliferation at day 9 was significantly increased on stimulation with 10% HS (P = .0001) and 5% PRP (P = .0002) compared with 5% ACP and controls. Meniscus cell pellet cultures showed the formation of a well-structured meniscal ECM with deposition of collagen type I, type II, and proteoglycans on stimulation with 10% HS, whereas 5% PRP or 5% ACP resulted in the formation of an inhomogeneous and more fibrous ECM. Stimulation with 10% HS and 5% ACP showed a significant induction of fibrochondrocyte marker genes such as aggrecan (HS: P = .0002, ACP: P = .0147), cartilage oligomeric matrix protein (HS: P = .0002, ACP: P = .0005), and biglycan (HS: P = .0002, ACP: P = .0003), whereas PRP showed no inducing effect.

CONCLUSIONS:

Among all tested blood-derived products, only stimulation with HS showed the formation of a meniscal ECM as well as positive cell proliferating and migrating effects in vitro. Regarding a potential biological repair of nonvascular meniscus lesions, our results may point toward the use of HS as a beneficial augment in regenerative meniscus repair approaches.

CLINICAL RELEVANCE:

Our findings may suggest that HS might be a beneficial augment for meniscus repair.

PMID: 26874799

35. KNEE/TOTAL

Exercise to failure

Am J Phys Med Rehabil. 2016 Mar;95(3):194-203. doi: 10.1097/PHM.0000000000000361.

Strength Training to Contraction Failure Increases Voluntary Activation of the Quadriceps Muscle Shortly After Total Knee Arthroplasty: A Cross-sectional Study.

Mikkelsen EK[1], Jakobsen TL, Holsgaard-Larsen A, Andersen LL, Bandholm T.

Abstract

OBJECTIVE:

The objective of this study was to investigate voluntary activation of the quadriceps muscle during one set of knee extensions performed until contraction failure in patients shortly after total knee arthroplasty.

DESIGN:

This was a cross-sectional study of 24 patients with total knee arthroplasty. One set of knee extensions was performed until contraction failure, using a predetermined 10 repetition maximum loading. In the operated leg, electromyographic (EMG) activity of the lateral and medial vastus, semitendinosus, and biceps femoris muscles was recorded during the set. Muscle activity (%EMGmax) and median power frequency of the EMG power spectrum were calculated for each repetition decile (10%-100% contraction failure).

RESULTS:

Muscle activity increased significantly over contractions from a mean of 90.0 and 93.6 %EMGmax (lateral vastus and medial vastus, respectively) at 10% contraction failure to 99.3 and 105.5 %EMGmax at 100% contraction failure (P = 0.009 and 0.004). Median power frequency decreased significantly over contractions from a mean of 66.8 and 64.2 Hz (lateral vastus and medial vastus, respectively) at 10% contraction failure to 59.9 and 60.1 Hz at 100% contraction failure (P = 0.0006 and 0.0187).

CONCLUSION:

In patients shortly after total knee arthroplasty, 10 repetition maximum-loaded knee extensions performed in one set until contraction failure increases voluntary activation of the quadriceps muscle during the set.

CLINICAL TRIALS:

Gov-identifier: NCT01713140 to the abstract to increase trial transparency.

PMID: 26339729

38 A. FOOT AND ANKLE

Peroneus tertius tendon

J Foot Ankle Surg. 2016 Feb 6. pii: S1067-2516(16)00019-3. doi: 10.1053/j.jfas.2016.01.018.

Insertional Characteristics of the Peroneus Tertius Tendon: Revisiting the Anatomy of an Underestimated Muscle.

Ercikti N[1], Apaydin N[2], Kocabiyik N[3], Yazar F[4].

Abstract
The present study was performed to describe the morphologic characteristics of the peroneus tertius (PT) tendon, evaluate the variations in its insertion point, investigate the interconnections with the tendons of the extensor digitorum longus, and discuss whether these insertion differences of the muscle tension might have an effect on fracture formation. The length and width of the PT tendon and the width at its midpoint were measured in 44 lower extremities. The data obtained were compared statistically. The PT was found to occur in 2 types according to the number of tendons: type 1, a single tendon without a slip; and type 2, 2 tendons with a slip. It has been suggested that the PT tendon could contribute to avulsion fractures of the tuberosity of the fifth metatarsal bone.

Therefore, to understand the mechanism of Jones fracture, knowledge of the PT tendon would be beneficial to determine the insertion points.

KEYWORDS:

anatomic variation; fracture; metatarsal; muscle

PMID: 26860045

40. ANKLE SPRAINS AND INSTABILITY

Ligament involvement in instability

BMC Musculoskelet Disord. 2016 Feb 24;17(1):96. doi: 10.1186/s12891-016-0954-6.

Posterolateral ankle ligament injuries affect ankle stability: a finite element study.

Zhu ZJ[1], Zhu Y[1], Liu JF[1], Wang YP[1], Chen G[1], Xu XY[2].

Abstract

BACKGROUND:

We have already discovered 23 patients during the work of the outpatient department and operations whose unstable signs on the posterolateral ankle. The anterior drawer test demonstrated normal during the physical examinations while the spaces of the posterior tibiotalar joints increased in stress X-ray plain films. ATFL intact and posterolateral ligaments lax were found during operations too. It is important to make existence claims and illuminate the mechanism of posterolateral ankle instability.

METHODS:

A finite element model of the ankle was established for simulating to cut off posterolateral ligaments in turn. Ankle movements with tibia rotation under load on five forefoot positions were simulated as well.

RESULTS:

The difference values with tibia external rotation were negative, and the positive results occurred with tibia internal rotation. The tibia-talus difference values in some forefoot positions were 2 ~ 3 mm after PTFL together with CFL or/and PITFL were cut off. The tibula-talus difference values were 2.21 ~ 2.76 mm after both PTFL and CFL were cut off. The tibia-fibula difference values were small. The difference values increased by 2 ~ 5 mm after cutting off the PITFL.

CONCLUSIONS:

Posterolateral ankle ligaments, especially CFL and PITFL, play a significant role in maintaining ankle stability. The serious injuries of both CFL and PITFL would affect posterolateral ankle stabilities. PITFL was important to subtalar joint stability.

PMID: 26905722

45 D. MANUAL THERAPY EXTREMITIES

Joint mob of knee

J Orthop Sports Phys Ther. 2016 Mar;46(3):168-76. doi: 10.2519/jospt.2016.6259. Epub 2016 Jan 1.

Joint Mobilization Enhances Mechanisms of Conditioned Pain Modulation in Individuals With Osteoarthritis of the Knee.

Courtney CA, Steffen AD, Fernández-de-Las-Pñas C, Kim J, Chmell SJ.

Abstract
Study Design An experimental laboratory study with a repeated-measures crossover design. Background Treatment effects of joint mobilization may occur in part by decreasing excitability of central nociceptive pathways. Impaired conditioned pain modulation (CPM) has been found experimentally in persons with knee and hip osteoarthritis, indicating impaired inhibition of central nociceptive pathways. We hypothesized increased effectiveness of CPM following application of joint mobilization, determined via measures of deep tissue hyperalgesia. Objective To examine the effect of joint mobilization on impaired CPM.

Methods An examination of 40 individuals with moderate/severe knee osteoarthritis identified 29 (73%) with impaired CPM. The subjects were randomized to receive 6 minutes of knee joint mobilization (intervention) or manual cutaneous input only, 1 week apart. Deep tissue hyperalgesia was examined via pressure pain thresholds bilaterally at the knee medial joint line and the hand at baseline, postintervention, and post-CPM testing. Further, vibration perception threshold was measured at the medial knee epicondyle at baseline and post-CPM testing.

Results Joint mobilization, but not cutaneous input intervention, resulted in a global increase in pressure pain threshold, indicated by diminished hyperalgesic responses to pressure stimulus. Further, CPM was significantly enhanced following joint mobilization. Diminished baseline vibration perception threshold acuity was enhanced following joint mobilization at the knee that received intervention, but not at the contralateral knee. Resting pain was also significantly lower following the joint intervention.

Conclusion Conditioned pain modulation was enhanced following joint mobilization, demonstrated by a global decrease in deep tissue pressure sensitivity. Joint mobilization may act via enhancement of descending pain mechanisms in patients with painful knee osteoarthritis. J Orthop Sports Phys Ther 2016;46(3):168-176. Epub 1 Jan 2016. doi:10.2519/jospt.2016.6259.

KEYWORDS:

arthralgia; diffuse noxious inhibitory control; manual therapy; physical therapy techniques

PMID:26721229

52. EXERCISE

Resistance training

Sports Med. 2016 Feb 25.

Resistance Training as a Tool for Preventing and Treating Musculoskeletal Disorders.

Ciolac EG[1], Rodrigues-da-Silva JM[2].

Abstract
The aging process is characterized by several physiological, morphological, and psychological alterations that result in a decreased functional and health status throughout the life span. Among these alterations, the loss of muscle mass and strength (sarcopenia) is receiving increased attention because of its association with innumerous age-related disorders, including (but not limited to) osteoporosis, osteoarthritis, low back pain, risk of fall, and disability. Regular participation in resistance training programs can minimize the musculoskeletal alterations that occur during aging, and may contribute to the health and well-being of the older population. Compelling evidence suggest that regular practice of resistance exercise may prevent and control the development of several musculoskeletal chronic diseases. Moreover, resistance training may also improve physical fitness, function, and independence in older people with musculoskeletal disorders, which may result in improved quality of the years lived.

In summary, regular participation in resistance training programs plays an important role in aging and may be a preventive and therapeutic tool for several musculoskeletal disorders.

PMID: 26914266

Exercise training

Current Opinion Sports Medicinepp 1-11

Skeletal Muscle Hypertrophy with Concurrent Exercise Training: Contrary Evidence for an Interference Effect

- Kevin A. Murach , James R. Bagley

Abstract

Over the last 30+ years, it has become axiomatic that performing aerobic exercise within the same training program as resistance exercise (termed concurrent exercise training) interferes with the hypertrophic adaptations associated with resistance exercise training. However, a close examination of the literature reveals that the interference effect of concurrent exercise training on muscle growth in humans is not as compelling as previously thought. Moreover, recent studies show that, under certain conditions, concurrent exercise may augment resistance exercise-induced hypertrophy in healthy human skeletal muscle. The purpose of this article is to outline the contrary evidence for an acute and chronic interference effect of concurrent exercise on skeletal muscle growth in humans and provide practical literature-based recommendations for maximizing hypertrophy when training concurrently

59. PAIN

Mindfulness and pain

Pitt study shows mindfulness meditation can lead to back pain relief for older adults

UPMC, 03/03/2016

Mindfulness meditation programs can help reduce severe pain and increase function for older adults with chronic low back pain, according to new research led by the University of Pittsburgh School of Medicine. Published online and scheduled for the March issue of JAMA Internal Medicine, after an eight–week mind–body program, people with chronic low back pain noted an improvement in their physical function and a decrease in their current and most severe pain. The research was supported by the National Institutes of Health (NIH). Mindfulness meditation is a mind–body method described as paying attention on purpose and staying in the present moment to experience each unfolding event. The study assessed the effects of mindfulness on 282 adults age 65 and older who experienced chronic lower back pain daily or almost every day. Participants were taught three mindfulness meditation methods they practiced alone and in group sessions for eight weeks: self–examination in which the participant lays down and focuses attention non–judgmentally on each area of the body; sitting practice, which focuses on breathing while seated; and walking meditation, which is mindful, slow walking with focused attention on how the body feels. Participants were assessed on measures of pain, physical function, self–efficacy and quality of life before the program began, at the end of the program and at a six–month follow–up. The study found that the mind–body program helped with pain management even six months after the program, indicating there is a long–term benefit on coping with pain.

However, while patient function was immediately improved after the eight–week program, at the six–month follow–up, the impact of the program on function was not significant. At six–months, 76 percent of participants still noted improvement in their back pain symptoms and their ability to cope with pain as a result of the mind–body program.

Self reported pain

Pain. 2016 Mar;157(3):546-51. doi: 10.1097/j.pain.0000000000000356.

Test-retest reliability of pain-related functional brain connectivity compared with pain self-report.

Letzen JE[1], Boissoneault J, Sevel LS, Robinson ME.

Abstract
Test-retest reliability, or reproducibility of results over time, is poorly established for functional brain connectivity (fcMRI) during painful stimulation. As reliability informs the validity of research findings, it is imperative to examine, especially given recent emphasis on using functional neuroimaging as a tool for biomarker development. Although proposed pain neural signatures have been derived using complex, multivariate algorithms, even the reliability of less complex fcMRI findings has yet to be reported. This study examined the test-retest reliability for fcMRI of pain-related brain regions, and self-reported pain (through visual analogue scales [VASs]). Thirty-two healthy individuals completed 3 consecutive fMRI runs of a thermal pain task. Functional connectivity analyses were completed on pain-related brain regions. Intraclass correlations were conducted on fcMRI values and VAS scores across the fMRI runs. Intraclass correlations coefficients for fcMRI values varied widely (range = -.174-.766), with fcMRI between right nucleus accumbens and medial prefrontal cortex showing the highest reliability (range = .649-.766). Intraclass correlations coefficients for VAS scores ranged from .906 to .947.

Overall, self-reported pain was more reliable than fcMRI data. These results highlight that fMRI findings might be less reliable than inherently assumed and have implications for future studies proposing pain markers.

PMID: 26371795

Hypermobile syndrome like FM

Eur J Pain. 2016 Feb 26. doi: 10.1002/ejp.856.

Central sensitization as the mechanism underlying pain in joint hypermobility syndrome/Ehlers-Danlos syndrome, hypermobility type.

Di Stefano G[1], Celletti C[2], Baron R[3], Castori M[4], Di Franco M[5], La Cesa S[1], Leone C[1], Pepe A[1], Cruccu G[1], Truini A[1], Camerota F[2].

Abstract

BACKGROUND:

Patients with joint hypermobility syndrome/Ehlers-Danlos syndrome, hypermobility type (JHS/EDS-HT) commonly suffer from pain. How this hereditary connective tissue disorder causes pain remains unclear although previous studies suggested it shares similar mechanisms with neuropathic pain and fibromyalgia.

METHODS:

In this prospective study seeking information on the mechanisms underlying pain in patients with JHS/EDS-HT, we enrolled 27 consecutive patients with this connective tissue disorder. Patients underwent a detailed clinical examination, including the neuropathic pain questionnaire DN4 and the fibromyalgia rapid screening tool. As quantitative sensory testing methods, we included thermal-pain perceptive thresholds and the wind-up ratio and recorded a standard nerve conduction study to assess non-nociceptive fibres and laser-evoked potentials, assessing nociceptive fibres.

RESULTS:

Clinical examination and diagnostic tests disclosed no somatosensory nervous system damage. Conversely, most patients suffered from widespread pain, the fibromyalgia rapid screening tool elicited positive findings, and quantitative sensory testing showed lowered cold and heat pain thresholds and an increased wind-up ratio.

CONCLUSIONS:

While the lack of somatosensory nervous system damage is incompatible with neuropathic pain as the mechanism underlying pain in JHS/EDS-HT, the lowered cold and heat pain thresholds and increased wind-up ratio imply that pain in JHS/EDS-HT might arise through central sensitization. Hence, this connective tissue disorder and fibromyalgia share similar pain mechanisms. WHAT DOES THIS STUDY ADD?: In patients with JHS/EDS-HT, the persistent nociceptive input due to joint abnormalities probably triggers central sensitization in the dorsal horn neurons and causes widespread pain.

PMID: 26919608

62 A. NUTRITION/VITAMINS

B 12 and memory

Am J Clin Nutr. 2016 Feb 24. pii: ajcn116970.

Vitamin B-12 concentration, memory performance, and hippocampal structure in patients with mild cognitive impairment.

Köbe T[1], Witte AV[2], Schnelle A[1], Grittner U[3], Tesky VA[4], Pantel J[4], Schuchardt JP[5], Hahn A[5], Bohlken J[6], Rujescu D[7], Flöel A[8].

Abstract

BACKGROUND:

Low-normal concentrations of vitamin B-12 (VitB12) may be associated with worse cognition. However, previous evidence has been mixed, and the underlying mechanisms remain unclear.

OBJECTIVE:

We determined whether serum VitB12 concentrations within the normal range were linked to memory functions and related neuronal structures in patients with mild cognitive impairment (MCI).

DESIGN:

In a cross-sectional design, we assessed 100 amnestic MCI patients (52 women; age range: 50-80 y) with low- and high-normal VitB12 concentration (median split: 304 pmol/L) for memory functions with the use of the Auditory Verbal Learning Test. MRI was performed at 3 tesla (n = 86) for the estimation of the volume and microstructure of the hippocampus and its subfields as indicated by the mean diffusivity on diffusion-weighted images. With the use of a mediation analysis, we examined whether the relation between VitB12 and memory performance was partially explained by volume or microstructure.

RESULTS:

MCI patients with low-normal VitB12 showed a significantly poorer learning ability (P = 0.014) and recognition performance (P = 0.008) than did patients with high-normal VitB12. Also, the microstructure integrity of the hippocampus was lower in patients with low-normal VitB12, mainly in the cornu ammonis 4 and dentate gyrus region (P = 0.029), which partially mediated the effect of VitB12 on memory performance (32-48%). Adjustments for age, sex, education, apolipoprotein E e4 status, and total homocysteine, folate, and creatinine did not attenuate the effects.

CONCLUSIONS:

Low VitB12 concentrations within the normal range are associated with poorer memory performance, which is an effect that is partially mediated by the reduced microstructural integrity of the hippocampus. Future interventional trials are needed to assess whether supplementation of VitB12 may improve cognition in MCI patients even in the absence of clinically manifested VitB12 deficiency. This trial was registered at clinicaltrials.gov as NCT01219244.

KEYWORDS:

MCI; episodic memory; hippocampus; mean diffusivity; vitamin B-12

PMID: 26912492

Fish consumption

Fish consumption in mid-childhood and its relationship to neuropsychological outcomes measured in 7-9 year old children using a NUTRIMENTHE Neuropsychological battery

Clinical Nutrition, 02/26/2016GispertLlaurado M, et al. –

The authors aim to assess the relation between fish consumption, estimated dietary n–3 long–chain polyunsaturated fatty acids (LCPUFA) intake and cognition and behaviour in childhood in a multi–centre European sample. Children who consumed 2 fish meals per week including one of fatty fish were less likely to show emotional and behavioural problems than those who did not.

Methods

- Children from 2 European studies, CHOP and NUHEAL, were assessed at 8 and 7.5 years of age, respectively.
- Different outcomes of neuropsychological development (assessed with the standardized NUTRIMENTHE Neuropsychological Battery (NNB) consisting of 15 subtests) were related with outcomes from a food-frequency questionnaire (FFQ) focusing on the consumption of fish.

Results

- A total of 584 children completed the FFQ and the neuropsychological tests.
- The authors found no associations with calculated DHA or EPA intakes for any of the neuropsychological domains.
- Children who consumed 2 fish meals per week including one of fatty fish, showed no substantive differences in the cognitive domains from the children who did not.
- However negative associations with fatty fish consumption were found for social problems (p=0.019), attention problems (p=0.012), rule-breaking problems (p=0.019) and aggressive behaviour problems (p=0.032).
- No association was observed with internalizing problems.
- Higher levels of externalizing problems (p=0.018) and total problems (p=0.018) were associated with eating less fatty fish.

Omega 3's and depression

The omega-3 index is inversely associated with depressive symptoms among individuals with elevated oxidative stress biomarkers

The Journal of Nutrition, 03/03/2016

Bigornia SJ, et al.

In this study, the authors examined the association between ω–3 FA biomarkers and depressive symptoms as well as the potential influence of oxidative stress. An inverse association between the omega–3 index and depressive symptoms was observed among participants with elevated oxidative stress biomarkers. These data suggest that oxidative stress status may identify those who might benefit from ω–3 FA consumption to improve depressive symptoms.

Methods

- Baseline and longitudinal analyses were conducted in the Boston Puerto Rican Health Study (n = 787; participants aged 57 ± 0.52 y, 73% women).
- Urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG) concentration, a measure of oxidative stress, and erythrocyte FA composition were collected at baseline.
- The authors calculated the omega-3 index as the sum of eicosapentaenoic and docosahexaenoic acids, expressed as a percentage of total FAs.
- Baseline and 2-y depressive symptoms were characterized by using the Center for Epidemiological Studies–Depression Scale (CES-D).
- Statistical analyses included linear and logistic regression.

Results

- Urinary 8-OHdG concentration tended to modify the relation between the erythrocyte omega-3 index and baseline CES-D score (P-interaction = 0.10).
- In stratified analyses, the omega-3 index was inversely associated with CES-D score (β = -1.74, SE = 0.88; P = 0.02) among those in the top quartile of 8-OHdG concentration but not among those in the lower quartiles.
- The relation between the omega-3 index and CES-D at 2 y was more clearly modified by 8-OHdG concentration (P-interaction = 0.04), where the omega-3 index was inversely associated with CES-D at 2 y, adjusted for baseline (β = -1.66, SE = 0.66; P = 0.02), only among those with elevated 8-OHdG concentrations.
- Among individuals not taking antidepressant medications and in the top tertile of urinary 8-OHdG concentration, the omega-3 index was associated with significantly lower odds of a CES-D score ≥16 at baseline (OR: 0.72; 95% CI: 0.53, 0.96) but not at 2 y (OR: 0.83; 95% CI: 0.60, 1.15).

Bones and vegetarian diets

Swiss Med Wkly. 2016 Feb 22;146:w14277. doi: 10.4414/smw.2016.14277. eCollection 2016.

The role of low acid load in vegetarian diet on bone health: a narrative review.

Burckhardt P[1].

Abstract
Vegetarian and vegan diets contain low amounts of protein and calcium. For this reason they are supposed to cause low bone mineral density (BMD) and osteoporosis. But this is not the case, except for vegans with a particularly low calcium intake. The absence of osteoporosis or low BMD can be explained by the low acid load of these diets. Nutritional acid load is negatively correlated with bone mineral density (BMD) and positively with fracture risk. Low acid load is correlated with lower bone resorption and higher BMD. It is linked to high intake of potassium-rich nutrients, such as fruits and vegetables, as found in vegetarian diets.

The total nutritional acid load, which not only depends on the potassium content of the nutrition, was recently assessed in several studies on vegetarian and vegan diets and was found to be very low or absent, while the diet of Western-style omnivores produces daily 50 to 70 mEq of acid. This might be an important factor for the protection of vegetarians from osteoporosis.

PMID: 26900949

62 B. CRYOTHERAPY

Cryo helps post exercise pain

Sports Med. 2016 Feb 18.

What are the Physiological Mechanisms for Post-Exercise Cold Water Immersion in the Recovery from Prolonged Endurance and Intermittent Exercise?

Ihsan M[1,2], Watson G[3], Abbiss CR[4].

Abstract
Intense training results in numerous physiological perturbations such as muscle damage, hyperthermia, dehydration and glycogen depletion. Insufficient/untimely restoration of these physiological alterations might result in sub-optimal performance during subsequent training sessions, while chronic imbalance between training stress and recovery might lead to overreaching or overtraining syndrome. The use of post-exercise cold water immersion (CWI) is gaining considerable popularity among athletes to minimize fatigue and accelerate post-exercise recovery. CWI, through its primary ability to decrease tissue temperature and blood flow, is purported to facilitate recovery by ameliorating hyperthermia and subsequent alterations to the central nervous system (CNS), reducing cardiovascular strain, removing accumulated muscle metabolic by-products, attenuating exercise-induced muscle damage (EIMD) and improving autonomic nervous system function. The current review aims to provide a comprehensive and detailed examination of the mechanisms underpinning acute and longer term recovery of exercise performance following post-exercise CWI. Understanding the mechanisms will aid practitioners in the application and optimisation of CWI strategies to suit specific recovery needs and consequently improve athletic performance. Much of the literature indicates that the dominant mechanism by which CWI facilitates short term recovery is via ameliorating hyperthermia and consequently CNS mediated fatigue and by reducing cardiovascular strain. In contrast, there is limited evidence to support that CWI might improve acute recovery by facilitating the removal of muscle metabolites. CWI has been shown to augment parasympathetic reactivation following exercise. While CWI-mediated parasympathetic reactivation seems detrimental to high-intensity exercise performance when performed shortly after, it has been shown to be associated with improved longer term physiological recovery and day to day training performances.

The efficacy of CWI for attenuating the secondary effects of EIMD seems dependent on the mode of exercise utilised. For instance, CWI application seems to demonstrate limited recovery benefits when EIMD was induced by single-joint eccentrically biased contractions. In contrast, CWI seems more effective in ameliorating effects of EIMD induced by whole body prolonged endurance/intermittent based exercise modalities.

PMID:26888646

64. ELECTROTHERAPY

Laser in neck pain

Lasers Med Sci. 2016 Feb 25.

Efficacy of high-intensity laser therapy in the treatment of chronic neck pain: a randomized double-blind placebo-control trial.

Alayat MS[1], Mohamed AA[2], Helal OF[2], Khaled OA[3].

Abstract
The aim of the study was to investigate the effect of high-intensity laser therapy (HILT) in treatment of patients with chronic neck pain (CNP) on cervical range of motion (ROM), pain, and functional activity.

Sixty male patients participated in this study with mean (SD) age of 35.47 (4.18) years. Patients were randomly assigned into two groups and treated with HILT plus exercise (HILT + EX) and placebo laser plus exercise (PL + EX) in groups 1 and 2, respectively. The outcomes measured were cervical ROM, pain level by visual analog scale (VAS), and functional activity by neck disability index (NDI) score. Statistical analyses were performed to compare the differences between baseline and post-treatment. The level of statistical significance was set as $p < 0.05$. Cervical ROM significantly increased after 6 weeks of treatment in all groups. VAS and NDI results showed significant decrease post-treatment in both groups. HILT + EX effectively increased cervical ROM and decreased VAS and NDI scores after 6 weeks of treatment compared to PL + EX. HILT + EX is an effective physical therapy modality for patients with CNP compared to PL + EX therapy.

The combination of HILT + EX effectively increased cervical ROM, functional activity, and reduced pain after 6 weeks of treatment.

KEYWORDS:

Chronic neck pain; Disability; Exercise; Functional; High-intensity LASER therapy; Pain

PMID: 26914684