

3. DISC

Changes in youth with LBP

AJNR Am J Neuroradiol. 2017 Aug;38(8):1647-1652. doi: 10.3174/ajnr.A5237. Epub 2017 Jun 1.

Temporal Evolution of Disc in Young Patients with Low Back Pain and Stress Reaction in Lumbar Vertebrae.

Sharma A^{1,2,3}, Sargar K⁴, Salter A⁵.

BACKGROUND AND PURPOSE:

Although stress-induced bony changes often resolve with conservative treatment, the long-term effects of such mechanical stresses on intervertebral discs have not been studied. We aimed to assess the differences in the temporal evolution of disc in segments of the lumbar spine with and without signs of increased mechanical stresses.

MATERIALS AND METHODS:

Using MR imaging performed >6 months apart, 2 radiologists evaluated lumbar intervertebral discs for degenerative changes affecting the annulus fibrosus, the nucleus pulposus, and the endplates in 42 patients (22 male, 20 female; mean age, 16.0 ± 3.7 years [range, 7-25 years]) with low back pain and imaging evidence of stress reaction/fracture in the lumbar spine. Data were analyzed for differences in the presence and progression of disc degeneration in stressed versus nonstressed segments.

RESULTS:

At baseline, stressed discs had a higher burden of annular fissures, radial fissures, herniation, and nuclear degeneration. Endplate defect burden was comparable in stressed and control discs. At follow-up, the burden of new annular fissures and endplate defects was comparable for stressed and control discs. However, a higher proportion of stressed discs showed worsening nuclear signal intensity grade (14.3% versus 0% control discs; $P = .008$) and worsening nuclear degeneration grade (11.9% versus 0% control discs; $P = .02$). An increased risk of progressive nuclear degeneration of stressed discs was observed irrespective of the outcome of bony changes.

CONCLUSIONS:

Stressed discs exhibit a higher burden of nuclear and annular degeneration at baseline. These discs have a higher risk of progressive nuclear degeneration irrespective of improvement or worsening of stress-related bony changes.

5. SURGERY

Comparison

World Neurosurg. 2017 Aug 9. pii: S1878-8750(17)31322-0. doi: 10.1016/j.wneu.2017.08.025.

Open versus Minimally Invasive Surgery for Extraforaminal Lumbar Disk Herniation: A systematic review and meta-analysis.

Akinduro OO¹, Kerezoudis P², Alvi MA², Yoon J¹, Eluchie J³, Murad HM⁴, Wang Z⁵, Chen SG⁶, Bydon M⁷.

INTRODUCTION:

Extraforaminal disk herniation (EDH) accounts for 3-11% of all disk herniations. Despite the heterogeneity of spinal procedures, there is a paucity of literature comparing the outcomes from different surgical approaches.

METHODS:

We performed a systematic review and meta-analysis of available literature on EDHs. We compared patients undergoing open surgery (OS) with those undergoing minimally invasive surgery (MIS) approaches, including tubular microscopic, percutaneous endoscopic, and micro-endoscopic.

RESULTS:

A total of 41 studies with 1810 patients (1239 OS, 574 MIS) were included our analysis. The MIS group showed no significant difference from OS group in the incidence of complications (MIS: 0.01 vs OS: 0.01, $p=0.971$) or reoperation (OS: 0.04, MIS: 0.03; $p=0.382$). There was an increased incidence of poor patient satisfaction according to MacNab criteria for the OS group compared to the MIS group, but the difference was not statistically significant (OS: 0.14 vs MIS: 0.06; $p=0.237$). The OS group had higher estimated blood loss (EBL) (Mean Difference [MD]: 38.6 mL), slightly longer operative time (MD: 12.2 minutes), longer hospital stay (MD: 30.3 hours), and longer return to work time (MD: 3.3 weeks). Tubular microscopic procedures had a lower incidence of reoperation than both percutaneous endoscopic (0.01 vs 0.06, $p=0.01$) and micro-endoscopic procedures (0.01 vs 0.05, $p=0.03$).

CONCLUSION:

Minimally invasive procedures for EDHs are associated with a similar incidence of complications and reoperation but lower EBL, shorter operative time, shorter hospital stay, and faster return to work time compared to OS. Tubular microscopic have the lowest reoperation rate of MIS procedures.

7. PELVIC ORGANS/WOMAN'S HEALTH

Pelvic assessment

ORIGINAL RESEARCH

Biomechanical paradigm and interpretation of female pelvic floor conditions before a treatment

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DOI <https://doi.org/10.2147/IJWH.S136989>

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Background: Further progress in restoring a woman's health may be possible if a patient with a damaged pelvic floor could undergo medical imaging and biomechanical diagnostic tests. The results of such tests could contribute to the analysis of multiple treatment options and suggest the optimal one for that patient.

Aim: To develop a new approach for the biomechanical characterization of vaginal conditions, muscles, and connective tissues in the female pelvic floor.

Methods: Vaginal tactile imaging (VTI) allows biomechanical assessment of the soft tissue along the entire length of the anterior, posterior, and lateral vaginal walls at rest, with manually applied deflection pressures and with muscle contraction, muscle relaxation, and Valsalva maneuver. VTI allows a large body of measurements to evaluate individual variations in tissue elasticity, support defects, as well as pelvic muscle function. Presuming that 1) the female pelvic floor organs are suspended by ligaments against which muscles contract to open or close the outlets and 2) damaged ligaments weaken the support and may reduce the force of muscle contraction, we made an attempt to characterize multiple pelvic floor structures from VTI data.

Results: All of the 138 women enrolled in the study were successfully examined with the VTI. The study subjects have had normal pelvic support or pelvic organ prolapse (stages I–IV). The average age of this group of subjects was 60±15 years. We transposed a set of 31 VTI parameters into a quantitative characterization of pelvic muscles and ligamentous structures. Interpretation of the acquired VTI data for normal pelvic floor support and prolapse conditions is proposed based on biomechanical assessment of the functional anatomy.

Conclusion: Vaginal tactile imaging allows biomechanical characterization of female pelvic floor structures and tissues in vivo, which may help to optimize treatment of the diseased conditions such as prolapse, incontinence, atrophy, and some forms of pelvic pain.

8. VISCERA

Impact of Crohn's disease on children MS health

Musculoskeletal health in newly diagnosed children with Crohn's disease

- L. M. Ward . Ma F. Rauch E. I. Benchimol J. Hay M. B. Leonard M. A. Matzinger
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Summary

We evaluated the impact of Crohn's disease on muscle and bone strength, mass, density, and geometry in children with newly diagnosed CD and found profound muscle and bone deficits; nevertheless, the prevalence of vertebral fractures at this time point was low.

Introduction

Crohn's disease (CD) is an inflammatory condition of the gastrointestinal tract that can affect the musculoskeletal system. The objective of this study was to determine the prevalence of vertebral fractures and the impact of CD on muscle and bone mass, strength, density, and geometry in children with newly diagnosed CD.

Methods

Seventy-three children (26 girls) aged 7.0 to 17.7 years were examined within 35 days following CD diagnosis by lateral spine radiograph for vertebral fractures and by jumping mechanography for muscle strength. Bone and muscle mass, density, and geometry were assessed by dual-energy x-ray absorptiometry and peripheral quantitative computed tomography (pQCT).

Results

Disease activity was moderate to severe in 66 (90%) patients. Mean height (Z-score -0.3 , standard deviation (SD) 1.1 , $p = 0.02$), weight (Z-score -0.8 , SD 1.3 , $p < 0.01$), body mass index (Z-score -1.0 , SD 1.3 , $p < 0.01$), lumbar spine areal bone mineral density (BMD; Z-score -1.1 , SD 1.0 , $p < 0.01$), total body bone mineral content (Z-score -1.5 , SD 1.0 , $p < 0.01$), and total body lean mass (Z-score -2.5 , SD 1.1 , $p < 0.01$) were all low for age and gender. pQCT showed reduced trabecular volumetric BMD at the tibial metaphysis, expansion of the bone marrow cavity and thin cortices at the diaphysis, and low calf muscle cross-sectional area. Jumping mechanography demonstrated low muscle power. Only one patient had a vertebral fracture.

Conclusions

Children with newly diagnosed CD have profound muscle and bone deficits; nevertheless, the prevalence of vertebral fractures at this time point was low.

13. CRANIUM/TMJ

Fascial asymmetries

Dentoskeletal parameters related to visual perception of facial asymmetry in patients with skeletal class III malocclusion after orthognathic surgery

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DOI: <http://dx.doi.org/10.1016/j.ijom.2017.06.031>

Abstract

The purpose of the study is to explore the critical parameters determining the visual perception of postoperative facial symmetry.

This study retrospectively included 24 patients with skeletal class III malocclusion and double-jaw orthognathic surgery (OgS). The patients were classified according to the outcome of subjective visual perception scores (SVPS) based on the postoperative frontal images by 10 orthodontists: symmetrical surgical outcome (S group, $n = 12$) and facial asymmetry after surgery (A group, $n = 12$). The 3D dentofacial measurements from cone beam computed tomography, were compared between the S and A groups. The relationship of all variables in all patients with the SVPS was explored by Spearman correlation coefficient. Significant differences were observed in the midline parameters in the mandible, the B point, gnathion and menton, and the mandibular border axis as well as in the discrepancy of the chin morphology between the two groups ($P < 0.05$).

The findings demonstrated that the midline parameter deviation, shape of the mandibular border, and the contour of menton morphology play the major role in the visual perceptions of postoperative asymmetry.

Sleep apnea and football players

Nat Sci Sleep. 2017 Feb 21;9:31-38. doi: 10.2147/NSS.S125228. eCollection 2017.

Sleep-apnea risk and subclinical atherosclerosis in early-middle-aged retired National Football League players.

Luyster FS¹, Dunn RE², Lauderdale DS³, Carnethon MR⁴, Tucker AM⁵, Vogel RA⁶, Lincoln AE², Knutson KL⁷, Pellman EJ⁸, Strollo PJ Jr⁹.

PURPOSE:

Limited data from former National Football League (NFL) players suggest that obstructive sleep apnea (OSA) may be highly prevalent after retirement. It remains unclear whether the high prevalence of OSA in retired players is comparable to nonathletes. This retrospective analysis compared sleep apnea (SA) risk in retired NFL players to a community cohort (CARDIA Sleep study), and examined associations between SA risk and cardiovascular risk factors, including subclinical atherosclerosis.

MATERIALS AND METHODS:

Retired NFL players (n=122) were matched to CARDIA Sleep participants by age ± 2 years (range 37-55 years), body mass index ± 2 kg/m², race, and male sex. Participants underwent electron-beam computed tomography to measure coronary artery calcium (CAC) and completed the Berlin Questionnaire to determine SA risk. The presence of CAC was defined as an Agatston score >0 .

RESULTS:

Retired NFL players had a greater prevalence of high SA risk than the matched CARDIA Sleep participants (27% vs 11.5%, $P=0.002$). Compared to the CARDIA Sleep participants, retired players were less likely to smoke, and had higher blood pressure, lower fasting glucose levels, and higher cholesterol levels. However, there was no difference in the prevalence of detectable CAC (30% vs 30%, $P=1$). In both players and the community cohort, SA risk was not significantly associated with CAC after controlling for age, race, and body mass index.

CONCLUSION:

Retired NFL players have a greater prevalence of high SA risk but similar prevalence of CAC compared with a well-matched community cohort.

TMJ and HA's

Clin J Pain. 2017 Sep;33(9):835-843. doi: 10.1097/AJP.0000000000000470.

The Association Between Headaches and Temporomandibular Disorders is Confounded by Bruxism and Somatic Symptoms.

van der Meer HA¹, Speksnijder CM, Engelbert RHH, Lobbezoo F, Nijhuis-van der Sanden MWG, Visscher CM.

Author information

Abstract

OBJECTIVES:

The objective of this observational study was to establish the possible presence of confounders on the association between temporomandibular disorders (TMD) and headaches in a patient population from a TMD and Orofacial Pain Clinic.

MATERIALS AND METHODS:

Several subtypes of headaches have been diagnosed: self-reported headache, (probable) migraine, (probable) tension-type headache, and secondary headache attributed to TMD. The presence of TMD was subdivided into 2 subtypes: painful TMD and function-related TMD. The associations between the subtypes of TMD and headaches were evaluated by single regression models. To study the influence of possible confounding factors on this association, the regression models were extended with age, sex, bruxism, stress, depression, and somatic symptoms.

RESULTS:

Of the included patients (n=203), 67.5% experienced headaches. In the subsample of patients with a painful TMD (n=58), the prevalence of self-reported headaches increased to 82.8%. The associations found between self-reported headache and (1) painful TMD and (2) function-related TMD were confounded by the presence of somatic symptoms. For probable migraine, both somatic symptoms and bruxism confounded the initial association found with painful TMD.

DISCUSSION:

The findings of this study imply that there is a central working mechanism overlapping TMD and headache. Health care providers should not regard these disorders separately, but rather look at the bigger picture to appreciate the complex nature of the diagnostic and therapeutic process.

Trigeminal neuralgia

The Journal of Headache and Pain December 2017, 18:81

Single-dose botulinum toxin type a compared with repeated-dose for treatment of trigeminal neuralgia: a pilot study

Haifeng Zhang Yajun LianEmail Nanchang Xie Chen Chen Yake Zheng

Background

Several RCT studies including ours, seem to prove the role of Botulinum toxin type A (BTX-A) in the treatment of trigeminal neuralgia (TN), but no standardized dosing regimen has been established. In our study, we compare two different methods of administration: single-dose or repeated-dose strategy which was most frequently applied over the years in our centre.

Methods

An open-label trial was conducted. One hundred patients with classic TN symptoms were recruited, and randomly and equally apportioned to single- or repeated-dose group. Patients in the single-dose group received a local BTX-A injection of 70 to 100 U. The repeated-dose group received an initial BTX-A injection of 50 to 70 U and then another of equal volume 2 weeks later. All patients were followed for 6 months.

Results

In the single- and repeated-dose groups, 44 and 37, respectively, completed the entire study. The groups were statistically similar in TN frequency, time between treatment and effect, time to peak effect, VAS scores, and rates of adverse reactions (latency and duration). However, the single-dose group experienced significantly longer duration of effect ($P = 0.032$).

Conclusions

The single- and repeated-dosing BTX-A regimens were largely comparable in efficacy and safety. This study suggests that repeated dosing has no advantage over single dosing of BTX-A for TN. Dosing should be adjusted for the individual patient.

Predictors of childhood sleep disorders**Predictors of sleep disordered breathing in children: the PANIC study**

Tiina Ikävalko Matti Närhi Aino-Maija Eloranta Niina Lintu Riitta MyllykangasAnu

Vierola Henri Tuomilehto Timo Lakka Riitta Pahkala

European Journal of Orthodontics, cjsx056, <https://doi.org/10.1093/ejo/cjsx056>

Objective:

We studied longitudinally the associations of craniofacial morphology, mouth breathing, orthodontic treatment, and body fat content with the risk of having and developing sleep disordered breathing (SDB) in childhood. We hypothesized that deviant craniofacial morphology, mouth breathing, and adiposity predict SDB among children.

Materials and methods:

The participants were 412 children 6–8 years of age examined at baseline and 329 children aged 9–11 years re-examined at an average 2.2-year follow-up. An experienced orthodontist evaluated facial proportions, dental occlusion, soft tissue structures, and mode of breathing and registered malocclusions in orthodontic treatment. Body fat percentage was assessed by dual-energy X-ray absorptiometry and SDB symptoms by a questionnaire.

Results:

Children with SDB more likely had convex facial profile, increased lower facial height, mandibular retrusion, tonsillar hypertrophy, and mouth breathing at baseline and convex facial profile, mandibular retrusion, and mouth breathing at follow-up than children without SDB at these examinations. Male gender and body adiposity, mouth breathing, and distal molar occlusion at baseline were associated with SDB later in childhood. Adipose tissue under the chin, mandibular retrusion, vertically large or normal throat and malocclusion in orthodontic treatment at baseline predicted developing SDB during follow-up of among children without SDB at baseline.

Limitations:

We could not conduct polysomnographic examinations to define sleep disturbances. Instead, we used a questionnaire filled out by the parents to assess symptoms of SDB.

Conclusions:

The results indicate that among children, deviant craniofacial morphology, mouth breathing, body adiposity, and male gender seem to have implications in the pathophysiology of SDB.

Periodontal disease

Epidemiol Rev. 2017 Jan 1;39(1):49-58. doi: 10.1093/epirev/mxx006.

Periodontal Disease, Tooth Loss, and Cancer Risk.

Michaud DS, Fu Z, Shi J, Chung M.

Abstract

Periodontal disease, which includes gingivitis and periodontitis, is highly prevalent in adults and disease severity increases with age. The relationship between periodontal disease and oral cancer has been examined for several decades, but there is increasing interest in the link between periodontal disease and overall cancer risk, with systemic inflammation serving as the main focus for biological plausibility.

Numerous case-control studies have addressed the role of oral health in head and neck cancer, and several cohort studies have examined associations with other types of cancers over the past decade. For this review, we included studies that were identified from either 11 published reviews on this topic or an updated literature search on PubMed (between 2011 and July 2016). A total of 50 studies from 46 publications were included in this review. Meta-analyses were conducted on cohort and case-control studies separately when at least 4 studies could be included to determine summary estimates of the risk of cancer in relation to 1) periodontal disease or 2) tooth number (a surrogate marker of periodontal disease) with adjustment for smoking.

Existing data provide support for a positive association between periodontal disease and risk of oral, lung, and pancreatic cancers; however, additional prospective studies are needed to better inform on the strength of these associations and to determine whether other cancers are associated with periodontal disease. Future studies should include sufficiently large sample sizes, improved measurements for periodontal disease, and thorough adjustment for smoking and other risk factors.

Face shape

Eur J Orthod. 2017 Aug 1;39(4):386-394. doi: 10.1093/ejo/cjw070.

Geometric morphometric analysis of craniofacial growth between the ages of 12 and 14 in normal humans.

Katsadouris A¹, Halazonetis DJ¹.

There is great variation of growth among individuals. The question whether patients with different skeletal discrepancies grow differently is biologically interesting but also important in designing clinical trials. The aim of the present study was to evaluate whether growth direction depends on the initial craniofacial pattern.

SUBJECTS AND METHOD:

The sample consisted of 350 lateral cephalograms of 175 subjects (91 females and 84 males) followed during normal growth without any orthodontic treatment. The examined ages were 12 (T1) and 14 (T2) years. The cephalograms were obtained from the American Association of Orthodontists Foundation (AAOF) Craniofacial Growth Legacy Collection (Burlington, Fels, Iowa, and Oregon growth studies). We digitally traced 15 curves on each cephalogram, comprehensively covering the craniofacial skeleton, and located 127 points on the curves, 117 of which were sliding semilandmarks and 10 fixed. Procrustes alignment, principal component analysis and two-block partial least squares analysis were performed, after sliding the semilandmarks to minimize bending energy.

RESULTS:

The first 10 principal components (PCs) described approximately 71 per cent of the total shape variance. PC1 was related to shape variance in the vertical direction (low/high angle skeletal pattern) and PC2 was mainly related to shape variance in the anteroposterior direction (Class II/Class III pattern). PC3 was mainly related to the shape variance of the mandibular angle. All subjects shared a similar growth trajectory in shape space. We did not find any correlation between the initial shape and the magnitude of shape change between T1 and T2, but males showed a greater shape change than females. The direction of shape change was moderately correlated to the initial shape (RV coefficient: 0.14, $P < 0.001$).

CONCLUSIONS:

The initial shape of the craniofacial complex covaried weakly with the direction of shape change during growth.

TMD plasma

Endokrynol Pol. 2017;68(3):326-333. doi: 10.5603/EP.2017.0025.

[Venopunction of the cubital vein as an alternative approach for CGRP plasma level evaluation in tmd patients].

Nitecka-Buchta A¹, Marek B, Kapustecka JB, Baron S.

INTRODUCTION:

Calcitonin gene-related peptide is an important vasodilator. It plays an important role in the metabolism of chewing muscles. The aim of the study was to evaluate the plasma level of CGRP in patients with myofascial pain (RDC/TMD Ia) and myofascial pain with limited opening (RDC/TMD Ib) before and after occlusal splint therapy (Michigan splint).

MATERIAL AND METHODS:

A randomised trial was performed including 39 patients (males = 3, females = 36). Blood samples were taken from the external jugular vein (JUG) and cubital vein (CUB) before and after 30 days of occlusal splint therapy. Plasma levels of CGRP were measured with ELISA KIT for Human Calcitonin Gene Related Peptide (CGRP) 96T (USCNK Business Co. Ltd.).

RESULTS:

The results of the study show that the plasma CGRP level was higher in the external jugular vein (JUG1 = 5.07pg/mL [SD = 1.99]) than in cubital vein (CUB1 = 4.3 pg/mL [SD = 1.6]). After 30 days of the occlusal splint therapy the levels in both veins increased: JUG2 = 6.07 pg/mL (SD = 2.19), and CUB2 = 4.9 pg/mL (SD = 1.4). The CGRP plasma level increase was statistically significant only in the external jugular vein (JUG) ($p < 0.05$). Statistically significant pain intensity reduction was observed: VAS1 = 5.4 (SD = 2.08) decreased to VAS2 = 1.7 (SD = 2.07) after splint therapy ($p < 0.05$).

CONCLUSIONS:

Venepuncture of an external jugular vein is more precise, than venepuncture of a cubital vein in evaluating CGRP plasma level changes in patients with TMD.

14. HEADACHES

Clin J Pain. 2017 Sep;33(9):835-843. doi: 10.1097/AJP.0000000000000470.

The Association Between Headaches and Temporomandibular Disorders is Confounded by Bruxism and Somatic Symptoms.

van der Meer HA¹, Speksnijder CM, Engelbert RHH, Lobbezoo F, Nijhuis-van der Sanden MWG, Visscher CM.

Author information

Abstract

OBJECTIVES:

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MATERIALS AND METHODS:

Several subtypes of headaches have been diagnosed: self-reported headache, (probable) migraine, (probable) tension-type headache, and secondary headache attributed to TMD. The presence of TMD was subdivided into 2 subtypes: painful TMD and function-related TMD. The associations between the subtypes of TMD and headaches were evaluated by single regression models. To study the influence of possible confounding factors on this association, the regression models were extended with age, sex, bruxism, stress, depression, and somatic symptoms.

RESULTS:

Of the included patients (n=203), 67.5% experienced headaches. In the subsample of patients with a painful TMD (n=58), the prevalence of self-reported headaches increased to 82.8%. The associations found between self-reported headache and (1) painful TMD and (2) function-related TMD were confounded by the presence of somatic symptoms. For probable migraine, both somatic symptoms and bruxism confounded the initial association found with painful TMD.

DISCUSSION:

The findings of this study imply that there is a central working mechanism overlapping TMD and headache. Health care providers should not regard these disorders separately, but rather look at the bigger picture to appreciate the complex nature of the diagnostic and therapeutic process.

Pediatric HA

Adolesc Health Med Ther. 2016 Apr 21;7:59-66. doi: 10.2147/AHMT.S97925. eCollection 2016.

Psychological predictors of headache remission in children and adolescents.

Carasco M¹, Kröner-Herwig B¹.

OBJECTIVE:

Longitudinal studies on headaches often focus on the identification of risk factors for headache occurrence or "chronification". This study in particular examines psychological variables as potential predictors of headache remission in children and adolescents.

METHODS:

Data on biological, social, and psychological variables were gathered by questionnaire as part of a large population-based study (N=5,474). Children aged 9 to 15 years who suffered from weekly headaches were selected for this study sample, N=509. A logistic regression analysis was conducted with remission as the dependent variable. In the first step sex, age, headache type, and parental headache history were entered as the control variables as some data already existed showing their predictive power. Psychological factors (dysfunctional coping strategies, internalizing symptoms, externalizing symptoms, anxiety sensitivity, somatosensory amplification) were entered in the second step to evaluate their additional predictive value.

RESULTS:

Highly dysfunctional coping strategies reduced the relative probability of headache remission. All other selected psychological variables reached no significance, ie, did not contribute additionally to the explanation of variance of the basic model containing sex and headache type. Surprisingly, parental headache and age were not predictive. The model explained only a small proportion of the variance regarding headache remission ($R(2) = 0.09$ [Nagelkerke]).

CONCLUSION:

Successful coping with stress in general contributed to remission of pediatric headache after 2 years in children aged between 9 and 15 years. Psychological characteristics in general had only small predictive value. The issue of remission definitely needs more scientific attention in empirical studies.

19. GLENOHUMERAL/SHOULDER**Work and shoulder problems**

Occup Environ Med. 2017 Jul 29. pii: oemed-2017-104339. doi: 10.1136/oemed-2017-104339.

Work-related risk factors for specific shoulder disorders: a systematic review and meta-analysis.

van der Molen HF^{1,2,3}, Foresti C⁴, Daams JG^{1,2,3}, Frings-Dresen MHW^{1,2,3}, Kuijjer PPFM^{1,2,3}.

The objective of this systematic review and meta-analysis is to examine which work-related risk factors are associated with specific soft tissue shoulder disorders.

We searched the electronic databases of Medline and Embase for articles published between 2009 and 24 March 2016 and included the references of a systematic review performed for the period before 2009. Primary cross-sectional and longitudinal studies were included when outcome data were described in terms of clinically assessed soft tissue shoulder disorders and at least two levels of work-related exposure were mentioned (exposed vs less or non-exposed). Two authors independently selected studies, extracted data and assessed study quality. For longitudinal studies, we performed meta-analyses and used GRADE (Grades of Recommendations, Assessment, Development and Evaluation) to assess the evidence for the associations between risk factors and the onset of shoulder disorders. Twenty-seven studies met the inclusion criteria. In total, 16 300 patients with specific soft tissue shoulder disorders from a population of 2 413 722 workers from Denmark, Finland, France, Germany and Poland were included in the meta-analysis of one case-control and six prospective cohort studies. This meta-analysis revealed moderate evidence for associations between shoulder disorders and arm-hand elevation (OR=1.9, 95% CI 1.47 to 2.47) and shoulder load (OR=2.0, 95% CI 1.90 to 2.10) and low to very low evidence for hand force exertion (OR=1.5, 95% CI 1.25 to 1.87), hand-arm vibration (OR=1.3, 95% CI 1.01 to 1.77), psychosocial job demands (OR=1.1, 95% CI 1.01 to 1.25) and working together with temporary workers (OR=2.2, 95% CI 1.2 to 4.2).

Low-quality evidence for no associations was found for arm repetition, social support, decision latitude, job control and job security.

Moderate evidence was found that arm-hand elevation and shoulder load double the risk of specific shoulder disorders.

Low to very-low-quality evidence was found for an association between hand force exertion, hand-arm vibration, psychosocial job demands and working together with temporary workers and the incidence of specific shoulder disorders.

20 A. ROTATOR CUFF**Cuff tear progression**

J Shoulder Elbow Surg. 2017 Jul 19. pii: S1058-2746(17)30309-9. doi: 10.1016/j.jse.2017.05.023.

Shoulder activity level and progression of degenerative cuff disease.

Keener JD¹, Skelley NW², Stobbs-Cucchi G², Steger-May K³, Chamberlain AM², Aleem AW², Brophy RH².

BACKGROUND:

This study prospectively examined the relationship of direct and indirect measures of shoulder activity with the risks of tear progression and pain development in subjects with an asymptomatic degenerative rotator cuff tear.

METHODS:

A cohort of asymptomatic degenerative rotator cuff tears was prospectively monitored annually, documenting tear size progression with ultrasound imaging and potential shoulder pain development. Shoulder activity level, self-reported occupational and physical demand level, and hand dominance were compared with risks of tear enlargement and future pain development.

RESULTS:

The study monitored 346 individuals with a mean age of 62.1 years for a median duration of 4.1 years (interquartile range [IQR], 2.4-7.9 years). Tear enlargement was seen in 177 shoulders (51.2%), and pain developed in 161 shoulders (46.5%) over time. Tear presence in the dominant shoulder was associated with a greater risk of tear enlargement (hazard ratio, 1.40; P = .03) and pain development (hazard ratio, 1.63; P = .002). Shoulder activity level (P = .37) and occupational demand level (P = .62) were not predictive of tear enlargement. Occupational demand categories of manual labor (P = .047) and "in between" (P = .045) had greater risks of pain development than sedentary demands. The median shoulder activity score for shoulders that became painful was lower than for shoulders that remained asymptomatic (10.0 [IQR, 7.0-13.0] vs. 11.0 [IQR, 8.0-14.0], P = .02).

CONCLUSIONS:

Tear enlargement and pain development in asymptomatic tears are more common with involvement of the dominant shoulder. Shoulder activity level is not related to tear progression risks. Pain development is associated with a lower shoulder activity level even though patients with higher occupational demands are more likely to develop pain.

26. CARPAL TUNNEL SYNDROME

Cortisone and CT

Plast Reconstr Surg. 2017 Aug;140(2):338-347. doi: 10.1097/PRS.0000000000003511.

Corticosteroid Injections for Carpal Tunnel Syndrome: Long-Term Follow-Up in a Population-Based Cohort.

Evers S¹, Bryan AJ, Sanders TL, Gunderson T, Gelfman R, Amadio PC.

Author information

Abstract

BACKGROUND:

Corticosteroid injection is a recommended treatment option for carpal tunnel syndrome, before considering surgery. Nevertheless, injections remain controversial because there is strong evidence of only short-term benefits. This study aimed to determine the reintervention rate and to identify prognostic indicators for subsequent treatment after corticosteroid injection for carpal tunnel syndrome.

METHODS:

This study evaluated residents of Olmsted County treated with a corticosteroid injection for carpal tunnel syndrome between 2001 and 2010. Treatment failure was the primary outcome of interest. Two definitions for failure were examined: (1) the patient receiving subsequent procedural intervention and (2) the patient undergoing carpal tunnel release. Survival was estimated using Kaplan-Meier methods, and association of covariates with increased failure was modeled using Cox proportional hazards regression.

RESULTS:

The study included 774 affected hands in 595 patients. The median follow-up period was 7.4 years. Reintervention was performed in 68 percent of cases, of which 63 percent resulted in eventual surgery. Injectate volume was significant for the outcome of any retreatment [hazard ratio, 0.879 (95 percent CI, 0.804 to 0.96)] and surgery [hazard ratio, 0.906 (95 percent CI, 0.827 to 0.99)]. Rheumatoid arthritis was also significant in both models, with a hazard ratio of 0.627 (95 percent CI, 0.404 to 0.97) for any retreatment and 0.493 (95 percent CI, 0.292 to 0.83) for surgery.

CONCLUSIONS:

In this cohort, 32 percent of patients did not receive subsequent treatment after a single injection, which indicates that there is a therapeutic role for corticosteroid injections in treating carpal tunnel syndrome. Further research is necessary to identify those patients who will benefit from an injection, to provide more individually tailored treatment.

Increased risk with fluoroquinolone use

Clin Infect Dis. 2017 Apr 24. doi: 10.1093/cid/cix362

Fluoroquinolone Use and Risk of Carpal Tunnel Syndrome: A Pharmacoepidemiologic Study.

Cheng JZ¹, Sodhi M^{2,3}, Etminan M², Carleton BC^{4,5,6}.

Fluoroquinolone (FQ) induced peripheral neuropathies and tendinopathies are well documented, but there are no epidemiologic studies on the risk of carpal tunnel syndrome (CTS). We conducted a case-control study of over 6 million patients. FQ use is associated with increased risk of CTS (RR = 1.34, 95% CI 1.31 - 1.37).

37. OSTEOARTHRITIS/KNEE**Knee replacement OA and falls**

Age Ageing. 2016 Nov;45(6):794-800. Epub 2016 Jul 4.

A longitudinal comparative study of falls in persons with knee arthroplasty and persons with or at high risk for knee osteoarthritis.

L Riddle D¹, J Golladay G².

OBJECTIVES:

we determined the yearly prevalence of single and multiple falls in persons with or at risk of knee osteoarthritis (OA) and persons undergoing knee arthroplasty over an 8-year period. We also compared annual fall rates among persons with and without knee arthroplasty to determine if fall rates are associated with knee arthroplasty.

METHODS:

we studied 4,200 persons from the Osteoarthritis Initiative (OAI), a National Institutes of Health funded prospective study of persons 45-79 years and conducted from 2004 to 2012. All either had knee OA or were at risk of developing knee OA but did not have knee arthroplasty. The surgical group comprised 413 persons who underwent knee arthroplasty. Key fall risk factors were assessed at yearly study visits. Graphical depictions illustrated single and multiple fall trajectories. Multinomial regression adjusted for potential confounders compared fall rates for those with and without knee arthroplasty.

RESULTS:

fall rate trajectories for the two samples were generally flat and fall rates were similar. For the arthroplasty sample, fall rates did not increase in the immediate perioperative period relative to earlier and later periods. No differences in fall rates were found among the arthroplasty and non-arthroplasty samples after adjustment for potential confounding ($P > 0.05$).

CONCLUSIONS:

fall rates were generally stable and similar over an 8-year period among persons with and without knee arthroplasty. Clinicians should not assume that persons undergoing knee arthroplasty are at greater risk for falls either before or after surgery as compared to persons with or at risk for knee OA.

Paraspinal muscles and knee OA

Maintenance of the paraspinal muscles may protect against radiographic knee osteoarthritis

Authors Azuma K, Sera Y, Shinjo T, Takayama M, Shiomi E, Momoshima S, Iwao Y, Ishida H, Matsumoto H

DOI <https://doi.org/10.2147/OARRR.S130688>

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Background: Knee osteoarthritis (OA) is an increasing health problem worldwide. So far, only obesity and quadriceps weakness are identified as modifiable risk factors for knee OA. Core muscle strengthening is becoming increasingly popular among older adults because of its ability to enhance the activities of daily living during old age. This study investigated the associations of the size and quality of the abdominal trunk muscles with radiographic knee osteoarthritis (RKOA).

Methods: From 2012 to 2016, data were collected from 146 males and 135 females (age 63.9 ± 13.4 years, BMI 23.2 ± 3.8 kg/m²) at annual musculoskeletal examinations, including knee radiographs and body composition analyses, by dual-energy X-ray absorptiometry. Cross-sectional areas of abdominal trunk muscles were measured using a single-slice computed tomography scan image obtained at the level of the umbilicus.

Results: The prevalence of RKOA was 21.2% in males and 28.1% in females. Compared to subjects without RKOA, subjects with RKOA were ~6 years older and had smaller paraspinal muscle (38.4 ± 8.7 vs 33.1 ± 10.1 cm², $p < 0.01$ in males; 24.1 ± 7.1 vs 20.7 ± 7.5 cm², $p < 0.05$ in females). In contrast, there was no decrease in appendicular or total lean mass, and only in females, BMI and total fat mass (FM) were higher in subjects with RKOA (21.5 ± 3.5 vs 24.5 ± 4.4 kg/m², 16.7 ± 7.0 vs 20.5 ± 7.7 kg, respectively, both $p < 0.01$). After adjusting for age and sex, smaller cross-sectional area/lower attenuation value of the paraspinal muscles was associated with RKOA (both $p < 0.05$), while greater appendicular or total lean mass as well as greater FM was associated with RKOA. The size and quality of the paraspinal muscles were not associated with knee pain or habitual exercise.

Conclusion: Small, poor-quality paraspinal muscles may be linked to a higher risk of RKOA, but appendicular or total lean mass was not a good predictor of RKOA.

Bracing helps synovitis

BMC Musculoskelet Disord. 2017 Aug 10;18(1):347. doi: 10.1186/s12891-017-1691-1.

With a biomechanical treatment in knee osteoarthritis, less knee pain did not correlate with synovitis reduction.

Swaminathan V^{1,2}, Parkes MJ^{3,4}, Callaghan MJ^{3,4,5,6}, O'Neill TW^{3,4,7}, Hodgson R⁸, Gait AD⁸, Felson DT^{3,4,9}.

BACKGROUND:

Braces are used to treat pain in patellofemoral joint osteoarthritis (PFJOA). In a trial, we previously reported pain improvement after 6-weeks brace use. The pain reduction did not correlate with changes in Magnetic Resonance Imaging (MRI) assessed Bone Marrow Lesion volume or static synovial volume. Studies show that changes in the synovium on dynamic contrast enhanced (DCE) MRI are more closely associated with symptom change than static synovial volume changes. We hypothesised change in synovitis assessed using dynamic imaging could explain the reduction in pain.

METHOD:

One hundred twenty-six men and women aged 40-70 years with painful radiographically confirmed PFJOA were randomised to either brace wearing or no brace for 6-weeks. Pain assessment and DCE-MRI were performed at baseline and 6 weeks. DCE data was analysed using Tofts's equation. Pain measures included a VAS of pain on nominated aggravating activity (VAS_{NA}), and the KOOS pain subscale. Paired t-tests were used to determine within person change in outcome measures and Spearman's correlation coefficients were used to determine the correlation between change in pain and change in the DCE parameters.

RESULTS:

Mean age of subjects was 55.5 years (SD = 7.5) and 57% were female. There was clear pain improvement in the brace users compared to controls (VAS_{NA} - 16.87 mm, p = <0.001). There was no significant change to the dynamic synovitis parameters among brace users nor was pain change correlated with change in dynamic synovitis parameters.

CONCLUSION:

The reduction in knee pain following brace wearing in patients with PFJOA is not explained by changes in synovitis.

OA varus thrust

Arthritis Rheumatol. 2017 Aug 3. doi: 10.1002/art.40224.

Varus Thrust and Incident and Progressive Knee Osteoarthritis.

Sharma L¹, Chang AH², Jackson RD³, Nevitt M⁴, Moio KC², Hochberg M⁵, Eaton C⁶, Kwok CK⁷, Almagor O¹, Cauley J⁸, Chmiel JS⁹.

BACKGROUND:

To determine if varus thrust, bowing-out of the knee during gait, i.e., the first appearance or worsening of varus alignment during stance, is associated with incident and progressive knee osteoarthritis (OA), we undertook an Osteoarthritis Initiative ancillary study. We further considered hypothesized associations adjusted for static alignment, anticipating some attenuation.

METHODS:

2-3 trained examiners/site at 4 sites observed gait. In eligible knees, incident OA was analyzed as subsequent incident KL \geq 2, whole and partial-grade medial joint space narrowing (JSN), and annualized loss of joint space width (JSW), and progression as medial JSN and JSW loss. Outcomes were assessed over up to 7 years of follow-up. Analyses were knee-level, using multivariable logistic and linear regression with GEE to account for between-limb correlation.

RESULTS:

The incident OA sample included 4187 knees/2610 persons; the progression sample included 3421 knees/2284 persons. In knees with OA, thrust was associated with progression by each outcome adjusting for age, gender, BMI, and pain. In knees without OA, varus thrust was not associated with incident OA or other outcomes. After adjustment for alignment, the thrust/progression association was attenuated but an independent association persisted for partial grade JSN and JSW loss outcome models. WOMAC Pain and alignment were consistently associated with all outcomes. Within the stratum of varus knees, thrust was associated with an increased risk of progression.

CONCLUSIONS:

Varus thrust visualized during gait is associated with knee OA progression and should be a target of intervention development. This article is protected by copyright. All rights reserved.

44. RHUMATOID ARTHRITIS

Pain Catastrophizing

Arthritis Care Res (Hoboken). 2017 Aug 13. doi: 10.1002/acr.23339.

Pain catastrophizing is strongly associated with subjective outcomes, but not with inflammatory assessments in rheumatoid arthritis patients.

Hammer HB¹, Uhlig T¹, Kvien TK¹, Lampa J².

OBJECTIVES:

Pain catastrophizing is conceptualized as a negative cognitive-affective response to anticipated or actual pain and has been associated with important pain-related outcomes. The objective of this prospective study of established rheumatoid arthritis (RA) patients was to explore how pain catastrophizing was related to patient-reported outcomes (PROs), composite scores and assessments of inflammatory activity.

METHODS:

RA patients starting bDMARD were examined at baseline and after 1, 2, 3, 6 and 12 months with PROs (joint pain/patient's global VAS, MHAQ, RAID score), clinical and laboratory assessments (tender/swollen joint count, assessor's global VAS, ESR/CRP), ultrasound (US) (grey scale/power Doppler of 36 joints and 4 tendons) and pain catastrophizing. The composite scores DAS28, CDAI and SDAI were calculated. Statistical calculations included independent samples T-test, paired samples T-test, one-way ANOVA, Pearson's correlations, linear and logistic regression.

RESULTS:

Of 209 patients included, 152 (72.7%) completed 12 months follow-up. Pain catastrophizing, PROs, clinical and inflammatory assessments decreased significantly ($p < 0.001$). Pain catastrophizing was strongly correlated with the PROs and composite scores ($p < 0.001$) but not with the inflammatory parameters (swollen joint count, CRP, GS/PD US). Patients with higher levels of pain catastrophizing had higher PROs and composite scores during the study ($p < 0.001$) but not inflammatory assessments. Baseline pain catastrophizing was negatively associated with achievement of remission at 6 and 12 months ($p < 0.05$).

CONCLUSIONS:

Pain catastrophizing was strongly associated with PROs and composite measures, but not markers of inflammation. High levels of pain catastrophizing reduced the likelihood of achieving composite score remission and should be a factor to consider in a treat to target strategy. This article is protected by copyright. All rights reserved.

45 A. MANUAL THERAPY LUMBAR & GENERAL**Comparison of manip to mob**

J Pain. 2017 Aug 8. pii: S1526-5900(17)30659-4. doi: 10.1016/j.jpain.2017.07.007.

Comparison of two lumbar manual therapies on temporal summation of pain in healthy volunteers.

Penza CW¹, Horn ME², George SZ³, Bishop MD⁴.

The purpose of this study was to compare the immediate change in temporal summation of heat pain (TSP) between spinal manipulation (SMT) and spinal mobilization (MOB) in healthy volunteers. Ninety-two volunteers (24 males; 23.8 ± 5.3 years) were randomized to receive SMT, MOB or no treatment (REST) for one session. Primary outcomes were changes in TSP, measured at the hand and foot, immediately following the session. A planned subgroup analysis investigated effects across empirically derived TSP clusters.

PRIMARY OUTCOME:

There were no differences in the immediate change in TSP measured at the foot between SMT and MOB, however both treatments were superior to the REST condition. Subgroup analysis: The response to a standard TSP protocol was best characterized by three clusters: 52% no change (n = 48, 52%); facilitatory response (n = 24, 26%), and inhibitory response (n = 20, 22%). There was a significant time by treatment group by cluster interaction for TSP measured at the foot. The inhibitory cluster showed the greatest attenuation of TSP following SMT and MOB when compared to REST. These data suggest lumbar manual therapies of different velocities produce a similar localized attenuation of TSP, compared to no treatment. Attenuation of localized pain facilitatory processes by manual therapies was greatest in pain-free individuals who demonstrate an inhibitory TSP response.

PERSPECTIVE:

The attenuation of pain facilitatory measures may serve an important underlying role in the therapeutic response to manual therapies. Identifying patients in pain who still have an inhibitory capacity (i.e. an inhibitory response subgroup) may be useful clinically in identifying the elusive "manual therapy" responder.

48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE

Cupping and Acupuncture in LBP

Clinical effects of laser acupuncture plus Chinese cupping on the pain and plasma cortisol levels in patients with chronic nonspecific lower back pain: A randomized controlled trial Evidence-based Complementary and Alternative Medicine

Lin ML, et al.

An analysis was performed to assess the effectiveness of laser acupuncture plus Chinese cupping in lower back pain (LBP) treatment. In chronic nonspecific LBP, laser acupuncture plus Chinese cupping at the Weizhong (BL40) and Ashi acupoints effectively reduced pain and inflammation. For LBP treatment, this therapy could be a suitable option in clinical settings.

Methods

- The researchers enrolled patients with chronic nonspecific LBP for a randomized controlled trial.
- They assigned them to the laser acupuncture group (laser acupuncture plus Chinese cupping) and control group (sham laser plus Chinese cupping).
- They applied laser acupuncture (808 nm; 40 mW; 20 Hz; 15 J/cm²) and Chinese cupping on the Weizhong (BL40) and Ashi acupoints for 5 consecutive days.
- They assessed plasma cortisol levels before and after the 5-day treatment session.
- They recorded the visual analog scale (VAS) scores at baseline and throughout the 5-day treatment session.

Results

- The plasma cortisol levels and VAS scores decreased significantly in both groups after the treatment session.
- The VAS scores decreased significantly on days 4 and 5 in the laser acupuncture group, and an enhanced reduction in VAS scores was observed.

51. CFS/BET**Back school**

J Clin Nurs. 2017 Aug 3. doi: 10.1111/jocn.13981.

Back School programme for nurses has reduced low back pain levels: a randomized controlled trial.

Járomi M¹, Kukla A², Szilágyi B³, Ugron Á⁴, Kovácsné Bobály V⁵, Makai A⁵, Linek P⁶, Ács P⁷, Leidecker E³.

BACKGROUND:

Millions of nurses around the world suffer from occupational-related chronic non-specific low back pain (cnsLBP). Generally, LBP in nurses is a result of increased pressure on the spine, and can be associated with improperly conducted patient lifting techniques.

AIMS AND OBJECTIVES:

The purposes of the study were: 1) to examine patient lifting techniques used by nurses; and 2) to evaluate an effectiveness of the Spine Care for Nurses programme in cnsLBP reduction and the execution of proper patient lifting techniques.

METHODS:

A randomized controlled trial was conducted among 137 nurses with cnsLBP. Participants were randomized into an experimental and control group (experimental group n=67, control group n=70). Nurses in the experimental group attended the Spine Care for Nurses programme for three months. The programme consisted of didactic education, spine-strengthening exercises, and education on safe patient handling techniques. The control group only received a brief written lifestyle guidance. The Zebris WinSpine Triple Lumbar examination was utilised to analyse nurses' patient lifting techniques (horizontal and vertical lifting). The lumbar pain intensity was measured with a 0-100 Visual Analogue Scale (VAS).

RESULTS:

The pre-intervention average cnsLBP intensity score on VAS decreased from 49.3, to the post-intervention score of 7.5. The correct execution of vertical lifting techniques in the experimental group increased from 8.91% to 97.01% (control group: 8.57% pre and post 11.42%). The horizontal patient lifting technique pre-intervention increased from 10.44% to 100% correct execution in the experimental group (control group: pre 10.00% and post 11.42%).

CONCLUSION:

The Spine Care for Nurses programme significantly reduced cnsLBP and increased the number of properly executed horizontal and vertical patient lifting techniques in nurses. This article is protected by copyright. All rights reserved.

52. EXERCISE**Low frequency exercise helps elderly****Effects of different strength training frequencies on maximum strength, body composition and functional capacity in healthy older individuals**

Experimental Gerontology

Turpela M, et al.

This study investigated the impacts of training frequency on maximum strength, muscle mass and functional capacity over 6 months following an initial 3-month preparatory strength training period in healthy older individuals. It was not evident in the findings that higher training frequency would induce greater benefit to maximum walking speed (i.e. functional capacity) despite a clear dose-response in dynamic 1-RM strength, at least when predominantly using machine weight-training. In previously untrained study participants, low frequency training (i.e. 1–2 times per week) seemed to provide beneficial functional capacity improvements.

Methods

- Researchers randomly assigned 106, 64–75 year old volunteers to one of 4 groups; performing strength training one (EX1), two (EX2), or three (EX3) times per week and a non-training control (CON) group.
- Whole-body strength training was performed using 2–5 sets and 4–12 repetitions per exercise and 7–9 exercises per session.
- Researchers measured, before and after the intervention, maximum dynamic leg press (1-RM) and isometric knee extensor and plantarflexor strength, body composition and quadriceps cross-sectional area, as well as functional capacity (maximum 7.5 m forward and backward walking speed, timed-up-and-go test, loaded 10-stair climb test).

Results

- Findings demonstrated that all experimental groups increased leg press 1-RM more than CON (EX1: $3 \pm 8\%$, EX2: $6 \pm 6\%$, EX3: $10 \pm 8\%$, CON: $-3 \pm 6\%$, $P < 0.05$) and EX3 improved more than EX1 ($P = 0.007$) at month 9.
- Researchers observed that compared to CON, EX3 improved in backward walk ($P = 0.047$) and EX1 in timed-up-and-go ($P = 0.029$) tests.
- Data showed that no significant changes occurred in body composition.

Exercise and CA

Epidemiol Rev. 2017 Jan 1;39(1):71-92. doi: 10.1093/epirev/mxx007.

The Impact of Exercise on Cancer Mortality, Recurrence, and Treatment-Related Adverse Effects.

Cormie P, Zopf EM, Zhang X, Schmitz KH.

Abstract

The combination of an increasing number of new cancer cases and improving survival rates has led to a large and rapidly growing population with unique health-care requirements.

Exercise has been proposed as a strategy to help address the issues faced by cancer patients. Supported by a growing body of research, major health organizations commonly identify the importance of incorporating exercise in cancer care and advise patients to be physically active. This systematic review comprehensively summarizes the available epidemiologic and randomized controlled trial evidence investigating the role of exercise in the management of cancer. Literature searches focused on determining the potential impact of exercise on 1) cancer mortality and recurrence and 2) adverse effects of cancer and its treatment. A total of 100 studies were reviewed involving thousands of individual patients whose exercise behavior was assessed following the diagnosis of any type of cancer.

Compared with patients who performed no/less exercise, patients who exercised following a diagnosis of cancer were observed to have a lower relative risk of cancer mortality and recurrence and experienced fewer/less severe adverse effects.

The findings of this review support the view that exercise is an important adjunct therapy in the management of cancer. Implications on cancer care policy and practice are discussed.

53. CORE**Multifidus exercise in LBP**

Spine (Phila Pa 1976). 2017 Aug 1;42(15):E876-E882. doi: 10.1097/BRS.0000000000001989.

Effects of Low-Load Motor Control Exercises and a High-Load Lifting Exercise on Lumbar Multifidus Thickness: A Randomized Controlled Trial.

Berglund L¹, Aasa B, Michaelson P, Aasa U.

STUDY DESIGN:

Randomized controlled trial.

OBJECTIVE:

The aim of this study was to compare the effects of low-load motor control (LMC) exercises and a high-load lifting (HLL) exercise, on lumbar multifidus (LM) thickness on either side of the spine and whether the effects were affected by pain intensity or change in pain intensity.

SUMMARY OF BACKGROUND DATA:

There is evidence that patients with low back pain (LBP) may have a decreased size of the LM muscles with an asymmetry between sides in the lower back. It has also been shown that LMC training can affect this asymmetry. It is, however, not known whether a high-load exercise has the same effect.

METHODS:

Sixty-five participants diagnosed with nociceptive mechanical LBP were included and randomized into LMC exercises or a HLL exercise, the deadlift. The LM thickness was measured using rehabilitative ultrasound imaging (RUSI), at baseline and after a 2-month training period.

RESULTS:

There were no differences between interventions regarding effect on LM muscle thickness. However, the analysis showed a significant effect for asymmetry. The thickness of the LM muscle on the small side increased significantly compared with the large side in both intervention groups, without influence of pain at baseline, or change in pain intensity.

CONCLUSION:

At baseline, there was a difference in thickness of the LM muscles between sides. It seems that exercises focusing on spinal alignment may increase the thickness of the LM muscles on the small side, irrespective of exercise load. The increase in LM thickness does not appear to be mediated by either current pain intensity or the magnitude of change in pain intensity.

54. POSTURE**Dancers alignment**

Open Access J Sports Med. 2016 Nov 16;7:161-166. eCollection 2016.

Single-leg squats can predict leg alignment in dancers performing ballet movements in "turnout".

Hopper LS¹, Sato N², Weidemann AL¹.

Author information**Abstract**

The physical assessments used in dance injury surveillance programs are often adapted from the sports and exercise domain.

Bespoke physical assessments may be required for dance, particularly when ballet movements involve "turning out" or external rotation of the legs beyond that typically used in sports. This study evaluated the ability of the traditional single-leg squat to predict the leg alignment of dancers performing ballet movements with turnout. Three-dimensional kinematic data of dancers performing the single-leg squat and five ballet movements were recorded and analyzed. Reduction of the three-dimensional data into a one-dimensional variable incorporating the ankle, knee, and hip joint center positions provided the strongest predictive model between the single-leg squat and the ballet movements.

The single-leg squat can predict leg alignment in dancers performing ballet movements, even in "turned out" postures. Clinicians should pay careful attention to observational positioning and rating criteria when assessing dancers performing the single-leg squat.

Posture in elderly

Comparison of spinal alignment, muscular strength, and quality of life between women with postmenopausal osteoporosis and healthy volunteers

Osteoporosis International

Miyakoshi N, et al.

sponsor

In this present study, the experts compared the spinal alignment, muscular strength, and quality of life (QOL) between women with postmenopausal osteoporosis and healthy volunteers. Their investigations suggested that lower QOL in osteoporosis patients was probably associated with increased thoracic kyphosis, reduced lean muscle mass, and generalized muscle weakness.

Methods

- This study included 236 female patients with postmenopausal osteoporosis (mean age, 68.7 years) and 93 healthy volunteer women (mean age, 71.0 years).
- Between groups, body mass index (BMI), angles of spinal kyphosis, back extensor strength, grip strength, and QOL were compared.

Results

- In the volunteer group, BMI, back extensor strength, and grip strength were significantly higher than in the osteoporosis group ($p < 0.01$).
- In the osteoporosis group, both thoracic kyphosis and lumbar lordosis were significantly greater than in the volunteer group ($p < 0.01$).
- With regard to QOL, the 36–Item Short–Form Health Survey (SF–36) subscale scores of role physical, bodily pain, general health, and role emotional were all significantly lower in the osteoporosis group than in the volunteer group ($p < 0.05$ each).
- SF–36 physical component summary (PCS) score was significantly lower in the osteoporosis group than in the volunteer group ($p < 0.001$).
- In the osteoporosis group, SF–36 PCS score correlated positively with thoracic kyphosis and negatively with BMI ($p < 0.05$ each).

56. ATHLETICS**Injury prevention in ski racers**

Open Access J Sports Med. 2017 May 11;8:113-122. doi: 10.2147/OAJSM.S133811. eCollection 2017.

Injuries and illnesses in a cohort of elite youth alpine ski racers and the influence of biological maturity and relative age: a two-season prospective study.

Müller L¹, Hildebrandt C^{1,2}, Müller E³, Oberhoffer R², Raschner C¹.

BACKGROUND:

Studies on injuries and illnesses involving youth ski racers younger than 15 years are lacking in the literature. The aim of this study was prospectively to assess the incidence, prevalence, and severity of traumatic and overuse injuries, as well as illnesses of elite youth ski racers with regard to sex, biological maturity status, and relative age.

SUBJECTS AND METHODS:

A prospective, longitudinal cohort design was used to monitor the anthropometrics, training characteristics, traumatic and overuse injuries, and illnesses of 82 elite youth ski racers (51 males, 31 females, age 9-14 years) over 2 consecutive years. The exact training exposure (skiing and athletic) was recorded. Relative age and estimated biological maturity status were assessed.

RESULTS:

Relatively low injury incidence or prevalence (traumatic, 0.86/1,000 hours of training; overuse, 0.28/1,000 hours) and comparably high illness prevalence (2.4/athlete) were reported. The knee was the most commonly affected body part (traumatic injuries 36.5%, overuse injuries 82%). A high number of bone fractures were revealed (46%), while no stress fractures occurred; 66% of the illnesses were respiratory tract infections. No differences were found between males and females, the differing maturity groups, or relative age quartiles. Early-maturing athletes had comparably low traumatic and overuse-injury rates. Relatively younger athletes had low traumatic injury rates.

CONCLUSION:

The injury-prevention measures implemented in the training process of youth ski racers seem to contribute to a low incidence of injury. Biological maturity status should be considered in the training process to prevent injuries in late-maturing athletes.

Muscle tear and PRP

Arthroscopy. 2017 Aug 8. pii: S0749-8063(17)30680-1. doi: 10.1016/j.arthro.2017.06.039.

Does Platelet-Rich Plasma Lead to Earlier Return to Sport When Compared With Conservative Treatment in Acute Muscle Injuries? A Systematic Review and Meta-analysis.

Sheth U¹, Dwyer T², Smith I³, Wasserstein D⁴, Theodoropoulos J², Takhar S³, Chahal J⁵.

PURPOSE:

To compare the time to return to sport and reinjury rate after platelet-rich plasma (PRP) injection versus control therapy (i.e., physiotherapy or placebo injection) in patients with acute grade I or II muscle strains.

METHODS:

All eligible studies comparing PRP against a control in the treatment of acute (≤ 7 days) grade I or II muscle strains were identified. The primary outcome was time to return to play. The secondary outcome was the rate of reinjury at a minimum of 6 months of follow-up. Subgroup analysis was performed to examine the efficacy of PRP in hamstring muscle strains alone. The checklist to evaluate a report of a nonpharmacologic trial (CLEAR-NPT) was used to assess the quality of studies.

RESULTS:

Five randomized controlled trials including a total of 268 patients with grade I and II acute muscle injuries were eligible for review. The pooled results revealed a significantly earlier return to sport for the PRP group when compared with the control group (mean difference, -5.57 days [95% confidence interval, -9.57 to -1.58]; $P = .006$). Subgroup analysis showed no difference in time to return to sport when comparing PRP and control therapy in grade I and II hamstring muscle strains alone ($P = .19$). No significant difference was noted in the rate of reinjury between the 2 groups ($P = .50$) at a minimum of 6 months of follow-up.

CONCLUSIONS:

Evidence from the current literature, although limited, suggests that the use of PRP may result in an earlier return to sport among patients with acute grade I or II muscle strains without significantly increasing the risk of reinjury at 6 months of follow-up. However, no difference in time to return to sport was revealed when specifically evaluating those with a grade I or II hamstring muscle strain.

Hamstring tears and return to soccer

Br J Sports Med. 2017 Aug;51(16):1221-1226. doi: 10.1136/bjsports-2016-097131. Epub 2017 Feb 28.

Return to play criteria after hamstring muscle injury in professional football: a Delphi consensus study.

Zambaldi M^{1,2}, Beasley I³, Rushton A².

BACKGROUND:

Hamstring muscle injury (HMI) is the most common injury in professional football and has a high re-injury rate. Despite this, there are no validated criteria to support return to play (RTP) decisions.

AIM:

To use the Delphi method to reach expert consensus on RTP criteria after HMI in professional football.

METHODS:

All professional football clubs in England (n=92) were invited to participate in a 3-round Delphi study. Round 1 requested a list of criteria used for RTP decisions after HMI. Responses were independently collated by 2 researchers under univocal definitions of RTP criteria. In round 2 participants rated their agreement for each RTP criterion on a 1-5 Likert Scale. In round 3 participants re-rated the criteria that had reached consensus in round 2. Descriptive statistics and Kendall's coefficient of concordance enabled interpretation of consensus.

RESULTS:

Participation rate was limited at 21.7% (n=20), while retention rate was high throughout the 3 rounds (90.0%, 85.0%, 90.0%). Round 1 identified 108 entries with varying definitions that were collated into a list of 14 RTP criteria. Rounds 2 and 3 identified 13 and 12 criteria reaching consensus, respectively. Five domains of RTP assessment were identified: functional performance, strength, flexibility, pain and player's confidence. The highest-rated criteria were in the functional performance domain, with particular importance given to sprint ability.

CONCLUSION:

This study defined a list of consensually agreed RTP criteria for HMI in professional football. Further work is now required to determine the validity of the identified criteria.

Previous injury

Br J Sports Med. 2017 Aug 7. pii: bjsports-2017-097500. doi: 10.1136/bjsports-2017-097500.

Is subsequent lower limb injury associated with previous injury? A systematic review and meta-analysis.

Toohey LA^{1,2,3}, Drew MK^{2,3}, Cook JL^{1,3}, Finch CF^{1,3}, Gaida JE^{4,5}.

BACKGROUND:

Previous injury is a strong risk factor for recurrent lower limb injury in athletic populations, yet the association between previous injury and a subsequent injury different in nature or location is rarely considered.

OBJECTIVE:

To systematically review data on the risk of sustaining a subsequent lower limb injury different in nature or location following a previous injury.

METHODS:

Eight medical databases were searched. Studies were eligible if they reported lower limb injury occurrence following any injury of a different anatomical site and/or of a different nature, assessed injury risk, contained athletic human participants and were written in English. Two reviewers independently applied the eligibility criteria and performed the risk of bias assessment. Meta-analysis was conducted using a random effects model.

RESULTS:

Twelve studies satisfied the eligibility criteria. Previous history of an ACL injury was associated with an increased risk of subsequent hamstring injury (three studies, RR=2.25, 95% CI 1.34 to 3.76), but a history of chronic groin injury was not associated with subsequent hamstring injury (three studies, RR=1.14, 95% CI 0.29 to 4.51). Previous lower limb muscular injury was associated with an increased risk of sustaining a lower limb muscular injury at a different site. A history of concussion and a variety of joint injuries were associated with an increased subsequent lower limb injury risk.

CONCLUSIONS:

The fact that previous injury of any type may increase the risk for a range of lower limb subsequent injuries must be considered in the development of future tertiary prevention programmes.

57. GAIT**Children shod and unshod****Foot strike pattern in children during shod-unshod running**

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Highlights

- Motor skills such as running and jumping are essential in most children's physical activities.
- In children, FSPs are influenced by shod/unshod conditions.
- RFS prevalence was similar between boys and girls.
- Barefoot running alters FSPs from an RFS to a MFS and FFS.
- Barefoot running causes alterations in foot rotation and INV/EVE.

Abstract

The purpose of this study was to determine the foot strike patterns (FSPs) and neutral support (no INV/EVE and no foot rotation) in children, as well as to determine the influence of shod/unshod conditions and sex.

A total of 713 children, aged 6 to 16 years, participated in this study (Age = 10.28 ± 2.71 years, body mass index [BMI] = 19.70 ± 3.91 kg/m², 302 girls and 411 boys). A sagittal and frontal-plane video (240 Hz) was recorded using a high-speed camcorder, to record the following variables: rearfoot strike (RFS), midfoot strike (MFS), forefoot strike (FFS), inversion/eversion (INV/EVE) and foot rotation on initial contact. RFS prevalence was similar between boys and girls in both shod and unshod conditions.

In the unshod condition there was a significant reduction ($p < 0.001$) of RFS prevalence both in boys (shod condition = 83.95% vs. 62.65% unshod condition) and in girls (shod condition = 87.85% vs. 62.70% unshod condition).

No significant differences were found in INV/EVE and foot rotation between sex groups. In the unshod condition there was a significant increase ($p < 0.001$) of neutral support (no INV/EVE) both in boys (shod condition = 12.55% vs. 22.22% unshod condition) and in girls (shod condition = 17.9% vs. 28.15% unshod condition).

In addition, in the unshod condition there is a significant reduction ($p < 0.001$) of neutral support (no foot rotation) both in boys (shod condition = 21.55% vs. 11.10% unshod condition) and in girls (shod condition = 21.05% vs. 11.95% unshod condition). In children, RFS prevalence is lower than adult's population. Additionally, barefoot running reduced the prevalence of RFS and INV/EVE, however increased foot rotation.

58. RUNNING**Asymmetries**

Scand J Med Sci Sports. 2017 Jul 31. doi: 10.1111/sms.12953.

Kinematic stride cycle asymmetry is not associated with sprint performance and injury prevalence in athletic sprinters.

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Author information

Abstract

The aims of this study were to (a) quantify the magnitude of kinematic stride cycle asymmetry in high-level athletic sprinters, (b) explore the association between kinematic asymmetry and maximal sprint running performance, and (c) investigate possible associations between kinematic asymmetry and injury prevalence.

Twenty-two competitive sprinters (age 23 ± 3 year, height 1.81 ± 0.06 m, body mass 75.5 ± 5.6 kg, personal best 100 m 10.86 ± 0.22 seconds) performed 2-3 flying sprints over 20 m. Kinematics were recorded in 3D using a motion tracking system with 21 cameras at a 250 Hz sampling rate, allowing assessment of six consecutive steps for each athlete. Information about injuries sustained 1 year prior to and after the experiment was continuously registered (type, location, severity/duration, and time of year occurrence). The results showed that ≥ 11 of the 22 participating athletes displayed large or very large asymmetry for at least 11 of 14 variables, and all athletes displayed large or very large asymmetry for at least three variables.

No correlations between individual magnitudes of asymmetry and sprint performance were significant (trivial to moderate). No significant changes in asymmetry between best and worst trial were observed for any of the analyzed variables. In addition, injured and non-injured athletes did not differ in asymmetry, neither for the time period 1 year prior to nor after the test. In conclusion, kinematic asymmetries in the stride cycle were not associated with neither maximal sprint running performance nor the prevalence of injury among high-level athletic sprinters.

59. PAIN**Pain and body perception**

J Pain Res. 2017 Jul 17;10:1667-1675. doi: 10.2147/JPR.S133425. eCollection 2017.

Dissatisfaction with own body makes patients with eating disorders more sensitive to pain.

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Author information

Abstract

Body image represents a multidimensional concept including body image evaluation and perception of body appearance.

Disturbances of body image perception are considered to be one of the central aspects of anorexia nervosa and bulimia nervosa. There is growing evidence that body image distortion can be associated with changes in pain perception. The aim of our study was to examine the associations between body image perception, body dissatisfaction, and nociception in women with eating disorders and age-matched healthy control women. We measured body dissatisfaction and pain sensitivity in 61 patients with *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition* diagnoses of eating disorders (31 anorexia nervosa and 30 bulimia nervosa) and in 30 healthy women. Thermal pain threshold latencies were evaluated using an analgesia meter and body image perception and body dissatisfaction were assessed using Anamorphic Micro software (digital pictures of their own body distorted into larger-body and thinner-body images). Patients with eating disorders overestimated their body size in comparison with healthy controls, but the two groups did not differ in body dissatisfaction. In anorexia and bulimia patient groups, body dissatisfaction (calculated in pixels as desired size/true image size) correlated with pain threshold latencies ($r=0.55$, $p=0.001$), while between body image perception (determined as estimation size/true image size) and pain threshold, no correlation was found.

Thus, we demonstrated that in patients with eating disorders, pain perception is significantly associated with emotional contrary to sensory (visual) processing of one's own body image. The more the patients desired to be thin, the more pain-sensitive they were.

Our findings based on some shared mechanisms of body dissatisfaction and pain perception support the significance of negative emotions specific for eating disorders and contribute to better understanding of the psychosomatic characteristics of this spectrum of illnesses

62 A. NUTRITION/VITAMINS**Stress and CA**

J Epidemiol Community Health. 2017 Aug 8. pii: jech-2016-208706. doi: 10.1136/jech-2016-208706.

Stress resilience and cancer risk: a nationwide cohort study.

Kennedy B¹, Fang F², Valdimarsdóttir U^{2,3,4}, Udumyan R¹, Montgomery S^{1,5,6}, Fall K^{1,2}.

BACKGROUND:

Stress resilience is recognised as a determinant of both psychiatric and somatic health, but the potential link between stress resilience and cancer development has not been explored.

METHODS:

In this nationwide cohort study, we examined the association between stress resilience in adolescence and subsequent cancer risk. We identified a cohort of 284 257 Swedish men, born 1952-1956, who underwent compulsory military enlistment examinations including measures of psychological stress resilience (median age 18 years). The resulting score was categorised as low, moderate and high stress resilience. Individuals diagnosed with cancer during the follow-up time were identified through data linkage to the Swedish Cancer Register.

RESULTS:

Lowest stress resilience, compared with the highest, was associated with increased risks of liver (HR: 4.73, 95% CI 2.73 to 8.19) and lung (HR: 2.75, 95% CI 2.02 to 3.74) cancer after adjusting for markers of socioeconomic circumstances in childhood (p for trend <0.001 for both cancer types). Further adjustment for cognitive and physical fitness at conscription assessment had a marginal influence. In contrast, men with low stress resilience had a decreased risk of being diagnosed with prostate cancer (HR: 0.65, 95% CI 0.56 to 0.76) and malignant melanoma (HR: 0.65, 95% CI 0.55 to 0.76).

CONCLUSION:

We conclude that adolescent stress resilience, plausibly by influencing behavioural choices and social patterns, constitutes an important determinant of adult cancer occurrence. Increased awareness of long-term consequences in susceptible individuals may help direct future efforts to reduce cancer burden in adults.

Cinnamon helps blood lipids**The Effects of Cinnamon Supplementation on blood Lipid Concentrations: A Systematic Review and Meta-Analysis**

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Alexandru Serban Peter Penson Maciej Banach

DOI: <http://dx.doi.org/10.1016/j.jacl.2017.08.004>

Highlights

- Cinnamon supplementation reduced total plasma cholesterol and triglycerides.
- Effect is correlated with duration of treatment, but not with dose administered.
- HDL was also significantly increased after removing one study from the analysis.

Abstract**Background**

Cinnamon is a rich botanical source of polyphenols, whose positive effects on blood lipid concentrations have been hypothesized, but have not been conclusively studied.

Objective

To systematically review and evaluate the effect of administration of cinnamon on blood lipid concentrations.

Methods

We assessed 13 RCTs with 750 participants investigating the effect of cinnamon supplementation on blood lipid concentrations. A meta-analysis was performed using random-effect models, with weighted mean differences (with 95% CI) for endpoints calculated using a random-effects model.

Results

No statistically significant effect of cinnamon was observed on blood LDL-C (WMD: -0.16 mmol/L [-6.19 mg/dL], 95% CI: -0.35, 0.03 [-13.53, 1.16], $p = 0.10$) and HDL-C (WMD: 0.05 mmol/L [1.92 mg/dL], 95% CI: -0.03, 0.12 [-0.03, 4.64], $p = 0.21$) concentrations. However, a statistically significant reduction in blood triglycerides (WMD: -0.27 mmol/L [-23.91 mg/dL], 95% CI: -0.39, -0.14 [-34.54, -12.40], $p < 0.01$) and total cholesterol concentrations (WMD: -0.36 mmol/L [-13.92 mg/dL], 95% CI: -0.63, -0.09 [-24.36, -3.48], $p < 0.01$) was observed. HDL-C was significantly elevated following the omission of one study (WMD: 0.04 mmol/L [1.54 mg/dL], 95% CI: 0.03, 0.06 [1.16, 2.32], $p < 0.01$) during our sensitivity analysis. A meta-regression analysis was conducted and no significant association was found between changes in lipid parameters and cinnamon dose. In contrast, changes in blood levels of total cholesterol (slope: 0.09; 95% CI: 0.02, 0.16; $p < 0.01$), LDL-C (slope: 0.05; 95% CI: 0.001, 0.10; $p = 0.05$) and triglycerides (slope: 0.06; 95% CI: 0.04, 0.09; $p < 0.01$) were significantly and positively associated with the duration of supplementation. No statistically significant association was found between blood HDL-C changes and duration of supplementation.

Conclusion

Cinnamon supplementation significantly reduced blood triglycerides and total cholesterol concentrations without any significant effect on LDL-C and HDL-C.

Extra virgin olive oil helps

Eur J Nutr. 2017 Aug 14. doi: 10.1007/s00394-017-1517-9.

Consumption of extra virgin olive oil improves body composition and blood pressure in women with excess body fat: a randomized, double-blinded, placebo-controlled clinical trial.

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Author information

Abstract

PURPOSE:

Despite the fact that extra virgin olive oil (EVOO) is widely used in obese individuals to treat cardiovascular diseases, the role of EVOO on weight/fat reduction remains unclear. We investigated the effects of energy-restricted diet containing EVOO on body composition and metabolic disruptions related to obesity.

METHODS:

This is a randomized, double-blinded, placebo-controlled clinical trial in which 41 adult women with excess body fat (mean \pm SD 27.0 \pm 0.9 year old, 46.8 \pm 0.6% of total body fat) received daily high-fat breakfasts containing 25 mL of soybean oil (control group, n = 20) or EVOO (EVOO group, n = 21) during nine consecutive weeks. Breakfasts were part of an energy-restricted normal-fat diets (-2090 kJ, ~32%E from fat). Anthropometric and dual-energy X-ray absorptiometry were assessed, and fasting blood was collected on the first and last day of the experiment.

RESULTS:

Fat loss was ~80% higher on EVOO compared to the control group (mean \pm SE: -2.4 \pm 0.3 kg vs. -1.3 \pm 0.4 kg, P = 0.037). EVOO also reduced diastolic blood pressure when compared to control (-5.1 \pm 1.6 mmHg vs. +0.3 \pm 1.2 mmHg, P = 0.011). Within-group differences (P < 0.050) were observed for HDL-c (-2.9 \pm 1.2 mmol/L) and IL-10 (+0.9 \pm 0.1 pg/mL) in control group, and for serum creatinine (+0.04 \pm 0.01 μ mol/L) and alkaline phosphatase (-3.3 \pm 1.8 IU/L) in the EVOO group. There was also a trend for IL-1 β EVOO reduction (-0.3 \pm 0.1 pg/mL, P = 0.060).

CONCLUSION:

EVOO consumption reduced body fat and improved blood pressure. Our results indicate that EVOO should be included into energy-restricted programs for obesity treatment.

Garlic extract helps hypertension

Integr Blood Press Control. 2016 Jan 27;9:9-21. doi: 10.2147/IBPC.S93335. eCollection 2016.

The effect of aged garlic extract on blood pressure and other cardiovascular risk factors in uncontrolled hypertensives: the AGE at Heart trial.

Ried K¹, Travica N², Sali A².

BACKGROUND:

Hypertension affects 30% of adults worldwide. Garlic supplements have shown promise in the treatment of uncontrolled hypertension, and the mechanism of action is biologically plausible. Our trial is the first to assess the effect of aged garlic extract on central blood pressure and arterial stiffness, regarded as important risk factors for cardiovascular morbidity.

SUBJECTS AND METHODS:

A total of 88 general practice patients and community members with uncontrolled hypertension completed a double-blind randomized placebo-controlled trial of 12 weeks investigating the effect of daily intake of aged garlic extract (1.2 g containing 1.2 mg S-allylcysteine) or placebo on blood pressure, and secondary outcome measures of central-hemodynamics and other cardiovascular markers, including cholesterol, homocysteine, platelet function, and inflammatory markers.

RESULTS:

Mean blood pressure was significantly reduced by 5.0±2.1 mmHg (P=0.016) systolic, and in responders by 11.5±1.9 mmHg systolic and 6.3±1.1 mmHg diastolic compared to placebo (P<0.001). Central hemodynamic-measures tended to improve in the garlic group more than in the placebo group, including central blood pressure, central pulse pressure, mean arterial pressure, augmentation pressure, pulse-wave velocity, and arterial stiffness. While changes in other cardiovascular markers did not reach significance due to small numbers in subgroups with elevated levels, trends in beneficial effects of garlic on the inflammatory markers TNF α , total cholesterol, low-density lipid cholesterol, and apolipoproteins were observed. Aged garlic extract was highly tolerable and acceptable, and did not increase the risk of bleeding in patients on blood-thinning medication.

CONCLUSION:

Our trial suggests that aged garlic extract is effective in reducing peripheral and central blood pressure in a large proportion of patients with uncontrolled hypertension, and has the potential to improve arterial stiffness, inflammation, and other cardiovascular markers in patients with elevated levels. Aged garlic extract was highly tolerable with a high safety profile as a stand-alone or adjunctive antihypertensive treatment.