

April 2012 Abstracts

I include some nutritional information important for PT's. The following comes from Alternatives written by Dr. David Williams.

Fructose

There have been books written on the dangers of chemical additives, but rarely on the sweetener fructose (often referred to as high fructose corn syrup), which is undoubtedly one of the most dangerous items

in our food supply right now. In 1966, refined sugar (sucrose) was the number-one sweetener in soft drinks, sweets, and foods. It accounted for 86% of all sweeteners used. There was no high fructose corn syrup. Since that time, high fructose corn syrup consumption has gone from zero to an estimated 63.8 pounds annually per person in 2000. (*The Agriculture Fact Book 2001–2002; Chapter 2, Profiling Food Consumption in America*)

Most people don't realize that fructose is addictive. Food processors have added fructose to more and more foods knowing it triggers an increase in sales. Out of the five tastes we perceive, sweet is the strongest and can override any of the others, as well as mask signs we would normally recognize as being rancid or toxic.

At higher levels, fructose is also a toxin. It's true that a lot of compounds are toxic. Even certain vitamins like D and A can be toxic if taken at high dosages for extended periods of time. The difference is they aren't being overused or abused like fructose. We're definitely not being overdosed with these vitamins from our foods or through normal supplementation. The story is different with fructose.

Fructose has been implicated in numerous inflammatory disease processes including eczema, psoriasis, arthritis, gout, ADHD, Alzheimer's, high blood pressure, type 2 diabetes, fatty liver disease, and autoimmune diseases like rheumatoid arthritis, thyroiditis, systemic lupus erythematosus, and insulin-dependent diabetes.

High fructose corn syrup has become the sweetener of choice because government subsidies for corn, and production quotas and import tariffs on sugar, have made it less expensive. It can also be made to be sweeter than sugar and is easier to transport since it's a liquid.

Fructose is absorbed differently from glucose in the intestinal tract. Glucose stimulates the release of insulin from the pancreas. Fructose doesn't. Instead of insulin, cells use glut-5 transporter to move fructose into cells. Most cells only have very limited amounts of this transporter, so it's primarily cleared by the liver, where it's easily transformed either into fat or components that eventually increase blood lipids like triglycerides.

Insomnia

In all cases of insomnia (and even if you don't have insomnia), make sure you sleep in almost complete darkness. While the invention of the light bulb has undoubtedly changed our world for the better, no one seems to mention that it has probably been one of the primary contributing factors to our widespread insomnia problems.

Begin limiting your exposure to bright lights a couple of hours before bedtime. Our lifestyle/habits can make this a challenge, but our bodies are designed to function best this way. We can temporarily adapt to changes and interruptions in this daylight/nighttime cycle, but constantly going against this natural rhythm will get us into trouble.

One very interesting animal study was reported in 2010. It showed that using very low-level light at night to prevent the natural daily resetting of the biological clock resulted in significant weight gain. This occurred even though those who were exposed to evening light consumed the same number of calories as those kept on a normal day/night cycle. The researchers believe the extra light disrupted melatonin ("sleep hormone") levels, which lowered metabolism in these animals. They also showed impaired glucose tolerance, which is a sign or marker of pre-diabetes. (PNAS *10;107(4):18664-18669*)

The secretion of melatonin starts around 9:00 PM and continues to about 7:00 or 7:30 AM, depending on when the sun rises. But melatonin is not just a sleep hormone. As I've reported in the past, it's one of the body's most powerful cancer fighters. And, turning on a bright light in the middle of the night is the quickest way to shut off the production of melatonin. Nightshift workers have repeatedly been found to have increased rates of cancer associated with lower melatonin levels.

Headaches

Headache and adverse pregnancy outcomes: a prospective study □ *European Journal of Obstetrics & Gynecology and Reproductive Biology* , 03/28/2012

Marozio L et al. – Women with headache should be considered at risk for adverse perinatal outcomes and should, therefore, be included in a high-risk pregnancy protocol of care throughout pregnancy.

Methods

- Prospective cohort study conducted in three tertiary care centres in Italy: 376 pregnant women suffering from headache and 326 non-headache pregnant women as controls were recruited.
- The diagnosis of headache was made at the beginning of pregnancy, according to the criteria of the International Classification of Headache Disorders (ICHD-II).
- Women were followed up until delivery, and gestational age at delivery, mode of delivery, indications for operative delivery or caesarean section, birth weight, and centile of neonatal weight at birth were carefully recorded.
- Main outcome measures of the study were: preterm delivery, newborns small for gestational age, and foetal losses.
- Odds ratios and 95% confidence intervals were calculated.

Results

- The incidence of preterm delivery (Adj OR, 95% CI 2.74, 1.27–5.91) was significantly higher in women suffering from headache than in controls.
- There was no statistically significant difference in small for gestational age newborns between the groups.
- Fewer women in the headache group had preterm elective caesarean section or induction of labour, than did controls, indicating a higher chance of spontaneous preterm delivery.

Multivariate analysis showed that the association between headache, either migraine or tension-type, and adverse perinatal outcomes was statistically significant regardless of pre-eclampsia.

Chronic Pain

Psychological symptoms in children of parents with chronic pain-the HUNT study □ Pain, 03/28/2012

Kaasboll J et al. – The results suggest that the presence of both maternal and paternal chronic pain is a high risk factor for internalizing symptoms in both girls and boys. The present study offers insights that should prove useful in clinical work and further large-scale research.

Methods

- The current study was based on cross-sectional surveys performed during 2006 to 2008 from the Nord Trondelag Health Study (HUNT 3 and Young-HUNT 3).
- The sample consisted of 3227 adolescents aged 13 to 18 years for whom information was available on parental chronic pain and health statuses.
- Separate analyses were conducted for girls and boys.

Results

- The results indicated that if both parents experienced chronic pain, there was an increased risk of symptoms of anxiety and depression in girls (OR=2.17, CI=1.36–3.45, P=.001) and boys (OR=2.33, CI=1.17–4.63, P=.016) compared with children for whom neither parent had chronic pain.
- Girls had an increased risk of conduct problems in school if their mothers had chronic pain (OR=1.33, CI=1.02–1.74, P=.034).

These results remained after adjusting for the possible effects of confounding factors and parental mental health.

HA/Bowel

The bowel and migraine: update on celiac disease and irritable bowel syndrome □ **Current Pain and Headache Reports, 03/28/2012**

Cady RK et al. – While this sensitizing response is generally considered to reside in the central nervous system, it may be possible that the initiation resides in the enteric nervous system as well. What appears to link migraine, irritable bowel syndrome (IBS), and celiac disease (CD) is a disease model of a genetically sensitive nervous system transformed into one that is hypervigilant, and that over time can often develop disabling and pervasive disease.

This article explores possible relationships between migraine, irritable bowel syndrome (IBS), celiac disease (CD), and gluten sensitivity. These seemingly distinct medical entities curiously share many common epidemiological, psychosocial, and pathophysiological similarities. Considerable evidence is emerging to support a concept that experiencing significant threatening adverse events creates a state of hypervigilance in the nervous system, which associates with exaggerated response to future threats and episodic attacks of migraine and IBS. While this sensitizing response is generally considered to reside in the central nervous system, it may be possible that the initiation resides in the enteric nervous system as well. What appears to link migraine, IBS, and CD is a disease model of a genetically sensitive nervous system transformed into one that is hypervigilant, and that over time can often develop disabling and pervasive disease.

LBP

Diagnosis of the vertebral level from which low back or leg pain originates. a comparison of clinical evaluation, MRI and epiduroscopy □Pain Practice, 03/27/2012

Bosscher HA et al. – Results of this study indicate that epiduroscopy is more reliable than is either clinical evaluation or MRI for determining the vertebral level where clinically significant spinal pathology occurs in patients with low back pain and/or pain radiating (LBP/RP).

Methods

- Observational cohort study of 143 patients 19 to 88 years of age undergoing spinal canal endoscopy (epiduroscopy) in a combined academic and private practice setting January 2008 to December 2008.
- Patients were asked whether pain generated by pressure upon epidural structures with the tip of an endoscope was similar in character and distribution (concordant) to the pain for which patients sought treatment.
- Notes from clinical evaluation and MRI reports were reviewed, and segmental level determined to be the locus of pathology was tabulated.

Results

- One hundred twenty-five (87%) patients reported maximal reproducible pain at a specific level during epiduroscopy.
- The most common level was at L4 to L5 (87 patients).
- The least common level was L5 to S1 (2 patients).
- In only 40 patients did the level determined by clinical evaluation correlate with the level at which pain could be reproduced during epiduroscopy.
- MRI indicated a specific vertebral level that corresponded to the level at which pain could be reproduced during epiduroscopy in 28 of 143 (20%) patients.

The results of the 3 diagnostic methods were significantly different ($P < 0.01$).

Pain

Feeling others painful actions: The sensorimotor integration of pain and action information

□ **Human Brain Mapping, 03/27/2012**

Morrison I et al. – Somatosensory cortices, including primary somatosensory areas 1/3b and 2 and parietal area PF, may therefore subserve somatomotor simulation processes by integrating action and object information to anticipate the sensory consequences of observed hand–object interactions.

Sensorimotor regions of the brain have been implicated in simulation processes such as action understanding and empathy, but their functional role in these processes remains unspecified. We used functional magnetic resonance imaging (fMRI) to demonstrate that postcentral sensorimotor cortex integrates action and object information to derive the sensory outcomes of observed hand–object interactions. When subjects viewed others' hands grasping or withdrawing from objects that were either painful or nonpainful, distinct sensorimotor subregions emerged as showing preferential responses to different aspects of the stimuli: object information (noxious vs. innocuous), action information (grasps vs. withdrawals), and painful action outcomes (painful grasps vs. all other conditions). Activation in the latter region correlated with subjects' ratings of how painful each object would be to touch and their previous experience with the object. Viewing others' painful grasps also biased behavioral responses to actual tactile stimulation, a novel effect not seen for auditory control stimuli. Somatosensory cortices, including primary somatosensory areas 1/3b and 2 and parietal area PF, may therefore subserve somatomotor simulation processes by integrating action and object information to anticipate the sensory consequences of observed hand–object interactions. *Hum Brain Mapp*, 2012. © 2012 Wiley Periodicals, Inc.

Pain

Brain activity during sympathetic response in anticipation and experience of pain □ **Human Brain Mapping, 03/27/2012**

Seifert F et al. – A conjunction analysis revealed a common central sympathetic network for (i) pain experience and (ii) pain anticipation with similar correlations between brain activity and sympathetic parameters in the anterior insula, prefrontal cortex, thalamus, midbrain, and temporoparietal junction. Therefore, the authors here describe shared central neural networks involved in the central autonomic processing of the experience and anticipation of pain.

Pain is a multidimensional phenomenon with sensory, affective, and autonomic components. Here, we used parametric functional magnetic resonance imaging (fMRI) to correlate regional brain activity with autonomic responses to (i) painful stimuli and to (ii) anticipation of pain. The autonomic parameters used for correlation were (i) skin blood flow (SBF) and (ii) skin conductance response (SCR). During (i) experience of pain and (ii) anticipation of pain, activity in the insular cortex, anterior cingulate cortex (ACC), prefrontal cortex (PFC), posterior parietal cortex (PPC), secondary somatosensory cortex (S2), thalamus, and midbrain correlated with sympathetic outflow. A conjunction analysis revealed a common central sympathetic network for (i) pain experience and (ii) pain anticipation with similar correlations between brain activity and sympathetic parameters in the anterior insula, prefrontal cortex, thalamus, midbrain, and temporoparietal junction. Therefore, we here describe shared central neural networks involved in the central autonomic processing of the experience and anticipation of pain. Hum Brain Mapp, 2012. © 2012 Wiley Periodicals, Inc.

Anti-inflammatory medications

Non-steroidal anti-inflammatory drugs for the treatment of pain and immobility-associated osteoarthritis: consensus guidance for primary care *Full Text* □ BMC Family Practice, 03/26/2012

Adebajo A – Individual patient risk is an important factor in choice of treatment for patients with osteoarthritis and the consensus statement developed offers practical guidance for GPs and others in primary care. Where there are clinical uncertainties, guidance developed and agreed by local clinicians has a role to play in improving patient management.

Methods

- A multi-disciplinary group that included primary care professionals (PCPs) developed an evidence-based consensus statement with an accompanying flowchart that aimed at providing concise and specific guidance on NSAID use in osteoarthritis treatment.
- An open invitation to meet and discuss the issue was made to relevant healthcare professionals in South Yorkshire.
- A round table meeting was held that used a modified nominal group technique, aimed at generating opinions and ideas from all stakeholders in the consensus process.
- A draft developed from this meeting went through successive revisions until a consensus was achieved.

Results

- Four statements on the use of tNSAIDs and COX-2 inhibitors (and an attached category of evidence) were agreed:
 - 1) tNSAIDs are effective drugs in relieving pain and immobility associated with osteoarthritis. COX-2 inhibitors are equally effective;
 - 2) tNSAIDs and COX-2 inhibitors vary in their potential gastrointestinal, liver, and cardio-renal toxicity. This risk varies between individual treatments within both groups and is increased with dose and duration of treatment;
 - 3) COX-2 inhibitors are associated with a significantly lower gastrointestinal toxicity compared to tNSAIDs. Co-prescribing of aspirin reduces this advantage;
 - 4) PPIs should always be considered with a tNSAID and with a COX-2 inhibitor in higher GI risk patients.
- An accompanying flowchart to guide management was also agreed.

LBP

Comparing lower lumbar kinematics in cyclists with low back pain (flexion pattern) versus asymptomatic controls—field study using a wireless posture monitoring system □ Manual Therapy , 03/29/2012

Van Hoof W et al. – These findings suggest that a subgroup of cyclists with NS–CLBP (FP) demonstrate an underlying maladaptive motor control pattern resulting in greater lower lumbar flexion during cycling which is related to a significant increase in pain.

- Eight cyclists with NS–CLBP classified as having a ‘Flexion Pattern’ (FP) disorder and nine age– and gender–matched asymptomatic cyclists were tested.
- Subjects performed a 2 h outdoor cycling task on their personal race bike.
- Lower lumbar kinematics was measured with the BodyGuard monitoring system.
- Pain intensity during and after cycling was measured using a numerical pain rating scale.
- The NS–CLBP (FP) subjects were significantly more flexed at the lower lumbar spine during cycling compared to healthy controls ($p = 0.018$), and reported a significant increase in pain over the 2 h of cycling ($p < 0.001$).
- One–way repeated measures ANOVA revealed a significant main effect for group ($p = 0.035$, $F = 5.546$) which remained just significant when adding saddle angle as a covariate ($p = 0.05$, $F = 4.747$).

The difference in posture between groups did not change over time.

The aim of this study was to examine lower lumbar kinematics in cyclists with and without non-specific chronic low back pain (NS-CLBP) during a cross-sectional cycling field study. Although LBP is a common problem among cyclists, studies investigating the causes of LBP during cycling are scarce and are mainly focussed on geometric bike-related variables. Until now no cycling field studies have investigated the relationship between maladaptive lumbar kinematics and LBP during cycling. Eight cyclists with NS-CLBP classified as having a ‘Flexion Pattern’ (FP) disorder and nine age- and gender-matched asymptomatic cyclists were tested. Subjects performed a 2 h outdoor cycling task on their personal race bike. Lower lumbar kinematics was measured with the BodyGuard™ monitoring system. Pain intensity during and after cycling was measured using a numerical pain rating scale. The NS-CLBP (FP) subjects were significantly more flexed at the lower lumbar spine during cycling compared to healthy controls ($p = 0.018$), and reported a significant increase in pain over the 2 h of cycling ($p < 0.001$). One-way repeated measures ANOVA revealed a significant main effect for group ($p = 0.035$, $F = 5.546$) which remained just significant when adding saddle angle as a covariate ($p = 0.05$, $F = 4.747$). The difference in posture between groups did not change over time. These findings suggest that a subgroup of cyclists with NS-CLBP (FP) demonstrate an underlying maladaptive motor control pattern resulting in greater lower lumbar flexion during cycling which is related to a significant increase in pain.

Manual Therapy

Volume 17, Issue 2, Pages 119-125, April 2012

Self-reported pain severity, quality of life, disability, anxiety and depression in patients classified with ‘nociceptive’, ‘peripheral neuropathic’ and ‘central sensitisation’ pain. The discriminant validity of mechanisms-based classifications of low back (\pm leg) pain

- [Keith M. Smart](#) , [Catherine Blake](#), [Anthony Staines](#), [Catherine Doody](#)

Evidence of validity is required to support the use of mechanisms-based classifications of pain clinically. The purpose of this study was to evaluate the discriminant validity of ‘nociceptive’ (NP), ‘peripheral neuropathic’ (PNP) and ‘central sensitisation’ (CSP) as mechanisms-based classifications of pain in patients with low back (\pm leg) pain by evaluating the extent to which patients classified in this way differ from one another according to health measures associated with various dimensions of pain.

This study employed a cross-sectional, between-subjects design. Four hundred and sixty-four patients with low back (\pm leg) pain were assessed using a standardised assessment protocol. Clinicians classified each patient’s pain using a mechanisms-based classification approach. Patients completed a number of self-report measures associated with pain severity, health-related quality of life, functional disability, anxiety and depression. Discriminant validity was evaluated using a multivariate analysis of variance.

There was a statistically significant difference between pain classifications on the combined self-report measures, ($p = .001$; Pillai’s Trace = .33; partial eta squared = .16). Patients classified with CSP ($n = 106$) reported significantly more severe pain, poorer general health-related quality of life, and greater levels of back pain-related disability, depression and anxiety compared to those classified with PNP ($n = 102$) and NP ($n = 256$). A similar pattern was found in patients with PNP compared to NP.

Mechanisms-based pain classifications may reflect meaningful differences in attributes underlying the multidimensionality of pain. Further studies are required to evaluate the construct and criterion validity of mechanisms-based classifications of musculoskeletal pain.

Efficacy of Multidisciplinary Treatment for Patients With Chronic Low Back Pain: A Prospective Clinical Study in 395 Patients □ *Journal of Clinical Rheumatology (JCR)*, 03/29/2012

Moradi B et al. – Multidisciplinary treatment ameliorates pain, functional restoration, and quality of life with medium to high effect sizes even for patients with a long history of chronic back pain. Effect sizes are higher than for monodisciplinary treatments and treatment effects remained stable at 6-month follow-up in a longitudinal uncontrolled study design. Thus, the authors believe that multidisciplinary treatment is vital for the treatment of patients with chronic low back pain. The impact of sociodemographic and pain-related parameters needs to be taken into account when including patients in an appropriate treatment program. They emphasize the presentation of effect sizes as a vital treatment evaluation to enable cross-sectional comparison of therapy outcomes.

Methods

- Data on 395 patients were prospectively collected at study entry, at the end of the program (T1) and after 6 months' follow-up (T2).
- Relevant therapy outcomes were analyzed by presenting effect sizes with Cohen's d. Group comparisons were performed for sociodemographic and clinical features to determine the impact on therapy outcome.

Results

- Medium effect sizes ($d = -0.6$ to -0.7) were shown for visual analog scale (VAS) after treatment and at T2, indicating clinically relevant pain relief.
- Significant changes in pain-related disability were observed immediately at T1 with a strong treatment effect ($d = 0.8$).
- Functional capacity was improved with low to medium effect sizes (0.4–0.5).
- Quality-of-life subscales (36-item Short Form Health Survey) improved significantly at T1 for physical function, vitality, and mental health ($d = 0.5$ –0.8).
- Center for Epidemiological Studies – Depression Scale scores improved significantly with strong effect sizes of $d = 0.7$.
- Sociodemographic parameters displayed a significant impact on effect sizes for visual analog scale at T2, with females ($d = -0.9$), age group 30 to 39 years ($d = -1$), and patients with low physical job exposure ($d = -0.9$) benefiting most.

An increase in number of pain locations (-0.7) and severity of accompanying pain (-0.7) in other body areas significantly impaired therapy outcome and effect sizes of VAS.

LBP

Multivariable analysis of the relationship between pain referral patterns and the source of chronic low back pain: retrospective review *Full Text* □ **Pain Physician, 03/29/2012**

Laplante BL et al. – The presence or absence of thigh pain possesses a significant correlation on the source of chronic low back pain (CLBP) for varying ages, whereas the presence of hip/girdle pain or leg pain did not significantly discriminate among IDD, FJP, or SIJP as the etiology of CLBP. Younger age was predictive of IDD regardless of the presence or absence of thigh pain.

Methods

- Charts of consecutive low back pain patients who underwent definitive diagnostic spinal procedures were retrospectively reviewed.
- Patients underwent provocation lumbar discography, dual diagnostic medial branch blocks, or intra-articular diagnostic sacroiliac joint injections based on clinical presentation.
- Some subjects underwent multiple diagnostic injections until the source of their chronic low back pain (CLBP) was identified.

Results

- The mean age was significantly different among the source groups.
- IDD cases were significantly younger than FJP, SIJP, and other source groups and FJP cases were significantly younger than other sources.

The age by thigh pain interaction effect was statistically significant ($P = 0.021$), indicating that the effect of age on the source of CLBP depends on thigh pain, and similarly, that the effect of thigh pain on the source of CLBP depends on age.

LBP

Man Ther. 2012 Mar 21. [Epub ahead of print]

Can a within/between-session change in pain during reassessment predict outcome using a manual therapy intervention in patients with mechanical low back pain?

Cook CE, Showalter C, Kabbaz V, O'Halloran B.

Source

Division of Physical Therapy, Walsh University, North Canton, OH 44720, USA.

Abstract

The purposes of the study were to determine whether the combined occurrence of within/between-session changes were significantly associated with functional outcomes, pain, and self-report of recovery in patients at discharge who were treated with manual therapy for low back pain. A secondary purpose was to determine the extent of change needed for the within/between-session change with association to function. The study involved 100 subjects who were part of a randomized controlled trial that examined manual therapy techniques who demonstrated a positive response to manual therapy during the initial assessment. Within- and between-session findings (within/between session) were defined as a change in pain report from baseline to after the second physiotherapy visit. Within/between-session changes were analyzed for associations between pain change scores at discharge, rate of recovery, and a 50% reduction of the Oswestry disability index (ODI) by discharge. The results suggest there is a significant association between a within/between-session change after the second physiotherapy visit and discharge outcomes for pain and ODI in this sample of patients who received a manual therapy intervention. A 2-point change or greater on an 11-point scale is associated with functional recovery at discharge and accurately described the outcome in 67% of the cases. This is the first study that has shown an association of within/between-session changes with disability scores at discharge and is the first to define the extent of change necessary for prognosis of an outcome. A within/between-session change should be considered as a complimentary artifact along with other examination findings during clinical decision making.

Copyright © 2012 Elsevier Ltd. All rights reserved.

Spondylothesis

Importance of Lumbosacral Kyphosis for Teens with Spondylolisthesis

The lives of children and teens with a condition known as *spondylolisthesis* can be negatively affected by the consequences of this problem. According to this study from Canada, spondylolisthesis in teens lowers their physical quality of life. They have back pain, tight hamstrings, and neurologic symptoms. The greater the angle of the lumbar vertebra on the sacrum, the higher the grade of spondylolisthesis and the lower the physical quality of life.

Normally, the bones of the spine (the vertebrae) stand neatly stacked on top of one another. Ligaments and joints support the spine. Spondylolisthesis alters the alignment of the spine. In this condition, one of the spine bones slips forward over the one below it. As the bone slips forward, the nearby tissues and nerves may become irritated and painful.

Any of the vertebrae can slip forward but in young people (under 20 years old), spondylolisthesis usually involves slippage of the fifth lumbar vertebra over the top of the sacrum. There are several reasons for this.

First, the connection of L5 and the sacrum forms an angle that is tilted slightly forward, mainly because the top of the sacrum slopes forward. This angle is referred to as the *lumbosacral kyphosis* or LSK. Second, the slight inward curve of the lumbar spine creates an additional forward tilt where L5 meets the sacrum. Finally, gravity attempts to pull L5 in a forward direction. All three of these bony alignments can be measured using X-rays.

In this study, 96 adolescents (teens) with spondylolisthesis were X-rayed using a digital radiographic system. Then they were given an opportunity to answer some questions in order to measure their physical quality of life. The slip angle, the lumbosacral angle, and the lumbosacral joint angle were all calculated using the X-rays. All X-rays were taken with the patients standing in a comfortable upright position.

Then scores from the health questionnaires were compared to each radiograph. They found a definite link between lumbosacral angles and quality of life. High-grade slippage (defined as more than 50 per cent of the vertebral body is slipped forward over the vertebra underneath it) was significantly linked with low quality of life.

The results of this study point out clearly (for the first time) how much a lumbosacral kyphosis impacts the lives of affected teens. The less contact there is between the surface of the L5 vertebra and the sacrum (S1), the greater the chances that individual will have changes the body can no longer compensate for.

For example, not only do the bones shift forward but when they shift that far forward, they can start to twist or rotate. This altered alignment can put increased pressure on the spinal nerves as they leave the spinal cord. The end-result can be severe deformity and neurologic impairment.

Physicians treating adolescents with spondylolisthesis are advised to routinely assess each child for the presence (and severity) of lumbosacral kyphosis. The three angles visible on radiographs are an important feature when determining the best plan of treatment for that patient.

Reference:

Frédéric Tanguay, MD, et al. Clinical Significance of Lumbosacral Kyphosis in Adolescent Spondylolisthesis. In *Spine*. February 15, 2012. Vol. 37. No. 4. Pp. 304-308.

LBP

Low Back and Hip Pain in a Postpartum Runner: Applying Ultrasound Imaging and Running Analysis

Jill M. Thein-Nissenbaum, Elizabeth F. Thompson, Elizabeth S. Chumanov, Bryan C. Heiderscheit

DOI: 10.2519/jospt.2012.3941

STUDY DESIGN: Case report. **BACKGROUND:** Postpartum low back and hip dysfunction may be caused by an incomplete recovery of abdominal musculature and impaired neuromuscular control. The purpose of this report is to describe the management of a postpartum runner with hip and low back pain (LBP) through exercise training via ultrasound imaging (USI) biofeedback combined with running form modification. **CASE DESCRIPTION:** A postpartum runner with hip and LBP underwent dynamic lumbar stabilization (DLS) training with USI biofeedback, and running form modification to reduce mechanical loading. Muscle thickness of transversus abdominus (TrA) and internal oblique (IO) was measured with USI pre-intervention and 7wks after completion of the intervention. Additionally, three-dimensional lower extremity joint motions, moments and powers were calculated during treadmill running. **OUTCOMES:** The patient's pain with running decreased from a constant 9/10 (0, no pain; 10, worst pain) to an occasional 3/10 post-treatment. TrA muscle thickness increased 6.3% during the abdominal drawing in maneuver (ADIM) and 27.0% during the ADIM with straight leg raise (SLR); changes were also noted in the IO. These findings corresponded to improved lumbopelvic control; pelvic list and axial rotation during running decreased 38% and 36%, respectively. The patient's running volume returned to pre-injury levels (8.1-9.7 km, 3 d/wk) with no hip pain and minimal LBP; she successfully completed her goal of running a half marathon. **DISCUSSION:** The successful outcomes of this case support the consideration of DLS exercises, USI biofeedback and running form modification in postpartum runners with lumbopelvic dysfunction. **LEVEL OF EVIDENCE:** Therapy, Level 4.

J Orthop Sports Phys Ther, Epub 23 March 2012. doi:10.2519/jospt.2012.3941

KEY WORDS: abdominal drawing in maneuver, running mechanics, transversus abdominus

The purpose of this report is to describe the management of a postpartum runner with hip and low back pain (LBP) through exercise training via ultrasound imaging (USI) biofeedback combined with running form modification.

LBP/Diaphragm

Postural Function of the Diaphragm in Persons With and Without Chronic Low Back Pain
Pavel Kolar, Jan Sulc, Martin Kyncl, Jan Sanda, Ondrej Cakrt, Ross Andel, Kathryn Kumagai,
Alena Kobesova

DOI: 10.2519/jospt.2012.3830

APRIL 2012 □ Volume 42, No4

STUDY DESIGN: A case-control study. **OBJECTIVES:** To examine the function of the diaphragm during postural limb activities in patients with chronic low back pain and healthy controls. **BACKGROUND:** Abnormal stabilizing function of the diaphragm may be an etiological factor in spinal disorders. However, a study designed specifically to test the dynamics of the diaphragm in chronic spinal disorders is lacking. **METHODS:** Eighteen patients with chronic low back pain due to chronic overloading, as ascertained via clinical assessment and magnetic resonance imaging, and 29 healthy subjects were examined. Both groups presented with normal pulmonary function test results. A dynamic magnetic resonance imaging system and specialized spirometric readings were used with subjects in the supine position. Measurements during tidal breathing (TB) and isometric flexion of the upper and lower extremities against external resistance with TB were performed. Standard pulmonary function tests, including respiratory muscle drive (P_Imax and P_Emax), were also assessed. **RESULTS:** Using multivariate analysis of covariance, smaller diaphragm excursions and higher diaphragm position were found in the patient group ($P < .05$) during the upper extremity TB and lower extremity TB conditions. Maximum changes were found in costal and middle points of the diaphragm. A 1-way analysis of covariance showed a steeper slope in the middle-posterior diaphragm in the patient group both in the upper extremity TB and lower extremity TB conditions ($P < .05$). **CONCLUSION:** Patients with chronic low back pain appear to have both abnormal position and a steeper slope of the diaphragm, which may contribute to the etiology of the disorder.

J Orthop Sports Phys Ther 2012;42(4):352-362, Epub 21 December 2011.

doi:10.2519/jospt.2012.3830

KEY WORDS: dynamic magnetic resonance imaging, lung function, spinal disorders, stabilizing function, thorax

The authors examine the function of the diaphragm during postural limb activities in patients with chronic low back pain and healthy controls.

Gait

Eur Spine J. 2012 Mar 29. [Epub ahead of print]

Factors affecting shoulder-pelvic integration during axial trunk rotation in subjects with recurrent low back pain.

Park WH, Kim YH, Lee TR, Sung PS.

Source

Department of Physical Therapy, Korea University, #1 Jeongneung 3-dong, Sungbuk-gu, Seoul, 136-703, Republic of Korea.

Abstract

INTRODUCTION:

Shoulder-pelvic integration could play a central role in the control of dynamic posture and movement. However, kinematic coordination during axial trunk rotation has not been carefully investigated in subjects with recurrent low back pain (LBP). The purpose of this study was to compare the maximum rotational angles of the shoulders and pelvis in the transverse plane between subjects with and without recurrent LBP.

MATERIALS AND METHODS:

A total of 38 age-matched subjects (19 control subjects: 69.00 ± 5.75 years old and 19 subjects with LBP: 68.79 ± 5.40 years old) participated in the study. The axial trunk rotation test was conducted in the upright position with bilateral hips and knees fully extended and both feet shoulder width apart.

RESULTS:

The results of this study indicated that there was a difference in pelvic girdle rotation between groups (100.79 ± 26.46 in the control group, 82.12 ± 23.16 in the LBP group; $t = 2.31$, $p = 0.02$); however, there was no difference for the shoulder girdle (177.63 ± 36.98 in the control group, 156.42 ± 30.09 in the LBP group; $t = 1.91$, $p = 0.06$). There were interactions with age ($F = 9.27$, $p = 0.004$) and BMI ($F = 7.50$, $p = 0.01$) with the rotational angles of the shoulder and pelvis.

CONCLUSION:

These results indicated a different pattern of trunk rotation movement with the age and BMI serving as important factors to consider for recurrent LBP. The results of our study also indicated a different pattern of shoulder and pelvic coordination with age and gender. Clinicians need to consider the consequences of limited shoulder-pelvic rotational angles, especially limited rotational angle on the pelvis during trunk axial rotation. Further studies are required to determine the causes of the underlying problems for clinical decision-making and altered shoulder-pelvic rotation in subjects with recurrent LBP

Gait

J Neurosci Nurs. 2011 Dec;43(6):298-307.

The effects of exercise-based rehabilitation on balance and gait for stroke patients: a systematic review.

An M, Shaughnessy M.

Source

University of Maryland School of Nursing, Baltimore, MD, USA. man001@umaryland.edu

Abstract

This review evaluated the effects of balance and/or gait exercise interventions for stroke survivors and summarized the available evidence on these exercise interventions. A search for studies published between January 2001 and January 2010 was performed using the keywords stroke, walking or balance, and physical activity or exercise. Seventeen randomized clinical trials were identified. The findings suggest that initiating early rehabilitation during acute to subacute stroke recovery can improve balance and walking capacity. The findings also demonstrate that at least 1 hour, three to five times per week, of balance training and 30 minutes, three to five times per week, of gait-oriented exercise are effective to improve balance and walking. This review confirms that balance and walking capacity are improved with specific exercise modalities. A combination of balance, gait, and aerobic exercises would be ideal.

PMID: 22089406 [PubMed - indexed for MEDLINE]

LBP

Clin Rehabil. 2011 Nov;25(11):999-1010. Epub 2011 Aug 10.

A randomized controlled trial of the effects of muscle stretching, manual therapy and steroid injections in addition to 'stay active' care on health-related quality of life in acute or subacute low back pain.

Grunnesjö MI, Bogefeldt JP, Blomberg SI, Strender LE, Svärdsudd KF.

Source

Uppsala University, Department of Public Health and Caring Sciences, Family Medicine Section, Uppsala, Sweden. marie.grunnesjo@pubcare.uu.se

Abstract

OBJECTIVE:

To evaluate the health-related quality of life effects of muscle stretching, manual therapy and steroid injections in addition to 'stay active' care in acute or subacute low back pain patients.

STUDY DESIGN:

A randomized, controlled trial during 10 weeks with four treatment groups.

SETTING:

Nine primary health care and one outpatient orthopaedic hospital department.

SUBJECTS:

One hundred and sixty patients with acute or subacute low back pain.

INTERVENTIONS:

Ten weeks of 'stay active' care only (group 1), or 'stay active' and muscle stretching (group 2), or 'stay active', muscle stretching and manual therapy (group 3), or 'stay active', muscle stretching, manual therapy and steroid injections (group 4).

MAIN MEASURES:

The Gothenburg Quality of Life instrument subscales Well-being score and Complaint score.

RESULTS:

In a multivariate analysis adjusted for possible outcome affecting variables other than the treatment given Well-being score was 68.4 (12.5), 72.1 (12.4), 72,3 (12.4) and 72.7 (12.5) in groups 1-4, respectively (P for trend <0.05). There were significant trends for the well-being components patience (P < 0.005), energy (P < 0.05), mood (P < 0.05) and family situation (P < 0.05). The remaining two components and Complaint score showed a non-significant trend towards improvement.

CONCLUSION:

The effects on health-related quality of life were greater the larger the number of treatment modalities available. The 'stay active' treatment group, with the most restricted number of modalities, had the most modest health-related quality of life improvement, while group 4 with the most generous choice of treatment modalities, had the greatest improvement.

Vertebra

Eur Spine J. 2012 Mar 25. [Epub ahead of print]

Vertebral deformity arising from an accelerated "creep" mechanism.

Luo J, Pollintine P, Gomm E, Dolan P, Adams MA.

Source

University of Roehampton, London, UK, Jin.Luo@roehampton.ac.uk.

Abstract

INTRODUCTION:

Vertebral deformities often occur in patients who recall no trauma, and display no evident fracture on radiographs. We hypothesise that vertebral deformity can occur by a gradual creep mechanism which is accelerated following minor damage. "Creep" is continuous deformation under constant load.

MATERIALS AND METHODS:

Forty-five thoracolumbar spine motion segments were tested from cadavers aged 42-92 years. Vertebral body areal BMD was measured using DXA. Specimens were compressed at 1 kN for 30 min, while creep in each vertebral body was measured using an optical MacReflex system. After 30 min recovery, each specimen was subjected to a controlled overload event which caused minor damage to one of its vertebrae. The creep test was then repeated.

RESULTS:

Vertebral body creep was measurable in specimens with BMD $<0.5 \text{ g/cm}^2$. Creep was greater anteriorly than posteriorly ($p < 0.001$), so that vertebrae gradually developed a wedge deformity. Compressive overload reduced specimen height by 2.24 mm (STD 0.77 mm), and increased vertebral body creep by 800 % (anteriorly), 1,000 % (centrally) and 600 % (posteriorly). In 34 vertebrae with complete before-and-after data, anterior wedging occurring during the 1st creep test averaged 0.07° (STD 0.17°), and in the 2nd test (after minor damage) it averaged 0.79° (STD 1.03°). The increase was highly significant ($P < 0.001$). Vertebral body wedging during the 2nd creep test was proportional to the severity of damage, as quantified by specimen height loss during the overload event ($r(2) = 0.51$, $p < 0.001$, $n = 34$).

CONCLUSIONS:

Minor damage to an old vertebral body, even if it is barely discernible on radiographs, can accelerate creep to such an extent that it makes a substantial contribution to vertebral deformity

Scapula

J Shoulder Elbow Surg. 2012 Mar 21. [Epub ahead of print]

Does scapular dyskinesis affect top rugby players during a game season?

Kawasaki T, Yamakawa J, Kaketa T, Kobayashi H, Kaneko K.

Source

Department of Orthopaedic Surgery, Juntendo University Faculty of Medicine, Bunkyo, Tokyo, Japan.

Abstract

BACKGROUND:

Scapular dyskinesis represents a considerable risk of shoulder injury to overhead athletes; however, there is a shortage of detailed epidemiologic information about scapular dyskinesis among the participants in collision sports.

PURPOSE:

To describe the incidence and relationship of scapular dyskinesis to shoulder discomfort and variables related to the shoulder in top rugby players.

METHODS:

One hundred twenty top rugby football players in Japan were evaluated by means of questionnaires, physical examinations, and a video analysis during their preseason. Data were assessed by a logistic regression analysis calculating odds ratios. The primary outcome was processed to assess the relationship between scapular dyskinesis and other variables at the preseason. The secondary outcome was processed to assess an influence of scapular dyskinesis to shoulder discomfort during their regular season that were reassigned by second questionnaires.

RESULTS:

Scapular dyskinesis was identified in 33 (32%) shoulders, and type III was prominent. Scapular dyskinesis was significantly associated with shoulder discomfort (OR [odds ratio] = 4.4), and was also associated with variables of the affected shoulder. In addition, the players with asymptomatic scapular dyskinesis at the preseason would have high incident with shoulder discomfort during their regular season (OR = 3.6).

CONCLUSIONS:

Scapular dyskinesis was associated significantly with both subjective and objective symptoms of the affected shoulder. These appearances may be of particular relevance in the early screening of chronic shoulder disorders in the rugby population. Further study to investigate and evaluate its reliability is needed to characterize its impact on the participants in collision sports.

Copyright © 2012 Journal of Shoulder and Elbow Surgery Board of Trustees. Published by Mosby, Inc. All rights reserved

Pelvic Floor

Arch Phys Med Rehabil. 2012 Mar 22. [Epub ahead of print]

Exercise adherence to pelvic floor muscle strengthening is not a significant predictor of symptom reduction for women with urinary incontinence.

Hung HC, Chih SY, Lin HH, Tsauo JY.

Source

School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University; Department of Rehabilitation Science, Jen-The Junior College of Medicine, Nursing and Management.

Abstract

OBJECTIVE:

To explore the predictors of treatment effectiveness for women with urinary incontinence (UI) receiving pelvic floor muscle (PFM) strengthening.

DESIGN:

A four-month cohort study.

SETTING:

Laboratory.

PARTICIPANTS:

Sixty-eight volunteers (50.5±6 years old) with UI.

INTERVENTION:

Four-month daily PFM strengthening exercise program at home.

MAIN OUTCOME MEASURES:

Outcome measures included self-reported improvement, Severity Index score, 3-days diary, strength of PFM, and quality of life. The amount of exercise during 4 months was used to assess the exercise adherence from the participants' recall after 4-month exercise period.

RESULTS:

Seventy-five percent (51/68) of women reported their condition improved after 4-month exercise. There were significant reductions in Severity Index score, number of voiding per day, number of leakage per day, and impact on quality of life ($P<0.05$). Besides, the score of PFM strength was significantly improved ($P=0.001$). There was no significant correlations between the change score of Severity Index and age, BMI, parity, type of UI, duration of UI, menopausal status, and amount of exercise (all $P>0.1$). Multiple regression analysis revealed that initial severity of symptoms and improvement of PFM strength predicted 51.3% of variance in 4-month exercise effectiveness (change score of Severity Index).

CONCLUSIONS:

The effectiveness of 4-month PFM strengthening program was influenced by severity of symptom and improvement score of PFM strength instead of exercise adherence. Women who had more significant symptom of leakage (higher score of Severity Index at baseline) and who had more improvement of PFM strength showed more improvement of symptom after PFM strengthening.

Copyright © 2012 the American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved

LBP

Arch Phys Med Rehabil. 2012 Mar 21. [Epub ahead of print]

Standardized Measurement of Recovery From Nonspecific Back Pain.

Hush JM, Kamper SJ, Stanton TR, Ostelo R, Refshauge KM.

Source

Faculty of Human Sciences, Macquarie University, Sydney, Australia.

Abstract

Hush JM, Kamper SJ, Stanton TR, Ostelo R, Refshauge KM. Standardized measurement of recovery from nonspecific back pain.

OBJECTIVE:

To propose standardized, patient-centered measures of recovery from nonspecific low back pain (LBP) in research, underpinned by an empirically derived concept of recovery and informed by expert opinion.

DESIGN:

Synthesis of literature reviews and expert panel opinion.

SETTING:

Primary care centers for the management of nonspecific LBP.

PARTICIPANTS:

Persons with nonspecific LBP.

INTERVENTIONS:

Conservative treatments for nonspecific LBP.

MAIN OUTCOME MEASURES:

Three phases of research were conducted. First, qualitative research that explored patients' perspectives of recovery from nonspecific LBP was reviewed. Second, measures of recovery used in LBP clinical trials during the past decade were investigated in a systematic review. Third, opinion was sought from an expert panel of clinicians and researchers about how to measure recovery from nonspecific LBP, in a workshop at the 10th International Forum for Primary Care Research in Low Back Pain.

RESULTS:

An empirically derived and patient-centered concept of recovery from nonspecific LBP was developed from the qualitative research phase. The systematic review conducted in the second study phase revealed that researchers have used vastly heterogeneous measures of LBP recovery in clinical trials during the past decade. Finally, the key conclusions of the LBP Forum workshop were (1) that appropriate patient-centered instruments to measure recovery include global measures and patient-specific measures; and (2) that the benefits of implementing the same recovery measures for acute and chronic LBP outweigh the disadvantages of using different measures.

CONCLUSIONS:

The results were synthesized to inform our recommendation that researchers consider adopting 2 instruments as standardized measures of recovery from nonspecific LBP, as an adjunct to the existing core set of LBP outcome measures. These instruments are an 11-point Global Back Recovery Scale, for a simple measure of global recovery, and the Patient-Generated Index of Quality of Life-Back Pain, to evaluate specific relevant dimensions of recovery. This recommendation has majority endorsement by members of the Australian National Health and Medical Research Council Acute Low Back Pain Review Group.

Knee/Meniscus

Arthroscopy. 2012 Mar 20. [Epub ahead of print]

Medial Meniscus Tear Morphology and Chondral Degeneration of the Knee: Is There a Relationship?

Henry S, Mascarenhas R, Kowalchuk D, Forsythe B, Irrgang JJ, Harner CD.

Source

Department of Orthopaedic Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, U.S.A.

Abstract

PURPOSE:

The purpose of this study was to examine the association of medial meniscus tear morphology with the pathogenesis of articular cartilage degeneration.

METHODS:

From May 2006 to December 2007, we prospectively evaluated 103 patients diagnosed with an isolated medial meniscus tear. Meniscus tear morphology and location, cartilage degeneration according to the Noyes score, and covariates including age, body mass index, gender, and injury date were documented. The relationship between severity of articular cartilage degeneration and meniscus tear morphology was analyzed by analysis of variance. Regression analysis was used to analyze predictors of severity of cartilage lesions.

RESULTS:

Analysis of variance showed significant differences in the severity of articular cartilage lesions based on medial meniscus tear morphology ($P < .05$). Compared with bucket-handle/vertical tears, root and radial/flap tears were associated with significantly greater degeneration on the medial femoral condyle; root and complex tears were associated with significantly greater degeneration on the medial tibial plateau; and radial/flap tears were associated with significantly greater degeneration on the lateral tibial plateau. Age and gender were significant predictors of the Noyes medial-compartment score, and age, body mass index, and meniscus tear morphology were significant predictors of the Noyes lateral-compartment score.

CONCLUSIONS:

Meniscus tears with increasing disruption of the circumferential meniscal fibers were significantly associated with cartilage lesions of increasing severity in both the medial and lateral compartments of the knee.

LEVEL OF EVIDENCE:

Level IV, prognostic case series.

Hip

Am J Sports Med. 2012 Mar 22. [Epub ahead of print]

Femoroacetabular Impingement in Former High-Level Youth Soccer Players.

Johnson AC, Shaman MA, Ryan TG.

Source

Department of Orthopaedics and Rehabilitation, University of New Mexico, Albuquerque, New Mexico.

Abstract

BACKGROUND:

Femoroacetabular impingement (FAI) can be a source of hip pain in young adults. Repetitive kicking associated with youth soccer may lead to morphologic changes of the proximal femur that predispose a person to the development of FAI.

HYPOTHESIS:

Young adults who participated in high-level soccer competition as youths are more likely to demonstrate radiographic changes consistent with FAI and to have increased alpha angles as compared with controls.

STUDY DESIGN:

Cross-sectional study; Level of evidence, 3.

METHODS:

Pelvic radiographs (anteroposterior and frog-lateral) were obtained on 50 individuals who participated in high-level soccer during skeletal immaturity and 50 controls who did not participate in high-level soccer. There were 25 men and 25 women in each group. All subjects were between 18 and 30 years of age, had a body mass index of less than 30, and had not sought or received treatment for hip disorders. Radiographs were analyzed independently for the presence of FAI, and alpha angles were measured. Hips with alpha angles that measured greater than or equal to 55° were deemed to have cam deformity.

RESULTS:

Fifteen of the 25 male subjects had evidence of cam deformity, compared with 14 male controls. Nine of the 25 female subjects had evidence of cam deformity, compared with 8 female controls. Neither of these differences was statistically significant. There was a significantly higher prevalence of cam deformity in men as compared with women (29 vs 17, $P = .016$).

CONCLUSION:

Participation in high-level soccer during skeletal immaturity is not associated with a higher risk of development of cam deformity in the young adult years. There is a high prevalence of cam deformity in the young adult population. Males demonstrate a higher prevalence of cam deformity than do females.

PMID: 22442288 [PubMed - as supplied by publisher]

C spine surgery

Eur Spine J. 2012 Mar 23. [Epub ahead of print]

Impact of deep extensor muscle-preserving approach on clinical outcome of laminoplasty for cervical spondylotic myelopathy: comparative cohort study.

Kotani Y, Abumi K, Ito M, Sudo H, Takahata M, Nagahama K, Iwata A, Minami A.

Source

Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Kita-15, Nishi-7, Kitaku, Sapporo, 060-8638, Japan, y-kotani@med.hokudai.ac.jp.

Abstract

INTRODUCTION:

This study aimed to compare patients undergoing deep extensor muscle-preserving laminoplasty and conventional open-door laminoplasty for the treatment of cervical spondylotic myelopathy (CSM). We specifically assessed axial pain, cervical spine function, and quality of life (QOL) with a minimum follow-up period of 3 years.

PATIENTS AND METHODS:

Ninety patients were divided into two groups and underwent either conventional open-door laminoplasty (CL group) or laminoplasty using the deep extensor muscle-preserving approach (MP group). The latter approach was undertaken by preserving the multifidus and semispinalis cervicis attachments followed by open-door laminoplasty and resuturing of the bisected spinous processes at each decompression level. The mean follow-up period was 7.7 years (range, 36-128 months). Preoperative and follow-up evaluations included the Japanese Orthopaedic Association (JOA) score, a tentative version of the JOA Cervical Myelopathy Evaluation Questionnaire (JOACMEQ) including cervical spine function and QOL, and a visual analog scale (VAS) for axial pain. Radiological analyses included cervical lordosis and flexion-extension range of motion (C2-7), as well as deep extensor muscle areas on axial magnetic resonance imaging (MRI).

RESULTS:

The mean number of decompressed laminae was 3.9 and 3.3 in CL and MP groups, respectively, which was statistically equivalent. Japanese Orthopaedic Association recovery was statistically equivalent between the two groups. The MP group demonstrated a superior QOL score (57 vs. 46 %) compared with the CL group at final follow-up ($p < 0.05$). Mean VAS scores at final follow-up were 2.2 and 4.3 in MP and CL groups, respectively ($p < 0.05$). Cervical lordosis and flexion-extension range of motion were statistically equivalent. The percentage deep muscle area on MRI was significantly lesser in the CL group compared with the MP group (58 vs. 102 %; $p < 0.01$).

CONCLUSION:

We demonstrated the superiority of deep extensor muscle-preserving laminoplasty in terms of postoperative axial pain, QOL, and prevention of atrophy of the deep extensor muscles over conventional open-door laminoplasty for the treatment of CSM

Stroke/Ankle dorsi flexion

Arch Phys Med Rehabil. 2012 Mar 20. [Epub ahead of print]

Contribution of Ankle Dorsiflexor Strength to Walking Endurance in People With Spastic Hemiplegia After Stroke.

Ng SS, Hui-Chan CW.

Source

Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China.

Abstract

Ng SS, Hui-Chan CW. Contribution of ankle dorsiflexor strength to walking endurance in people with spastic hemiplegia after stroke.

OBJECTIVES:

(1) To determine the relationships of ankle dorsiflexor strength, ankle plantarflexor strength, and spasticity of the ankle plantarflexors with walking endurance; (2) to determine whether affected ankle dorsiflexor strength makes an independent contribution to walking endurance; and (3) to quantify its relative contribution to the walking endurance of people with spastic hemiplegia after stroke.

DESIGN:

A cross-sectional study.

SETTING:

University-based rehabilitation center.

PARTICIPANTS:

Subjects (N=62) with spastic hemiplegia.

INTERVENTIONS:

Not applicable.

MAIN OUTCOME MEASURES:

Walking endurance was measured by the distance covered in the six-minute walk test (6MWT). Ankle dorsiflexor and plantarflexor strength were measured using a load-cell mounted on a custom-built foot support. Plantarflexor spasticity was measured using the Composite Spasticity Scale.

RESULTS:

The six-minute walk distances showed stronger positive correlation with affected dorsiflexor strength ($r=.793$, $P\leq.000$) when compared with affected plantarflexor strength ($r=.349$, $P=.005$). Results of the regression model showed that after adjusting for basic demographic and stroke-related impairments, affected ankle dorsiflexor strength remained independently associated with six-minute walk distance, accounting for 48.8% of the variance.

CONCLUSIONS:

This is the first study, to our knowledge, to document the importance of ankle dorsiflexor strength as an independent determinant of walking endurance in stroke survivors with spastic plantarflexors. Our findings suggest that stroke rehabilitation programs aiming to improve walking endurance should include strengthening exercises for the ankle dorsiflexors

LBP/ Spondylolisthesis

Eur Spine J. 2012 Mar 21. [Epub ahead of print]

A slip above a slip: retrolisthesis of the motion segment above a spondylolytic spondylolisthesis.

Mehta JS, Kochhar S, Harding JJ.

Source

Bristol Orthopaedic Spine Service, North Bristol Trust, Frenchay Hospital, Beckspool Road, Bristol, BS16 1LE, UK, Jwalant_mehta@hotmail.com.

Abstract

OBJECTIVE:

The purpose of this study is to assess the degenerative changes in the motion segments above a L5S1 spondylolytic spondylolisthesis and to view these in light of the retrolisthesis in the segment immediately above the slip. A spondylolytic spondylolisthesis causes an abnormal motion and predisposes to degenerative changes at the L5S1 disc. Degenerative changes in the adjacent segments would influence the symptomatology and natural history of the disease and the treatment options. The extent of degenerative changes in the levels immediately above a L5S1 spondylolytic spondylolisthesis is not well documented in the literature. We have noted retrolisthesis at this level, but this has not been previously reported or assessed.

MATERIALS AND METHODS:

Thirty-eight patients with a symptomatic L5S1 spondylolytic spondylolisthesis with a mean age of 52.8 years (95% CI 47.2-58.4); 55.3% (n = 21) females and 44.7% (n = 17) males. We assessed the lumbar lordosis, slip angle, sacral slope, grade of the slip, facet angles at L34 and L45 on both sides, facet degenerative score (cartilage and sclerosis values), disc degenerative score (Pfirrmann) at L34, L45 and L5S1 and the presence of retrolisthesis at L45.

RESULTS:

We noted that 29% (11) had a retrolisthesis at L45. The degenerative scores reduced significantly from L5S1 through L45 and L34. Slip angle and L45 disc degenerative score were the only factors that occurred consistently in patients with a retrolisthesis.

CONCLUSIONS:

There is a cascade of degenerative changes that involve both the disc and the facet joints at the levels above a spondylolytic spondylolisthesis. The degenerative changes at the L45 disc and a higher slip angle are consistent findings in patients with a retrolisthesis at the level above the slip

Stretching

Medline@Citation

A Dynamic Warm-up Model Increases Quadriceps Strength and Hamstring Flexibility.

Aguilar AJ, Distefano LJ, Brown CN, Herman DC, Guskiewicz KM, Padua DA

Journal of strength and conditioning research / National Strength & Conditioning Association

201204 26(4):1130-41 Language: eng Country: United States

1Department of Exercise and Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 2Department of Kinesiology, University of Connecticut, Storrs, Connecticut 3Department of Kinesiology, University of Georgia, Athens, Georgia 4Department of Physical Medicine and Rehabilitation, University of Virginia, Charlottesville, Virginia.

ABSTRACT: Aguilar, AJ, DiStefano, LJ, Brown, CN, Herman, DC, Guskiewicz, KM, and Padua, DA. A dynamic warm-up model increases quadriceps strength and hamstring flexibility. *J Strength Cond Res* 26(4): 1130-1141, 2012-Research suggests that static stretching can negatively influence muscle strength and power and may result in decreased functional performance. The dynamic warm-up (DWU) is a common alternative to static stretching before physical activity, but there is limited research investigating the effects of a DWU. The purpose of this study was to compare the acute effects of a DWU and static stretching warm-up (SWU) on muscle flexibility, strength, and vertical jump using a randomized controlled trial design. Forty-five volunteers were randomly assigned into a control (CON), SWU, or DWU group. All participants rode a stationary bicycle for 5 minutes and completed a 10-minute warm-up protocol. During this protocol, the DWU group performed dynamic stretching and running, the SWU group performed static stretching, and the CON group rested. Dependent variables were measured immediately before and after the warm-up protocol. A digital inclinometer measured flexibility (degrees) for the hamstrings, quadriceps, and hip flexor muscles. An isokinetic dynamometer measured concentric and eccentric peak torque (N·m/kg) for the hamstrings and quadriceps. A force plate was used to measure vertical jump height (meters) and power (watts). In the DWU group, there was a significant increase in hamstring flexibility (pretest: $26.4 \pm 13.5^\circ$, posttest: $16.9 \pm 9.4^\circ$; $p < .0001$) and eccentric quadriceps peak torque (pretest: 2.49 ± 0.83 N·m/kg, posttest: 2.78 ± 0.69 N·m/kg; $p = 0.04$). The CON and SWU did not significantly affect any flexibility, strength, or vertical jump measures ($p > 0.05$). The DWU significantly improved eccentric quadriceps strength and hamstrings flexibility, whereas the SWU did not facilitate any positive or negative changes in muscle flexibility, strength, power, or vertical jump. Therefore, the DWU may be a better preactivity warm-up choice than an SWU.

PMID: 22446678

Hamstrings

Br J Sports Med. 2012 Feb;46(2):103-9. Epub 2011 Oct 28.

Therapeutic interventions for acute hamstring injuries: a systematic review.

Reurink G, Goudswaard GJ, Tol JL, Verhaar JA, Weir A, Moen MH.

Source

Department of Orthopaedics, Erasmus Medical Centre, Rotterdam, The Netherlands.
g.reurink@erasmusmc.nl.

Abstract

BACKGROUND:

Despite the high rate of hamstring injuries, there is no consensus on their management, with a large number of different interventions being used. Recently several new injection therapies have been introduced.

OBJECTIVE:

To systematically review the literature on the effectiveness of therapeutic interventions for acute hamstring injuries.

DATA SOURCES:

The databases of PubMed, EMBASE, Web of Science, Cochrane Library, CINAHL and SPORTDiscus were searched in May 2011. Study eligibility criteria Prospective studies comparing the effect of an intervention with another intervention or a control group without intervention in subjects with acute hamstring injuries were included.

DATA ANALYSIS:

Two authors independently screened the search results and assessed risk of bias. Quality assessment of the included studies was performed using the Physiotherapy Evidence Database score. A best evidence synthesis was used to identify the level of evidence.

MAIN RESULTS:

Six studies were included in this systematic review. There is limited evidence for a positive effect of stretching, agility and trunk stability exercises, intramuscular actovegin injections or slump stretching in the management of acute hamstring injuries. Limited evidence was found that there is no effect of non-steroidal anti-inflammatory drugs or manipulation of the sacroiliac joint.

CONCLUSIONS:

There is a lack of high quality studies on the treatment of acute hamstring injuries. Only limited evidence was found to support the use of stretching, agility and trunk stability exercises, intramuscular actovegin injections or slump stretching. Further research is needed using an appropriate control group, randomisation and blinding.

PMID: 22039218 [PubMed - indexed for MEDLINE]

Hamstring

Br J Sports Med. 2012 Feb;46(2):118-23. Epub 2011 Mar 10.

Altered muscle activation following hamstring injuries.

Sole G, Milosavljevic S, Nicholson H, Sullivan SJ.

OBJECTIVE:

The purpose of this study was to compare the electromyographic (EMG) activity of gluteal and thigh muscles of sportspeople with a recent hamstring injury with uninjured controls during a weight-bearing task.

STUDY DESIGN:

Cross-sectional.

SETTING:

University laboratory.

PARTICIPANTS:

16 participants with a hamstring injury (hamstring-injured group, HG) and 18 control participants (control group (CG)) participated in the study.

MAIN OUTCOME MEASURE:

The EMG activity of gluteal, quadriceps and hamstring muscles was recorded during a movement from double- to single-leg movement using surface electrodes.

RESULTS:

The EMG onsets of biceps femoris and medial hamstrings were significantly earlier for the HG injured and the uninjured sides in preparation for single-leg standing when compared with the CG average. There were no differences in onsets for the gluteal and quadriceps muscles when comparing the injured or uninjured legs of the HG to the bilateral average of the CG.

CONCLUSION:

The earlier onset of the injured and the uninjured hamstrings in preparation for single leg stance of the HG in comparison with the CG suggests an alteration in the motor control of these muscles. Altered neuromuscular control following a hamstring injury may be a factor to be considered in the rehabilitation of hamstring injuries.

PMID: 21393256 [PubMed - indexed for MEDLINE]

Manipulation/visceral

J Electromyogr Kinesiol. 2012 Mar 20. [Epub ahead of print]

Visceral responses to spinal manipulation.

Bolton PS, Budgell B.

Source

School of Biomedical Sciences & Pharmacy, Faculty of Health, University of Newcastle, Callaghan NSW 2308, Australia; Centre for Brain and Mental Health Research at the Hunter Medical Research Institute, Newcastle, Australia.

Abstract

While spinal manipulation is widely seen as a reasonable treatment option for biomechanical disorders of the spine, such as neck pain and low back pain, the use of spinal manipulation to treat non-musculoskeletal complaints remains controversial. This controversy is due in part to the perception that there is no robust neurobiological rationale to justify using a biomechanical treatment of the spine to address a disorder of visceral function. This paper therefore looks at the physiological evidence that spinal manipulation can impact visceral function. A structured search was conducted, using PubMed and the Index to Chiropractic Literature, to construct a corpus of primary data studies in healthy human subjects of the effects of spinal manipulation on visceral function. The corpus of literature is not large, and the greatest number of papers concerns cardiovascular function. Authors often attribute visceral effects of spinal manipulation to somato-autonomic reflexes. While this is not unreasonable, little attention is paid to alternative mechanisms such as somato-humoural pathways. Thus, while the literature confirms that mechanical stimulation of the spine modulates some organ functions in some cohorts, a comprehensive neurobiological rationale for this general phenomenon has yet to appear.

Copyright © 2012 Elsevier Ltd. All rights reserved.

PMID: 22440554 [PubMed - as supplied by publisher]

Stretching

Appl Physiol Nutr Metab. 2011 Dec;36(6):790-7. Epub 2011 Oct 20.

Relative static stretch-induced impairments and dynamic stretch-induced enhancements are similar in young and middle-aged men.

Behm DG, Plewe S, Grage P, Rabbani A, Beigi HT, Byrne JM, Button DC.

Source

School of Human Kinetics and Recreation, Memorial University of Newfoundland, St. John's NL A1C 5S7, Canada. dbehm@mun.ca

Abstract

Middle-aged individuals may not respond in a similar manner as younger individuals. The study's objective was to examine the effect of static (SS) and dynamic stretching (DS) in young and middle-aged men on subsequent performance. Ten young (22 ± 1.4 years) and 8 middle-aged men (46.3 ± 6.5 years) participated in 3 conditions consisting of SS (4×30 s for right and left quadriceps, hamstrings, and plantar flexors), DS (8×30 s of bilateral butt kicks, walking lunges, and plantar flexors) and control. Dependent variables included sit and reach, hip extension flexibility, countermovement jump (CMJ) height, drop jump (DJ) height, static balance, reaction (RT) and movement time (MT). Measurements were taken pre-intervention, post- and 10 min post-intervention. A 3-way repeated measurement ANOVA revealed that the younger men had higher jump heights, faster RT and MT, and greater flexibility than the middle-aged men. DS significantly enhanced DJ ($p = 0.04$) and CMJ ($p = 0.006$) height compared with SS and control conditions. SS ($p < 0.0001$) and DS ($p = 0.004$) post-intervention sit and reach scores were significantly greater than pre-intervention scores. There were no significant differences between the SS and DS sit and reach scores. CMJ heights were impaired ($p = 0.04$) by SS. Conversely, DS post-intervention jump heights were significantly ($p < 0.0001$) higher than SS post-, control post-, and control 10 min post-intervention. SS-induced impairments and DS-induced enhancements of CMJ height were not affected by age. DS provided similar improvements in sit and reach scores as SS. DS is recommended as the most appropriate stretching routine prior to work or athletic performance for younger and middle-aged men.

PMID: 22014144 [PubMed - indexed for MEDLINE]

STM/Massage/delivery

Arch Gynecol Obstet. 2012 Jan 21. [Epub ahead of print]

Effects of massage therapy and presence of attendant on pain, anxiety and satisfaction during labor.

Mortazavi SH, Khaki S, Moradi R, Heidari K, Vasegh Rahimparvar SF.

Source

Students' Scientific Research Center, School of Medicine, Tehran University of Medical Science, Tehran, Iran.

Abstract

PURPOSE:

To investigate the effects of massage and presenting an attendant on pain, anxiety and satisfaction during labor to clarify some aspects of using an alternative complementary strategy.

METHODS:

120 primiparous women with term pregnancy were divided into massage, attendant and control groups randomly. Massage group received firm and rhythmic massage during labor in three phases. After 30 min massage at each stage, pain, anxiety and satisfaction levels were evaluated. Self-reported present pain intensity scale was used to measure the labor pain. Anxiety and satisfaction were measured with the standard visual analog scale.

RESULTS:

Massage group had lower pain state in second and third phases ($p < 0.05$) in comparison with attendant group but reversely, the level of anxiety was lower in attendant group in second and third phases ($p < 0.05$) and satisfaction was higher in massage group in all four phases ($p < 0.001$). The massage group had lower pain and anxiety state in three phases in comparison with control group ($p < 0.05$). Data analysis of satisfaction level showed higher values in four phases in massage group compared with control ($p < 0.001$) and comparison of attendant and control groups showed higher satisfaction in attendant group in phases 2, 3 and 4 as well ($p < 0.001$). Duration of active phase was lower in massage group ($p < 0.001$).

CONCLUSIONS:

Findings suggest that massage is an effective alternative intervention, decreasing pain and anxiety during labor and increasing the level of satisfaction. Also, the supportive role of presenting an attendant can positively influence the level of anxiety and satisfaction.

PMID: 22271239 [PubMed - as supplied by publisher]

SI Manipulation

Arch Phys Med Rehabil. 2012 Jan;93(1):56-61.

Sacroiliac joint manipulation attenuates alpha-motoneuron activity in healthy women: a quasi-experimental study.

Orakifar N, Kamali F, Pirouzi S, Jamshidi F.

Source

Physiotherapy Section, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran.

Abstract

OBJECTIVE:

To determine whether sacroiliac joint (SIJ) manipulation decreases α -motoneuron activity and increases the pressure pain threshold (PPT) over the posterior superior iliac spine (PSIS) in healthy women.

DESIGN:

Quasi-experimental study.

SETTING:

A university medical center.

PARTICIPANTS:

Healthy young women (N=20) aged 18 to 30 years were recruited from among the students of a university medical center after a request for volunteers.

INTERVENTIONS:

Joint manipulation consisted of the supine rotational glide manipulation for the sacroiliac region. PPT measurements from the PSIS and Hoffman-reflex (H-reflex) amplitudes from the tibial nerve on the same side were recorded before and after joint manipulation. PPT was monitored for 15 minutes and H-reflex for 20 minutes after the procedure.

MAIN OUTCOME MEASURES:

Changes in tibial nerve H-reflex amplitude and PPT values after SIJ manipulation.

RESULTS:

SIJ manipulation attenuated α -motoneuronal activity significantly ($P<.05$) but transiently, since the decrease was seen only for 20 seconds after the intervention. There was no positive significant difference in the PPT after SIJ manipulation at any time during postintervention follow-up.

CONCLUSIONS:

SIJ manipulation produced a transient attenuation of α -motoneuron excitability in healthy women. These findings demonstrate that our manipulation technique can lead to a short-term reduction in muscle tone as a result of changes in sensory discharge, predominantly in Ia afferents. SIJ manipulation did not significantly affect the PPT in healthy women.

Copyright © 2012 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved

Stretching

Clin Biomech (Bristol, Avon). 2012 Mar;27(3):306-12. Epub 2011 Nov 1.

Lack of effect of moderate-duration static stretching on plantar flexor force production and series compliance.

Cannavan D, Coleman DR, Blazeovich AJ.

Source

Physical Education and Exercise Science, College of Arts and Sciences, Seattle Pacific University, Seattle, USA; Centre for Sports Medicine and Human Performance, School of Sport and Education, Brunel University, Uxbridge, England, United Kingdom.

Abstract

BACKGROUND:

The effects of an acute bout of moderate-duration static stretching on plantar flexor force production, series compliance of the muscle-tendon unit, and levels of neuromuscular activation were examined.

METHODS:

Eighteen active individuals (9 men and 9 women) performed four 45-s static plantar flexor stretches and a time-matched control of no stretch (where subjects remained seated in the dynamometer for 4min with no stretch being performed). Measures of peak isometric moment, rate of force development, neuromuscular activation (interpolated twitch technique and electromyography), twitch force characteristics, passive moment during stretch, and tendon elongation during maximal voluntary contractions were taken before and after the stretching.

FINDINGS:

Despite a significant stress-relaxation response during stretch (9.3%, $P < 0.01$) there were no significant differences in peak isometric moment ($P = 0.35$; effect size 0.13), rate of force development ($P = 0.93$; effect size 0.01), neuromuscular activation (interpolated twitch: $P = 0.86$; electromyography: $P = 0.09$; effect size 0.02), or tendon elongation ($P = 0.61$; effect size 0.07) after stretching. Twitch characteristics were also unchanged after stretching, although there was a reduction in the rate of twitch torque relaxation ($RR(t)$; $P < 0.01$).

INTERPRETATION:

The acute bout of moderate-duration static stretching did not impair the force generating capacity of the plantar flexors or negatively affect muscle-tendon mechanical properties. Static stretching may not always have detrimental consequences for force production. Thus, clinicians may be able to apply moderate-duration stretches to patients without risk of reducing muscular performance.

Copyright © 2011 Elsevier Ltd. All rights reserved

Guided Imagery

Trials. 2012 Jan 23;13(1):11. [Epub ahead of print]

Comparison of embedded and added motor imagery training in patients after stroke: results of a randomised controlled pilot trial.

Schuster C, Butler J, Andrews B, Kischka U, Ettlin T.

Abstract

ABSTRACT:

BACKGROUND:

Motor imagery (MI) when combined with physiotherapy can offer functional benefits after stroke. Two MI integration strategies exist: added and embedded MI. Both approaches were compared when learning a complex motor task (MT): 'Going down, laying on the floor, and getting up again'.

METHODS:

Outpatients after first stroke participated in a single-blinded, randomised controlled trial with MI embedded into physiotherapy (EG1), MI added to physiotherapy (EG2), and a control group (CG). All groups participated in six physiotherapy sessions. Primary study outcome was time (sec) to perform the motor task at pre and post-intervention. Secondary outcomes: level of help needed, stages of MT-completion, independence, balance, fear of falling (FOF), MI ability. Data were collected four times: twice during one week baseline phase (BL, T0), following the two week intervention (T1), after a two week follow-up (FU). Analysis of variance was performed.

RESULTS:

Thirty nine outpatients were included (12 females, age: 63.4 \pm 10 years; time since stroke: 3.5 \pm 2 years; 29 with an ischemic event). All were able to complete the motor task using the standardised 7-step procedure and reduced FOF at T0, T1, and FU. Times to perform the MT at baseline were 44.2 \pm 22s, 64.6 \pm 50s, and 118.3 \pm 93s for EG1 (N=13), EG2 (N=12), and CG (N=14). All groups showed significant improvement in time to complete the MT (p <0.001) and degree of help needed to perform the task: minimal assistance to supervision (CG) and independent performance (EG1+2). No between group differences were found. Only EG1 demonstrated changes in MI ability over time with the visual indicator increasing from T0 to T1 and decreasing from T1 to FU. The kinaesthetic indicator increased from T1 to FU. Patients indicated to value the MI training and continued using MI for other difficult-to-perform tasks.

CONCLUSIONS:

Embedded or added MI training combined with physiotherapy seem to be feasible and beneficial to learn the MT with emphasis on getting up independently. Based on their baseline level CG had the highest potential to improve outcomes. A patient study with 35 patients per group could give a conclusive answer of a superior MI integration strategy. The study was registered with ClinicalTrials.gov: NCT00858910.

PMID: 22269834 [PubMed - as supplied by publisher]

Stretching

Scand J Med Sci Sports. 2012 Feb 8. doi: 10.1111/j.1600-0838.2012.01444.x. [Epub ahead of print]

Does pre-exercise static stretching inhibit maximal muscular performance? A meta-analytical review.

Simic L, Sarabon N, Markovic G.

Source

Motor Control and Human Performance Laboratory, School of Kinesiology, University of Zagreb, Zagreb, Croatia.

Abstract

We applied a meta-analytical approach to derive a robust estimate of the acute effects of pre-exercise static stretching (SS) on strength, power, and explosive muscular performance. A computerized search of articles published between 1966 and December 2010 was performed using PubMed, SCOPUS, and Web of Science databases. A total of 104 studies yielding 61 data points for strength, 12 data points for power, and 57 data points for explosive performance met our inclusion criteria. The pooled estimate of the acute effects of SS on strength, power, and explosive performance, expressed in standardized units as well as in percentages, were -0.10 [95% confidence interval (CI): -0.15 to -0.04], -0.04 (95% CI: -0.16 to 0.08), and -0.03 (95% CI: -0.07 to 0.01), or -5.4% (95% CI: -6.6% to -4.2%), -1.9% (95% CI: -4.0% to 0.2%), and -2.0% (95% CI: -2.8% to -1.3%). These effects were not related to subject's age, gender, or fitness level; however, they were more pronounced in isometric vs dynamic tests, and were related to the total duration of stretch, with the smallest negative acute effects being observed with stretch duration of ≤ 45 s. We conclude that the usage of SS as the sole activity during warm-up routine should generally be avoided.

© 2012 John Wiley & Sons A/S.

PMID: 22316148 [PubMed - as supplied by publisher]

Core

Spine (Phila Pa 1976). 2011 Dec 3. [Epub ahead of print]

Effect of Core Stability Exercises on Feedforward Activation of Deep Abdominal Muscles in Chronic Low Back Pain: A Randomized Controlled Trial.

Vasseljen O, Unsgaard-Tøndel M, Westad C, Mork PJ.

Source

Department of Public Health and General Practice, Faculty of Medicine, Norwegian University of Science and Technology, P.b. 8905, MTF5, 7491 Trondheim, NORWAY. Department of Public Health and General Practice, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway Department of Human Movement Science, Faculty of Social Science and Technology Management, Norwegian University of Science and Technology Trondheim, Norway Department of Human Movement Science, Faculty of Social Science and Technology Management, Norwegian University of Science and Technology, Trondheim, Norway.

Abstract

ABSTRACT: Study Design. Randomized controlled trial. Objective. To investigate feedforward activation or timing of abdominal muscle activation in response to rapid shoulder flexion after 8 weeks with core stability exercises, sling exercises, or general exercises in patients with chronic nonspecific low back pain (LBP). Summary of Background Data. Delayed onset in abdominal muscles has been associated with LBP. Low load exercises to volitionally activate the transversus abdominis were introduced to restore trunk muscle activation deficits. More forceful co-contraction exercises have been advocated by others. This study explored if abdominal muscle onset changed after low load core stability exercises, high load sling exercises, or general exercises. Methods. Subjects (N = 109) with chronic nonspecific LBP of at least three months duration were randomly assigned to 8 weekly treatments with low load core stability exercises, high load stabilizing exercises in slings, or general exercises in groups. Primary outcome was onset recorded bilaterally by m-mode ultrasound imaging in the deep abdominal muscles in response to rapid shoulder flexion. Results. No or small changes were found in onset after treatment. Baseline-adjusted between group differences showed a 15 ms (95% CI, 1-28, P = 0.03) and a 19 ms (95% CI, 5-33, P < 0.01) improvement with sling relative to core stability and general exercises, respectively, but on one side only. There was no association between changes in pain and onset over the intervention period (R ≤ 0.02). Conclusion. Abdominal muscle onset was largely unaffected by 8 weeks of exercises in patients with chronic LBP. There was no association between change in onset and LBP. Large individual variations in activation pattern of the deep abdominal muscles may justify exploration of differential effects in subgroups of LBP.

PMID: 22146280 [PubMed - as supplied by publisher]

LBP

BMC Musculoskelet Disord. 2012 Mar 30;13(1):49. [Epub ahead of print]

Chronic low back pain is associated with reduced vertebral bone mineral measures in community-dwelling adults.

Briggs AM, Straker LM, Burnett AF, Wark JD.

Abstract

ABSTRACT:

BACKGROUND:

Chronic low back pain (CLBP) experienced in middle-age may have important implications for vertebral bone health, although this issue has not been investigated as a primary aim previously. This study investigated the associations between CLBP and dual energy X-ray absorptiometry (DXA)-derived vertebral bone mineral measures acquired from postero-anterior and lateral-projections, among community-dwelling, middle-aged adults.

METHODS:

Twenty-nine adults with CLBP (11 male, 18 female) and 42 adults with no history of LBP in the preceding year (17 male, 25 female) were evaluated. Self-reported demographic and clinical data were collected via questionnaires. Areal bone mineral density (aBMD) was measured in the lumbar spine by DXA. Apparent volumetric (ap.v) BMD in the lumbar spine was also calculated. Multiple linear regression models were used to examine associations between study group (CLBP and control) and vertebral DXA variables by gender, adjusting for height, mass and age.

RESULTS:

There was no difference between groups by gender in anthropometrics or clinical characteristics. In the CLBP group, the mean (SD) duration of CLBP was 13.3 (10.4) years in males and 11.6 (9.9) years in females, with Oswestry Disability Index scores of 16.2 (8.7)% and 15.4 (9.1)%, respectively. Males with CLBP had significantly lower adjusted lateral-projection aBMD and lateral-projection ap.vBMD than controls at L3 with mean differences (standard error) of 0.09 (0.04) g/cm² (p = 0.03) and 0.02 (0.01) g/cm³ (p = 0.04). These multivariate models accounted for 55% and 53% of the variance in lateral-projection L3 aBMD and lateral-projection L3 ap.vBMD.

CONCLUSIONS:

CLBP in males is associated with some lumbar vertebral BMD measures, raising important questions about the mechanism and potential clinical impact of this association.

PMID: 22458361 [PubMed - as supplied by publisher]

LBP

Ergonomics. 2012 Apr;55(4):500-7. Epub 2012 Mar 8.

One lumbar extension training session per week is sufficient for strength gains and reductions in pain in patients with chronic low back pain ergonomics.

Bruce-Low S, Smith D, Burnet S, Fisher J, Bissell G, Webster L.

Source

a Department of Sport and Exercise Science , Southampton Solent University, East Park Terrace , Southampton , SO14 0YN , UK.

Abstract

Chronic low back pain (CLBP) is the leading cause of absenteeism from the workplace and research into exercise interventions to address this problem is required. This study investigated training frequency for participants with CLBP. Participants either trained once a week (1 × week, n = 31), or twice a week (2 × week, n = 20) or did not (control group, n = 21). Participants were isometric strength tested in weeks 1 and 12 and trained dynamically either 1×week (80% of maximum) or 2×week (80% and 50%). The results (pre vs. post) showed significant increases in maximal strength, range of motion and reductions in pain for both training groups. Pain scores for the 1 × week and 2 × week both reached minimal clinical improvement change unlike the control group. Thus, one lumbar extension training session per week is sufficient for strength gains and reductions in pain in low back pain in CLBP patients. Practitioner Summary: CLBP is the leading cause of absenteeism from the workplace. The present study using a modified randomised control trial design investigated exercise training frequency for participants with CLBP. One lumbar extension training session per week is sufficient for strength gains and reductions in low back pain in CLBP patients

Exercise

Eur J Appl Physiol. 2012 Feb 12. [Epub ahead of print]

Early-phase muscular adaptations in response to slow-speed versus traditional resistance-training regimens.

Schuenke MD, Herman JR, Gliders RM, Hagerman FC, Hikida RS, Rana SR, Ragg KE, Staron RS.

Source

Department of Anatomy, College of Osteopathic Medicine, University of New England, Biddeford, ME, 04005, USA, mschuenke@une.edu.

Abstract

Thirty-four untrained women participated in a 6-week program to investigate slow-speed versus "normal" speed resistance-training protocols. Subjects were divided into: slow-speed (SS), normal-speed/traditional-strength (TS), normal-speed/traditional muscular endurance (TE), and non-exercising control (C) groups. Leg press, squats, and knee extensions were performed 2 days/week for the first week and 3 days/week for the remaining 5 weeks (~2 min rest). The SS group performed 6-10 repetitions maximum (6-10RM) for each set with 10 s concentric (con) and 4 s eccentric (ecc) contractions. The TS and TE groups performed sets of 6-10RM and 20-30RM, respectively, at "normal" speed (1-2 s/con and ecc contractions). TE and SS trained at the same relative intensity (~40-60% 1RM), whereas TS trained at ~80-85% 1RM. Pre- and post-training muscle biopsies were analyzed for fiber-type composition, cross-sectional area (CSA), and myosin heavy chain (MHC) content. The percentage of type IIX fibers decreased and IIX increased in all three training groups. However, only TS showed an increase in percentage of type IIA fibers. CSA of fiber types I, IIA, and IIX increased in TS. In SS, only the CSA of IIA and IIX fibers increased. These changes were supported by MHC data. No significant changes for any parameters were found for the C group. In conclusion, slow-speed strength training induced a greater adaptive response compared to training with a similar resistance at "normal" speed. However, training with a higher intensity at "normal" speed resulted in the greatest overall muscle fiber response in each of the variables assessed.

PMID: 22328004 [PubMed - as supplied by publisher]

Core

Eur Spine J. 2012 Jan 24. [Epub ahead of print]

Spine stabilisation exercises in the treatment of chronic low back pain: a good clinical outcome is not associated with improved abdominal muscle function.

Mannion AF, Caporaso F, Pulkovski N, Sprott H.

Source

Spine Center Division, Department of Research and Development, Schulthess Klinik, Lengghalde 2, 8008, Zurich, Switzerland, anne.mannion@kws.ch.

Abstract

INTRODUCTION:

Various studies have shown that spine stabilisation exercise therapy elicits improvements in symptoms/disability in patients with chronic non-specific low back pain (cLBP). However, few have corroborated the intended mechanism of action by examining whether clinical improvements (1) are greater in patients with functional deficits of the targeted muscles and (2) correlate with post-treatment improvements in abdominal muscle function.

METHODS:

Pre and directly after 9 weeks' therapy, 32 cLBP patients (44.0 ± 12.3 years) rated their LBP intensity (0-10) and disability (0-24, Roland-Morris; RM) and completed psychological questionnaires. At the same timepoints, the voluntary activation of transversus abdominis (TrA), obliquus internus and obliquus externus during "abdominal-hollowing" and the anticipatory ("feedforward") activation of these muscles during rapid arm movements were measured using M-mode ultrasound with tissue Doppler imaging.

RESULTS:

Pre-therapy to post-therapy, RM decreased from 8.9 ± 4.7 to 6.7 ± 4.3 , and average pain, from 4.7 ± 1.7 to 3.5 ± 2.3 (each $P < 0.01$). The ability to voluntarily activate TrA increased by 4.5% ($P = 0.045$) whilst the anticipatory activation of the lateral abdominal muscles showed no significant change ($P > 0.05$). There was no significant correlation between the change in RM scores after therapy and either baseline values for voluntary ($r = 0.24$, $P = 0.20$) or anticipatory activation ($r = 0.04$, $P = 0.84$), or their changes after therapy (voluntary, $r = 0.08$, $P = 0.66$; anticipatory, $r = 0.16$, $P = 0.40$). In multiple regression, only a reduction in catastrophising ($P = 0.0003$) and in fingertip-floor distance ($P = 0.0006$) made unique contributions to explaining the variance in the reduction in RM scores.

CONCLUSION:

Neither baseline lateral abdominal muscle function nor its improvement after a programme of stabilisation exercises was a statistical predictor of a good clinical outcome. It is hence difficult to attribute the therapeutic result to any specific effects of the exercises on these trunk muscles. The association between changes in catastrophising and outcome serves to encourage further investigation on larger groups of patients to clarify whether stabilisation exercises have some sort of "central" effect, unrelated to abdominal muscle function per se.

PMID: 22270245 [PubMed - as supplied by publisher]

Gait

Exp Brain Res. 2012 Mar 13. [Epub ahead of print]

Effects of implicit visual feedback distortion on human gait.

Kim SJ, Krebs HI.

Source

Newman Laboratory for Biomechanics and Human Rehabilitation, Massachusetts Institute of Technology, 77 Massachusetts Avenue, 3-147, Cambridge, MA, 02139, USA.

Abstract

Gait rehabilitation after stroke often utilizes treadmill training delivered by either therapists or robotic devices. However, clinical results have shown no benefit from this modality when compared to usual care. On the contrary, results were inferior; perhaps, because in its present form it is not interactive and at least for stroke, central pattern generators at the spinal level do not appear to be the key to promote recovery. To enable gait therapy to be more effective, therapy must be interactive and visual feedback appears to be an important option to engage patients' participation. In this study, we tested healthy subjects to see whether an implicit "visual feedback distortion" influences gait spatial pattern. Subjects were not aware of the visual distortion nor did they realize changes in their gait pattern. The visual feedback of step length symmetry was distorted so that subjects perceived their step length as being asymmetric during treadmill training. We found that a gradual distortion of visual feedback, without explicit knowledge of the manipulation, systematically modulated gait step length away from symmetry and that the visual distortion effect was robust even in the presence of cognitive load. This indicates that although the visual feedback display used in this study did not create a conscious and vivid sensation of self-motion (the properties of the optical flow), experimental modifications of visual information of subjects' movement were found to cause implicit gait modulation. Nevertheless, our results indicate that modulation with visual distortion may require cognitive resources because during the distraction task, the amount of gait modulation was reduced. Our results suggest that a therapeutic program involving visual feedback distortion, in the context of gait rehabilitation, may provide an effective way to help subjects correct gait patterns, thereby improving the outcome of rehabilitation.

Manipulation/T spine

J Manipulative Physiol Ther. 2012 Feb 17. [Epub ahead of print]

Short-Term Effects of Manipulation to the Upper Thoracic Spine of Asymptomatic Subjects on Plasma Concentrations of Epinephrine and Norepinephrine-A Randomized and Controlled Observational Study.

Puhl AA, Injeyan HS.

Source

Chiropractic Intern, Canadian Memorial Chiropractic College, Toronto, Ontario, Canada.

Abstract

OBJECTIVE:

The purpose of this study was to investigate the short-term effects of spinal manipulation applied to a hypomobile segment of the upper thoracic spine (T1-T6), on plasma concentrations of norepinephrine (NE) and epinephrine (E) in asymptomatic subjects, under strictly controlled conditions.

METHODS:

Fifty-six asymptomatic subjects were randomly assigned to receive either a chiropractic manipulative intervention or a sham intervention in the upper thoracic spine. A 20-gauge catheter fitted with a saline lock was used to sample blood before, immediately after, and 15 minutes after intervention. Plasma NE and E concentrations were determined using an enzyme-linked immunosorbent assay. Changes in plasma catecholamine concentrations were analyzed within and between groups using 1- and 2-sample t tests, respectively.

RESULTS:

The plasma samples of 36 subjects (18 treatment, 18 control) were used in the analysis. Mean plasma concentrations of NE and E did not significantly differ between the 2 groups at any time point and did not change significantly after either the manipulative or sham intervention.

CONCLUSIONS:

The results of this study indicate that a manipulative thrust directed to a hypomobile segment in the upper thoracic spine of asymptomatic subjects does not have a measurable effect on the plasma concentrations of NE or E. These results provide a baseline measure of the sympathetic response to spinal manipulation.

Copyright © 2012 National University of Health Sciences. Published by Mosby, Inc. All rights reserved.

PMID: 22343005 [PubMed - as supplied by publisher]

Stretching

J Sport Rehabil. 2012 Mar 2. [Epub ahead of print]

Neuromuscular Origins of Adaptation do not Exist Following a Long-term Stretching Program.

Hayes BT, Harter RA, Widrick JJ, Hoffman M, Williams D, Hicks-Little CA.

Source

Department of Exercise and Sport Science, University of Utah, Salt Lake City, UT.

Abstract

CONTEXT:

Static stretching is commonly used during the treatment and rehabilitation of orthopedic injuries as a method to increase joint range of motion (ROM) and muscle flexibility. Understanding the physiological adaptations that occur in the neuromuscular system as a result of long-term stretching may provide insight into the mechanisms responsible for changes in flexibility.

OBJECTIVE:

To examine possible neurological origins and adaptations in the Ia reflex pathway that allow for increases in flexibility in ankle ROM, by evaluating the reduction in the synaptic transmission of Ia afferents to the motoneuron pool.

DESIGN:

A repeated measure, case-controlled study.

SETTING:

Sports Medicine Research Laboratory.

PATIENTS OR OTHER PARTICIPANTS:

Forty healthy subjects with no history of cognitive impairment, neurological impairment, or lower extremity surgery and/or injury within the previous 12 months volunteered for this study.

INTERVENTION:

Pre-synaptic and post-synaptic mechanisms were evaluated with a chronic stretching protocol. Twenty subjects stretched 5 times a week for 6 weeks. All subjects were measured at baseline, 3 weeks, and 6 weeks.

MAIN OUTCOME MEASURES:

Ankle dorsiflexion ROM, Hmax/Mmax, pre-synaptic inhibition, and disynaptic reciprocal inhibition.

RESULTS:

Only ROM had a significant interaction between group and time, whereas, the other dependent variables did not detail significant differences. The experimental group had significantly improved ROM from baseline to 3 weeks (mean= 6.2 ± 0.9 , $P < 0.001$), 3 weeks to 6 weeks (mean= 5.0 ± 0.8 , $P < 0.001$), and baseline to 6 weeks (mean= 11.2 ± 0.9 , $P < 0.001$).

CONCLUSIONS:

Ankle dorsiflexion increased by 42.25% after six weeks of static stretching, however, no significant neurological changes resulted at any point of the study contrasting current literature. Significant neuromuscular origins of adaptation do not exist in the Ia reflex pathway components following a long-term stretching program as currently understood. Thus, any increases in flexibility are the result of other factors, potentially mechanical changes and/or stretch tolerance

PNF/Stretching

J Strength Cond Res. 2012 Mar 3. [Epub ahead of print]

A Comparison of Assisted and Unassisted Proprioceptive Neuromuscular Facilitation Techniques and Static Stretching.

Maddigan ME, Peach AA, Behm DG.

Source

School of Human Kinetics and Recreation, Memorial University of Newfoundland, St. John's, Newfoundland, Canada, A1C 5S7.

Abstract

Proprioceptive neuromuscular facilitation (PNF) stretching often requires a partner. Straps are available allowing an individual to perform PNF stretching alone. It is not known if a strap provides similar improvements in range of motion (ROM) as partner assisted PNF or static stretching. The purpose of this study was to compare assisted and unassisted (with a strap) PNF stretching, and static stretching. Hip joint ROM, reaction time (RT) and movement time (MT) were measured pre- and post-stretching. Thirteen recreationally active adults participated in this study. Participants were subjected to 5 different stretch interventions in a random order on separate days. Stretch conditions included unassisted PNF stretching using 1) isometric, 2) concentric, and 3) eccentric contractions with a stretch strap, 4) partner assisted isometric PNF and 5) static stretching. RT, MT, dynamic, active, passive hip flexion angle and angular velocity with dynamic hip flexion were measured before and after the intervention. ROM improved ($p < 0.05$) 2.6%, 2.7% and 5.4% respectively with dynamic, active static and passive static ROM, but there was no significant difference between the stretching protocols. There was a main effect for time ($p < 0.05$) with all stretching conditions negatively impacting dynamic angular velocity (9.2%). Whereas there was no significant effect on RT, MT showed a negative main effect for time ($p < 0.05$) slowing 3.4%. In conclusion, all three forms of active stretching provided similar improvements in ROM as well as post-stretching performance decrements in MT and angular velocity. Thus, individuals can implement PNF stretching techniques with a partner or alone with a strap to improve ROM but athletes should not use these techniques before important competitions or training due to the impairment of limb velocity and MT.

PMID: 22395273 [PubMed - as supplied by publishe

PNF/Stretching

J Strength Cond Res. 2012 Mar 3. [Epub ahead of print]

Effects of proprioceptive neuromuscular facilitation stretching and static stretching on maximal voluntary contraction.

Miyahara Y, Naito H, Ogura Y, Katamoto S, Aoki J.

Source

1 Department of Sports and Health Sciences, Faculty of Human Sciences, University of East Asia; 2 Graduate School of Health and Sports Science, Juntendo University; 3 Institutes of Health and Sports Science & Medicine, Juntendo University; 4 Department of Physiology, St. Marianna University School of Medicine.

Abstract

This study was undertaken to investigate and compare the effects of proprioceptive neuromuscular facilitation (PNF) stretching and static stretching on maximal voluntary contraction (MVC). Thirteen male university students (age, 20 ± 1 years; height, 172.2 ± 4.6 cm; weight, 68.4 ± 6.7 kg; mean \pm SD) completed three different conditions on three non-consecutive days in randomized order: static stretching (SS), PNF stretching (PNF), and no stretching (control, CON). Each condition consisted of a 5-minute rest accompanied by one of the following activities: (a) control, (b) static stretching, or (c) PNF stretching. The hip flexion range of motion (ROM) was evaluated immediately before and after the activity. The MVC of knee flexion was then measured. Surface electromyography was recorded from the biceps femoris and vastus lateralis muscles during MVC tests and stretching. Although increases in ROM were significantly greater after PNF than after SS ($P < 0.01$), the decreases in MVC were similar between the two treatments. These results suggest that, although PNF stretching increases ROM more than static stretching, PNF stretching as well as static stretching is detrimental to isometric maximal strength.

PMID: 22395281 [PubMed - as supplied by publisher]

PNF/ROM

J Strength Cond Res. 2012 Apr;26(4):1045-51.

Efficacy of Two Different Stretch Training Programs (Passive vs. Proprioceptive Neuromuscular Facilitation) on Shoulder and Hip Range of Motion in Older People.

González-Ravé JM, Sánchez-Gómez A, Santos-García DJ.

Source

Sport Training Laboratory, Faculty of Sport Sciences, University of Castilla, La Mancha, Spain.

Abstract

ABSTRACT: González-Ravé, JM, Sánchez-Gómez, A, and Santos-García, DJ. Efficacy of 2 different stretch training programs (passive vs. proprioceptive neuromuscular facilitation) on shoulder and hip range of motion in older people. *J Strength Cond Res* 26(4): 1045-1051, 2012- The aim of this study was to determine the influence of 2 methods of stretch training (passive and proprioceptive neuromuscular facilitation [PNF]) on range of motion (ROM) in older people between the age of 60 and 70 years over a period of 13 weeks. Fifty-four participants (39 women and 15 men) were divided into 3 groups: passive (n = 17; 66.5 ± 6.5 years), PNF (n = 17; age, 64.7 ± 4.0 years old), and control (n = 17; age, 66.4 ± 4.5 years). The subjects trained 2 times per week on nonconsecutive days for 13 weeks. Each training session included 2 flexibility exercises focused on the shoulder and hip joints. The PNF group performed 6 seconds of passive stretching, 3 seconds of muscular contractions, and 2 seconds of relaxation. The passive group performed 10 seconds of stretching and 5 seconds of relaxation. This sequence was repeated 3 times by each group. The control group did not perform any stretching. In the PNF group, there was an increase in hip ROM ($p < 0.001$) between pretest and posttest in the passive group and an improvement ($p < 0.001$) was observed between pretest and posttest, whereas in the control group, there was a significant decrease ($p < 0.01$) in hip ROM between pretest and posttest. In shoulder ROM, there was an increase ($p < 0.001$) between pretest and posttest in the passive group and an improvement ($p < 0.001$) was observed between pretest and posttest in the PNF group. There were no changes in shoulder ROM between pretest and posttest in the control group. The analysis of variance showed significant differences in hip and shoulder ROM between passive and control groups and PNF and control groups, but no significant differences were found between passive and PNF. The main finding was that the ability of physically active older people to increase ROM in response to stretching techniques is similar for both passive and PNF techniques.

PMID: 22373895 [PubMed - in process]

Stretching

J Strength Cond Res. 2012 Feb 15. [Epub ahead of print]

Hip joint ROM improvements using 3 different interventions.

Moreside JM, McGill SM.

Source

1Post-doctoral fellow, Dalhousie University, Halifax, NS, Canada; 2Professor of Spine Biomechanics, University of Waterloo, Waterloo, ON, Canada.

Abstract

The purpose of this study was to analyze the effect of 3 different exercise interventions plus a control group on passive hip range of motion (ROM). Previous research studies into methods of improving passive hip mobility have focused on stretching protocols aimed specifically at the hip joint. The effect of core stabilization, motor training and myofascial stretching techniques on hip mobility in a selected asymptomatic group with limited hip mobility is unclear. In this study, twenty-four young men with limited hip mobility (< 50 percentile) were randomly assigned to 4 groups: stretching, stretching with motor control exercises for the hip and trunk, core endurance with motor control exercises, and a control group. Six week home exercise programs were individually prescribed based on assigned group, hip ROM, movement patterns and timed core endurance. Two way ANOVAs were conducted to analyze the effect of group assignment on hip ROM improvements. Both stretching groups demonstrated significant improvements in hip ROM ($p < 0.05$) attaining hip mobility levels at or above the 75th percentile, with rotation improving as much as 56%. The group receiving core endurance and motor control exercises with no stretching also demonstrated a moderate increase in ROM, but only significantly so in rotation. Average core endurance holding times improved 38 - 53%. These results indicate that stretches aimed at the myofascial components of the upper body, in addition to the hip joint, resulted in dramatic increases in hip ROM in a group of young males with limited hip mobility. Hip ROM also improved in the group that did no active stretching, highlighting the potential role of including stabilization or "proximal stiffening training" when rehabilitating the extremities.

PMID: 22344062 [PubMed - as supplied by publisher]

Core

J Strength Cond Res. 2012 Jan 3. [Epub ahead of print]

CORE MUSCLE ACTIVATION DURING DYNAMIC UPPER LIMB EXERCISES IN WOMEN.

Tarnanen SP, Siekkinen KM, Häkkinen AH, Mälkiä EA, Kautiainen HJ, Ylinen JJ.

Source

From the Department of Health Sciences, University of Jyväskylä, Jyväskylä, Finland (Tarnanen, Mälkiä, Häkkinen); LIKES Research Center for Sport and Health Sciences, Jyväskylä, Finland (Siekkinen); Unit of Family Practice, Central Finland Central Hospital, Jyväskylä, Finland (Kautiainen); Department of Physical Medicine and Rehabilitation, Central Finland Central Hospital, Jyväskylä, Finland (Häkkinen, Ylinen), Finland.

Abstract

Although several everyday functions and sporting activities demand controlled use of the abdominal and back muscles while working with the upper limbs, the activity of core muscles during dynamic upper limb exercises in the standing position has not been studied extensively. The purpose of this cross-sectional study was to examine abdominal and back muscle activity during dynamic upper limb exercises while standing and to evaluate whether dynamic exercises are appropriate for strengthening muscles. The activation of the rectus abdominis, obliquus externus abdominis, longissimus, and multifidus muscles during dynamic bilateral or unilateral shoulder exercises with or without fixation of the pelvis was measured in 20 healthy women using surface electromyography (EMG). Trunk muscle activation during isometric maximum contraction was used as a comparative reference. With bilateral shoulder extension and unilateral shoulder horizontal adduction, abdominal muscle activity was more than 60% of activity during reference exercises. With unilateral shoulder horizontal abduction and shoulder extension exercises, back muscle activity was more than 60% of the activity level reference exercise. Muscle activation levels were 35-64% lower during shoulder horizontal adduction and abduction without fixation compared to exercises with fixation. The results indicate that upper limb exercises performed in the standing position are effective for activating core muscles. Bilateral and unilateral shoulder extension and unilateral shoulder horizontal abduction and adduction with the pelvis fixed elicited the greatest activity of the core muscles.

PMID: 22222323 [PubMed - as supplied by publisher]

Stretching

J Strength Cond Res. 2011 Dec 8. [Epub ahead of print]

Kinematics Analyses Related to Stretch Shortening Cycle during Soccer Instep Kicking after Different Acute Stretching.

Amiri-Khorasani M, Mohammadkazemi R, Sarafrazi S, Riyahi-Malayeri S, Sotoodeh V.

Source

1Department of Sports Biomechanics, Faculty of Physical Education and Sports Science, Shahid Bahonar University of Kerman, Kerman, Iran; 2Faculty of entrepreneurship, University of Tehran, Tehran, Iran; 3Department of Motor Behavior, Faculty of Physical Education and Sports Science, Shahid Bahonar University of Kerman, Kerman, Iran; 4Department Physical Education and Sports Science, Islamic Azad University, East of Tehran Branch, Tehran, Iran; 5Department Physical Education and Sports Science, Islamic Azad University, Darab Branch, Darab, Iran.

Abstract

The purpose of this study was to examine the effects of static and dynamic stretching within a pre-exercise warm-up on angular velocity of knee joint, deepest knee flexion and duration of eccentric and concentric contraction which are relative to stretch shortening cycle during instep kicking in professional soccer players. The kicking motions of dominant legs were captured from 18 Olympic professional male soccer players (Height: 180.38, \pm 7.34 cm; Weight: 69.77, \pm 9.73 kg; Age: 19.22, \pm 1.83 years) using 4 digital video cameras at 50 Hz. There was significant difference in deepest knee flexion after the dynamic stretching (-3.22 ± 3.10 deg) versus static stretching (-0.18 ± 3.19 deg) relative to no stretching method with $p < 0.001$. Moreover, there was significant difference in eccentric duration after the dynamic stretching (0.006 ± 0.01 s) versus static stretching (-0.003 ± 0.01 s) relative to no stretching method with $p < 0.015$. There was significant difference in concentric duration after the dynamic stretching (-0.007 ± 0.01 s) versus static stretching (0.002 ± 0.01 s) relative to no stretching method with $p < 0.001$. There was also significant difference in knee angular velocity after the dynamic stretching (4.08 ± 3.81 rad/s) versus static stretching (-5.34 ± 4.40 rad/s) relative to no stretching method with $p < 0.001$. We concluded that dynamic stretching during warm-ups, as compared to static stretching, is probably most effective way as preparation for the kinematics characteristics of soccer instep kick which are relative to stretch shortening cycle

Manipulation

Reference: Bronfort G, Evans R, Anderson AV et al. Spinal Manipulation, Medication, or Home Exercise with Advice for Acute and Subacute Neck Pain: A Randomized Trial. *Annals of Internal Medicine* 2012; 156: 1-10.

Background:

Most manual medicine providers treat patients with neck pain on a daily basis. Historically, neck pain is treated differently among various health care providers: from passive manual therapy by chiropractors and osteopaths to medication by physicians and active exercise therapy by physiotherapists. Over recent years the lines between professionals is becoming blurred and many clinicians are incorporating various techniques in their practice. □□As evidence informed clinicians we want to make sure that the therapies we offer our patients provide the best chance of achieving positive outcomes, while providing efficient service in a timely and cost-effective manner. The most efficacious treatment for neck pain is still a source of controversy. Cochrane Collaboration reviews and other scientific research have recently questioned the effectiveness of commonly employed therapies such as injections, exercise, mobilization or manipulation for patients with neck pain. □□This study, widely discussed in the popular media, aimed to compare the effectiveness of three interventions for patients with acute and subacute neck pain: spinal manipulation therapy (SMT), medication, and home exercise with advice (HEA).

Pertinent Results:

Primary Outcome Measure – Participant-Rated Pain:

- This significantly favored SMT compared with medication at 12 weeks ($P \leq 0.01$) and in longitudinal analyses every 2 weeks from baseline to 12 weeks ($P = 0.017$). SMT was also superior to medication at 26 and 52 weeks.
- HEA was also effective. The differences in participant-rated pain between SMT and HEA were smaller than those between SMT and medication, and these differences were not statistically significant at any time point in the study. Further, there was no overall statistical difference noted between the HEA and medication groups throughout the course of the study.
- Long-term analyses for participant-rated pain mirrored the shorter-term results indicating that at 26 and 52 weeks, SMT was still favored over medication, but was not favored over HEA. As mentioned above, HEA was not favored over medication in this outcome compared to baseline.

Absolute Proportion of Patients with 50% or 75% Pain Reduction:

- At 12 weeks, a significantly higher proportion of patients in the SMT group experienced reductions of pain of at least 50% compared to the medication group. This was also noted at 26 weeks, but not 52 weeks.
- HEA was superior to medication at 12 and 26 weeks, with a higher proportion of subjects achieving a 75% pain reduction. This advantage was no longer apparent at 52 weeks, however.

Secondary Outcomes:

- Group differences in most secondary outcomes were similar to those of the primary outcomes.
- SMT was superior to medication in terms of global improvement, participant satisfaction and SF-36-assessed physical function.

Manipulation continued

- SMT and HEA groups performed similarly on most of the secondary outcomes, although SMT was better than HEA for satisfaction in short and long term.
- HEA was found to be better than medication in the short and long term for satisfaction.
- Cervical spine motion after 4 and 12 weeks was greatest in the HEA group. This was not elaborated any further in this study - results of the group differences in 3-dimensional cervical spine motion patterns will be reported in a future publication.

Adverse Reactions to Treatment: Adverse reaction rates were similar among all groups in this study, with the SMT and HEA groups reporting more musculoskeletal side-effects (40% and 46% respectively) and the medication group reporting more systemic side-effects (60%).

Clinical Application & Conclusions:

In this study SMT seemed more effective than medication according to various measures of neck pain and function. However, there were no demonstrated benefits of SMT over HEA, as subjects in both groups improved in similar manners on short- and long-term outcomes. Participants who received medication did not fare as well overall, but still improved. □□It should be noted that the strong performance of the HEA group has implications for the potential cost savings over both SMT and medication interventions. One might argue that the use of HEA is a cost effective approach, with arguably less potential for adverse reactions (although as mentioned above more subjects in the HEA group reported adverse reactions compared to the SMT group in this particular study). □□Another interesting finding was that participants in the medication group reported higher levels of medication use after the intervention. This is an important finding that clinicians should keep in the back of their mind when deciding on appropriate care for individual patients. □□It should be noted that the researchers did not delve in their findings from their secondary measures. They did mention that HEA provided greater improvements in cervical spine range of motion but stated that these results would be published elsewhere. □□The results of this study, like other trials on SMT for acute or subacute neck pain, suggest that SMT can provide reductions in pain and disability. Taking the existing body of literature into account, SMT and HEA both represent reasonable treatment options for managing acute and subacute mechanical neck pain. As always, clinical decisions should take studies like this into account, in conjunction with the preference of the patient, their response to prior treatment, and so on. □□When examining results from a study like this, simply looking at statistical significance may not suffice, as this may not necessarily provide the entire picture. Minimal Clinically Important Difference (MCID) is crucial parameter in determining the effectiveness of a given treatment. The MCID concept refers to the minimal change required on a particular outcome measure to confidently infer a meaningful clinical difference for the patient. This well-powered study might have produced statistically significant results, however it could be argued that the results do not suggest great clinical relevance. This issue has been raised in criticism of the positive press this study received. Readers should note that universally accepted MCID levels have not been established for many of the outcome measures utilized in this study.

Manipulation/headaches

Manual therapies for cervicogenic headache: a systematic review □ **The Journal of Headache and Pain, 04/03/2012**

Chaibi A et al. – The randomized clinical trials (RCTs) mostly included participant with infrequent cervicogenic headache (CEH). Future challenges regarding CEH are substantial both from a diagnostic and management point of view.

- This paper systematically reviewed randomized clinical trials (RCT) assessing the efficacy of manual therapies for cervicogenic headache (CEH).
- A total of seven RCTs were identified, i.e. one study applied physiotherapy ± temporomandibular mobilization techniques and six studies applied cervical spinal manipulative therapy (SMT).

The RCTs suggest that physiotherapy and SMT might be an effective treatment in the management of CEH, but the results are difficult to evaluate, since only one study included a control group that did not receive treatment.

Headache

Migraine and behavior in children: influence of maternal headache frequency □ **The Journal of Headache and Pain, 04/03/2012**

Arruda MA et al. – The burden of migraine to the family is complex. Children with migraine are more likely to have behavioral and emotional symptoms than children without migraine. Children without migraine may be affected, in turn, by frequent headaches experienced by their mothers.

Methods

- Authors took advantage of a large population study in order to measure child behavior, as captured by the Child Behavior Checklist (CBCL) as a function of headache status in the children and their mothers.
- Of the target sample, consents and analyzable data were obtained from 1,856 families (85.4 %).
- Headache diagnoses were defined according to the second edition of the International Classification of Headache Disorders, and behavioral and emotional symptoms were assessed by the validated Brazilian version of the CBCL.
- Authors calculated the relative risk of abnormalities in the CBCL domains as a function of headache status in the children, after adjusting by a series of main effect models.
- Children with migraine were more likely to present abnormal scores in several of the CBCL scales, relative to children without migraine, and maternal migraine status contributed little to the model.
- However, when the mother had daily headaches, both children with and without migraine had similar CBCL scores.

Results

- In multivariate analyses, migraine status in the children predicted CBCL scores ($p < 0.01$).

Headache status and headache frequency in the mother did not predict CBCL scores in children with migraine but predicted in children without migraine ($p < 0.01$).

LBP

Prognostic occupational factors for persistent low back pain in primary care □ *International Archives of Occupational & Environmental Health*, 04/03/2012

Melloh M et al. – In this study of patients with acute/subacute low back pain (LBP), 'resigned attitude towards the job' increased the likelihood of persistent LBP at 6 month. Addressing this factor with workplace interventions has the potential to modify the outcome. In patients experiencing 'social support at work', the development of persistent LBP was less likely and might therefore be considered as potential resource for prevention of persistent LBP.

Methods

- Prospective inception cohort study of patients attending a health practitioner for their first episode of acute/subacute or recurrent LBP.
- Patients were assessed at baseline addressing occupational, psychological, biomedical and demographic/lifestyle factors and followed up over 6 months.
- Multivariate logistic regression analysis was performed separately for the variables groups of the four different domains, controlling for age, gender and body mass index.
- The overall predictive value was calculated for the full regression models of the different domains.
- Finally, all significant variables from the different domains were combined into a final predictor model.

Results

- The final four–predictor model predicted 51 % of variance of persistent LBP and included 'resigned attitude towards the job' (OR 1.73; 95 % CI 1.16–2.59), 'social support at work' (OR 0.54; 95 % CI 0.32–0.90), 'functional limitation' (OR 1.05; 95 % CI 1.01–1.10) and 'duration of LBP' (OR 1.04; 95 % CI 1.02–1.06).

The accuracy of the model was 83 %, with 92 % of non–persistent and 67 % of persistent LBP patients correctly identified.

Evaluation of outcome measures for use in clinical practice for adults with musculoskeletal conditions of the knee: A systematic review

- [Tracey E. Howe](#), [Lesley J. Dawson](#) , [Grant Syme](#), [Louise Duncan](#), [Judith Reid](#)

Abstract

Background

This systematic review reported on the clinimetric properties of outcome measures for use in clinical practice for adults with musculoskeletal conditions of the knee.

Methods

A systematic search was performed in Medline, EMBASE, Cinahl and AMED to identify studies examining the clinimetric properties of outcome measures for adults undergoing conservative treatment of ligament injuries, meniscal lesions, patellofemoral pain and osteoarthritis of the knee. Outcome measures taking less than 20 min to administer and requiring minimal equipment and space were included. Pairs of authors used a checklist to record the characteristics of the outcome measures, their reported clinimetric properties and the demographics of the study populations. The OMERACT filters of 'truth' and 'discrimination' were applied to the data for each outcome measure by an expert panel.

Results

Forty-seven studies were included evaluating 37 outcome measures. Ten outcome measures had adequate supporting evidence for 'truth' and 'discrimination': AAOS, AKPS, goniometer measurement, IKDC, KOOS, LEFS, Lysholm, Tegner, WOMAC and WOMET. However none of the outcome measures had been comprehensively tested across all clinimetric properties.

Conclusion

Despite the widespread use of some outcome measures in clinical practice and primary research, data on the clinimetric properties were available for only 37 and of these only 10 had adequate supporting evidence for use in this population. However, before a core set of outcome measures can be recommended use in clinical practice, for adults with musculoskeletal conditions of the knee, consensus should be obtained on 'feasibility' in terms of burden on the clinician and the participant.

Keywords: [Outcome measures](#), [Clinimetric](#), [Knee](#), [Rehabilitation](#)

Manual Therapy

Volume 17, Issue 2 , Pages 119-125, April 2012

Self-reported pain severity, quality of life, disability, anxiety and depression in patients classified with 'nociceptive', 'peripheral neuropathic' and 'central sensitisation' pain. The discriminant validity of mechanisms-based classifications of low back (\pm leg) pain

- [Keith M. Smart](#) , [Catherine Blake](#), [Anthony Staines](#), [Catherine Doody](#)

Abstract

Evidence of validity is required to support the use of mechanisms-based classifications of pain clinically. The purpose of this study was to evaluate the discriminant validity of 'nociceptive' (NP), 'peripheral neuropathic' (PNP) and 'central sensitisation' (CSP) as mechanisms-based classifications of pain in patients with low back (\pm leg) pain by evaluating the extent to which patients classified in this way differ from one another according to health measures associated with various dimensions of pain.

This study employed a cross-sectional, between-subjects design. Four hundred and sixty-four patients with low back (\pm leg) pain were assessed using a standardised assessment protocol. Clinicians classified each patient's pain using a mechanisms-based classification approach. Patients completed a number of self-report measures associated with pain severity, health-related quality of life, functional disability, anxiety and depression. Discriminant validity was evaluated using a multivariate analysis of variance.

There was a statistically significant difference between pain classifications on the combined self-report measures, ($p = .001$; Pillai's Trace = .33; partial eta squared = .16). Patients classified with CSP ($n = 106$) reported significantly more severe pain, poorer general health-related quality of life, and greater levels of back pain-related disability, depression and anxiety compared to those classified with PNP ($n = 102$) and NP ($n = 256$). A similar pattern was found in patients with PNP compared to NP.

Mechanisms-based pain classifications may reflect meaningful differences in attributes underlying the multidimensionality of pain. Further studies are required to evaluate the construct and criterion validity of mechanisms-based classifications of musculoskeletal pain.

Keywords: [Nociceptive pain](#), [Peripheral neuropathic pain](#), [Central sensitisation](#), [Discriminant validity](#), [Classification](#)

LBP/Slump sitting

cManual Therapy

Volume 17, Issue 2 , Pages 157-163, April 2012

Differences in end-range lumbar flexion during slumped sitting and forward bending between low back pain subgroups and genders

- [Shannon L. Hoffman](#), [Molly B. Johnson](#), [Dequan Zou](#), [Linda R. Van Dillen](#)  

Abstract

Patterns of lumbar posture and motion are associated with low back pain (LBP). Research suggests LBP subgroups demonstrate different patterns during common tasks. This study assessed differences in end-range lumbar flexion during two tasks between two LBP subgroups classified according to the Movement System Impairment model. Additionally, the impact of gender differences on subgroup differences was assessed. Kinematic data were collected. Subjects in the Rotation (Rot) and Rotation with Extension (RotExt) LBP subgroups were asked to sit slumped and bend forward from standing. Lumbar end-range flexion was calculated. Subjects reported symptom behaviour during each test. Compared to the RotExt subgroup, the Rot subgroup demonstrated greater end-range lumbar flexion during slumped sitting and a trend towards greater end-range lumbar flexion with forward bending. Compared to females, males demonstrated greater end-range lumbar flexion during slumped sitting and forward bending. A greater proportion of people in the Rot subgroup reported symptoms with each test compared to the RotExt subgroup. Males and females were equally likely to report symptoms with each test. Gender differences were not responsible for LBP subgroup differences. Subgrouping people with LBP provides insight into differences in lumbar motion within the LBP population. Results suggesting potential consistent differences across flexion-related tasks support the presence of stereotypical movement patterns that are related to LBP.

LBP

Disabil Rehabil. 2012 Mar 30. [Epub ahead of print]

The relationship between pain, disability, quality of life and cognitive-behavioural factors in chronic back pain.

Scholich SL, Hallner D, Wittenberg RH, Hasenbring MI, Rusu AC.

Source

Department of Medical Psychology and Medical Sociology, Faculty of Medicine, Ruhr-University of Bochum , Bochum , Germany.

Abstract

Purpose: This pilot study systematically examined the correlations between the outcome variables pain intensity, disability and health-related quality of life (HRQOL) and between these outcomes and known psychological risk factors for chronic low back pain (CLBP), such as depression, trait anxiety, avoidance- and endurance-related pain responses at two different assessment points.

Method: Data from 52 CLBP inpatients treated in an orthopedic clinic were investigated at two points in time: during the first days after admission and 6 months after the termination of the inpatient treatment. Bivariate relationships between pain intensity, disability, HRQOL and psychological variables were examined with the help of Pearson product moment correlations. Furthermore, the differences that exist between correlations at baseline and follow-up were tested for significance. **Results:** Significant and large differences were found between the correlations with low correlations at baseline and high correlations at the follow-up. Furthermore, HRQOL showed a positive correlation with endurance-related and a negative correlation with avoidance-related pain responses. **Conclusions:** Focusing on a systematic comparison of two significant assessment time points in CLBP with an acute exacerbation at baseline, the results of this study underlined the recurrent course of LBP. The results highlight that the assessment time points play an important role in CLBP. [Box: see text].

PMID: 22458419 [PubMed - as supplied by publishe

Multifidus/Low back

Eur Spine J. 2012 Mar 31. [Epub ahead of print]

Fat infiltration in the lumbar multifidus and erector spinae muscles in subjects with sway-back posture.

Pezolato A, de Vasconcelos EE, Defino HL, Nogueira-Barbosa MH.

Source

Department of Biomechanics, Medicine and Rehabilitation of the Locomotor System of the Ribeirão Preto School of Medicine, University of São Paulo (USP), Ribeirão Preto, SP, Brazil, adrianop@usp.br.

Abstract

AIM:

Decreased activity of the lumbar stabilizer muscles has been identified in individuals with sway-back posture. Disuse can predispose these muscles to atrophy, which is characterized by a reduced cross-sectional area (CSA) and by fat infiltration. The aim of this study was to evaluate the amount of fat infiltration in the lumbar multifidus and lumbar erector spinae muscles as a sign of the muscle atrophy in individuals with sway-back posture, with and without low back pain.

MATERIALS AND METHODS:

Forty-five sedentary individuals between 16 and 40 years old participated in this study. The sample was divided into three groups: symptomatic sway-back (SSBG) (n = 15), asymptomatic sway-back (ASBG) (n = 15), and control (CG) (n = 15). The individuals were first subjected to photographic analysis to classify their postures and were then referred for a magnetic resonance imaging (MRI) examination of the lumbar spine. The total (TCSA) and functional (FCSA) cross-sectional areas of the lumbar erector spinae together with lumbar multifidus and isolated lumbar multifidus muscles were measured from L1 to S1. The amount of fat infiltration was estimated as the difference between the TCSA and the FCSA.

RESULTS:

Greater fat deposition was observed in the lumbar erector spinae and lumbar multifidus muscles of the individuals in the sway-back posture groups than in the control group. Pain may have contributed to the difference in the amount of fat observed in the groups with the same postural deviation. Similarly, sway-back posture may have contributed to the tissue substitution relative to the control group independently of low back pain.

CONCLUSIONS:

The results of this study indicate that individuals with sway-back posture may be susceptible to morphological changes in their lumbar erector spinae and lumbar multifidus muscles, both due to the presence of pain and as a consequence of their habitual posture.

PMID: 22465969 [PubMed - as supplied by publisher]

LBP

Are “Patterns” of Lumbar Disc Degeneration Associated With Low Back Pain?: New Insights Based on Skipped Level Disc Pathology □ *Spine*, 04/03/2012 **Clinical Article**

Cheung KMC et al. – The large-scale study is the first to describe novel variants of skipped level disc degeneration (SLDD) types and their clinical relevance. More important, low back pain (LBP) and severity of pain were more pronounced in individuals with contiguous, multilevel disc degeneration (CMDD) rather than those with SLDD. The study suggests that subjects with a similar degree but different patterns of multilevel disc degeneration do differ with respect to low back symptoms. This finding may provide new evidence with regard to the mechanism of LBP.

Study Design. A cross-sectional, population-based cohort study.

Objective. The objective of this study was to evaluate the clinical relevance of skipped level disc degeneration (SLDD) to that of contiguous, multilevel disc degeneration (CMDD) of the lumbar spine. The study also aimed to identify patterns of SLDD, its classification, prevalence, and clinical relevance.

Summary of Background Data. The association of disc degeneration on magnetic resonance imaging with low back pain (LBP) remains questionable. The occurrence of SLDD of the lumbar spine has recently been noted. To date, patterns of disc degeneration have been overlooked in the association with low back symptoms.

Methods. A population-based radiographic and clinical study of 3099 Southern Chinese patients. Individuals with multilevel disc degeneration of the lumbar spine on sagittal T2-weighted magnetic resonance imaging (N = 1457) were stratified to SLDD (n = 301; 20.7%) or CMDD (n = 1156; 79.3%) groups. SLDD was further classified into 5 types by the relative location of nondegenerated normal disc(s) to degenerated disc levels. Subject demographics, presence of LBP, pain intensity, and functional disability were assessed.

Results. In the multivariate analyses, CMDD increased the likelihood of historical LBP (odds ratio [OR]: 1.39; 95% confidence interval [CI]: 1.00–1.93; $P = 0.047$) and pain severity (OR: 1.83; 95% CI: 1.23–2.73; $P = 0.003$) in comparison with SLDD. A significant increasing trend of number of levels with disc degeneration, overall disc degeneration severity, and presence of disc bulges/extrusions was noted from SLDD type I (least severe) to SLDD type V (most severe) ($P < 0.05$). A higher prevalence of LBP and a higher pain intensity were observed in SLDD classification type V. Functional disability scores did not differ between CMDD and SLDD, nor within SLDD classification types ($P > 0.05$).

Conclusion. Our large-scale study is the first to describe novel variants of SLDD types and their clinical relevance. More important, LBP and severity of pain were more pronounced in individuals with CMDD rather than those with SLDD. Our study suggests that subjects with a similar degree but different patterns of multilevel disc degeneration do differ with respect to low back symptoms. This finding may provide new evidence with regard to the mechanism of LBP.

Ankle

Effectiveness of proprioceptive exercises for ankle ligament injury in adults: A systematic literature and meta-analysis □ *Manual Therapy*, 04/03/2012 **Evidence Based Medicine**

Postle K et al. – There was no consensus on the advantages of including proprioceptive training in the rehabilitation of this population for swelling, postural sway, joint position sense, ankle range of motion or return to sport outcomes. Further study is warranted to develop the rigour of the evidence-base and to determine the optimal proprioceptive training programme following ankle ligament injury with different populations.

The purpose of this study was to assess the effectiveness of such proprioceptive exercise following ankle ligament injury. A systematic review of the databases MEDLINE, EMBASE, CINAHL, AMED, the Cochrane library database and the PEDro database, in addition to unpublished literature databases was conducted to July 2011. When appropriate, meta-analysis was conducted to pool results from homogeneous studies. The methodological quality of the literature was reviewed using the Critical Appraisal Skills Programme tool. The results indicated that there is no statistically significant difference in recurrent injury between the addition of proprioceptive exercises during the rehabilitation of patients following ankle ligament injury ($p = 0.68$). The addition of proprioceptive training demonstrated a significant reduction in subjective instability and functional outcomes ($p < 0.05$). There was no consensus on the advantages of including proprioceptive training in the rehabilitation of this population for swelling, postural sway, joint position sense, ankle range of motion or return to sport outcomes. Further study is warranted to develop the rigour of the evidence-base and to determine the optimal proprioceptive training programme following ankle ligament injury with different populations.

Keywords: [Talocrucial](#), [Sprain](#), [Joint position sense](#), [Kinaesthesia](#)

LBP

School childrens backpacks, back pain and back pathologies □BMJ - Archives of Diseases in Childhood, 04/04/2012

Rodríguez-Oviedo P et al. – Carrying backpacks increases the risk of back pain and possibly the risk of back pathology. The prevalence of school children carrying heavy backpacks is extremely high. Preventive and educational activities should be implemented in this age group.

Objective To investigate whether backpack weight is associated with back pain and back pathology in school children.

Design Cross-sectional study.

Setting Schools in Northern Galicia, Spain.

Patients All children aged 12–17.

Interventions Backpack weight along with body mass index, age and gender.

Main outcome measures Back pain and back pathology.

Results 1403 school children were analysed. Of these, 61.4% had backpacks exceeding 10% of their body weight. Those carrying the heaviest backpacks had a 50% higher risk of back pain (OR 1.50 CI 95% 1.06 to 2.12) and a 42% higher risk of back pathology, although this last result was not statistically significant (OR 1.42 CI 95% 0.86 to 2.32). Girls presented a higher risk of back pain compared with boys.

Conclusions Carrying backpacks increases the risk of back pain and possibly the risk of back pathology. The prevalence of school children carrying heavy backpacks is extremely high. Preventive and educational activities should be implemented in this age group.

Factors affecting shoulder–pelvic integration during axial trunk rotation in subjects with recurrent low back pain □ *European Spine Journal*, 04/04/2012

Park WS et al. – The results indicated a different pattern of trunk rotation movement with the age and BMI serving as important factors to consider for recurrent low back pain (LBP). The results of this study also indicated a different pattern of shoulder and pelvic coordination with age and gender. Clinicians need to consider the consequences of limited shoulder–pelvic rotational angles, especially limited rotational angle on the pelvis during trunk axial rotation.

Shoulder–pelvic integration could play a central role in the control of dynamic posture and movement. However, kinematic coordination during axial trunk rotation has not been carefully investigated in subjects with recurrent low back pain (LBP). The purpose of this study was to compare the maximum rotational angles of the shoulders and pelvis in the transverse plane between subjects with and without recurrent LBP.

Materials and methods

A total of 38 age-matched subjects (19 control subjects: 69.00 ± 5.75 years old and 19 subjects with LBP: 68.79 ± 5.40 years old) participated in the study. The axial trunk rotation test was conducted in the upright position with bilateral hips and knees fully extended and both feet shoulder width apart.

Results

The results of this study indicated that there was a difference in pelvic girdle rotation between groups (100.79 ± 26.46 in the control group, 82.12 ± 23.16 in the LBP group; $t = 2.31$, $p = 0.02$); however, there was no difference for the shoulder girdle (177.63 ± 36.98 in the control group, 156.42 ± 30.09 in the LBP group; $t = 1.91$, $p = 0.06$). There were interactions with age ($F = 9.27$, $p = 0.004$) and BMI ($F = 7.50$, $p = 0.01$) with the rotational angles of the shoulder and pelvis.

Conclusion

These results indicated a different pattern of trunk rotation movement with the age and BMI serving as important factors to consider for recurrent LBP. The results of our study also indicated a different pattern of shoulder and pelvic coordination with age and gender. Clinicians need to consider the consequences of limited shoulder–pelvic rotational angles, especially limited rotational angle on the pelvis during trunk axial rotation. Further studies are required to determine the causes of the underlying problems for clinical decision-making and altered shoulder–pelvic rotation in subjects with recurrent LBP.

LBP

Arch Phys Med Rehabil. 2012 Apr;93(4):690-5.

Recurrence of radicular pain or back pain after nonsurgical treatment of symptomatic lumbar disk herniation.

Suri P, Rainville J, Hunter DJ, Li L, Katz JN.

Source

Veterans Affairs Boston Healthcare System, Boston, MA; Spaulding Rehabilitation Hospital, Boston, MA; New England Baptist Hospital, Boston, MA; Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, MA.

Abstract

Suri P, Rainville J, Hunter DJ, Li L, Katz JN. Recurrence of radicular pain or back pain after nonsurgical treatment of symptomatic lumbar disk herniation.

OBJECTIVES:

To determine recurrence rates of lower-extremity radicular pain after nonsurgical treatment of acute symptomatic lumbar disk herniation (LDH), and to identify predictors of recurrence.

DESIGN:

Prospective inception cohort.

SETTING:

Outpatient spine clinic.

PARTICIPANTS:

Patients (N=79) reporting resolution of radicular pain after magnetic resonance imaging confirmation of LDH.

INTERVENTIONS:

Individualized nonsurgical treatment tailored to the patient. All patients received education, but other treatments varied depending on the individual.

MAIN OUTCOME MEASURES:

Resolution of radicular pain was defined as a pain-free period of ≥ 1 month. Patients who reported resolution of radicular pain within 1 year after seeking care for acute LDH were asked whether pain had recurred at 1 year after seeking care and were also reassessed 1 year after the time of resolution of radicular pain and 2 years after seeking care. Patients reported on recurrence and the date of recurrence, if any. We evaluated the 1-year incidence of recurrence, using Kaplan-Meier survival plots. We examined predictors of recurrence using bivariate and multivariate Cox proportional hazards models. We examined the secondary outcome of back pain recurrence using identical methods.

RESULTS:

Twenty-five percent (95% confidence interval [CI], 15-35) of individuals with resolution of radicular pain for at least 1 month reported subsequent recurrence of pain within 1 year after resolution. The only factor independently associated with radicular pain recurrence was the number of months prior to resolution of pain (hazard ratio per month=1.24; 95% CI, 1.13-1.37; $P<.001$). The 1-year incidence of back pain recurrence was 43% (95% CI, 30-56), and older age decreased the hazard of recurrence.

CONCLUSIONS:

Recurrence of radicular pain is relatively common after nonsurgical treatment of LDH and is predicted by longer time to initial resolution of pain.

LBP

Pain relief is associated with decreasing postural sway in patients with non-specific low back pain *Full Text* [□BMC Musculoskeletal Disorders, 04/05/2012](#) **Clinical Article**

Ruhe A et al. – Alterations in self-reported pain intensities are closely related to changes in postural sway. The previously reported linear relationship between the two variables is maintained as pain levels change. Pain interference appears responsible for the altered sway in pain sufferers. This underlines the clinical use of sway measures as an objective monitoring tool during treatment or rehabilitation.

Methods

- Thirty-eight patients with non-specific low back pain and a matching number of healthy controls were enrolled.
- Postural sway was measured by three identical static bipedal standing tasks of 90 sec duration with eyes closed in narrow stance on a firm surface.
- The perceived pain intensity was assessed by a numeric rating scale (NRS-11).
- The patients received three manual interventions (e.g. manipulation, mobilization or soft tissue techniques) at 3-4 day intervals, postural sway measures were obtained at each occasion.

Results

- A clinically relevant decrease of four NRS scores is associated with manual interventions correlated with a significant decrease in postural sway.
- In contrast, if no clinically relevant change in intensity occurred ([less than or equal to]1 level), postural sway remained similar compared to baseline.

The postural sway measures obtained at follow-up sessions 2 and 3 associated with specific NRS level showed no significant differences compared to reference values for the same pain score.

Gait/Knee

Gait metric profile of 157 patients suffering from anterior knee pain. A controlled study

□ **The Knee, 04/06/2012**

Assa T et al. – Significant differences were found between the spatiotemporal gait profile of anterior knee pain (AKP) patients and symptom-free matched controls. In addition, an association was found between subjective disease severity and gait abnormalities. These findings suggest the usefulness of gait parameters, alongside with the use of self-evaluation questionnaires, in identifying deviations of these patients from healthy population.

Purpose

Gait metric alterations have been previously reported in patients suffering from anterior knee pain (AKP). Characterization of simple and measurable gait parameters in these patients may be valuable for assessing disease severity as well as for follow-up. Previous gait studies in this population have been comprised of relatively small cohorts and the findings of these studies are not uniform. The objective of the present study was to examine spatio-temporal gait parameters in patients with AKP in comparison to symptom-free controls. Furthermore, the study aimed to examine the relationship between self-reported disease severity and the magnitude of gait abnormalities.

Methods

157 patients with AKP were identified and compared to 31 healthy controls. Patients were evaluated with a spatiotemporal gait analysis via a computerized mat, the Western Ontario and McMaster Osteoarthritis Index (WOMAC) questionnaire and the Short Form (SF)-36 health surveys.

Results

AKP patients walked with significantly lower velocity (15.9%) and cadence (5.9%), shorter step length (9.5%), stride length (9.6%), and showed significant differences in all gait cycle phases ($P < 0.05$ for all). Study group reported higher levels of pain (96%), functional limitation (94%), and poorer perception of mental quality of life (30%) ($P < 0.05$ for all).

Conclusion

Significant differences were found between the spatiotemporal gait profile of AKP patients and symptom-free matched controls. In addition, an association was found between subjective disease severity and gait abnormalities. These findings suggest the usefulness of gait parameters, alongside with the use of self-evaluation questionnaires, in identifying deviations of these patients from healthy population.

Massage

Clin J Oncol Nurs. 2012 Apr 1;16(2):121-4.

Effect of massage therapy for postsurgical mastectomy recipients.

Drackley NL, Degnim AC, Jakub JW, Cutshall SM, Thomley BS, Brodt JK, Vanderlei LK, Case JK, Bungum LD, Cha SS, Bauer BA, Boughey JC.

Source

Complementary and Integrative Medicine Program.

Abstract

This quality improvement pilot study evaluated the effect of massage therapy on pain, anxiety, and overall well-being in women who received mastectomies at a busy hospital practice. Participants reported a significant reduction in pain, stress, and muscle tension, as well as an increase in relaxation. Oncology nurses should consider the feasibility of massage therapy as a valuable nonpharmacologic pain management strategy.

PMID: 22459520 [PubMed - in process]

Posture/LBP

J Bodyw Mov Ther. 2012 Apr;16(2):236-43. Epub 2011 Aug 31.

Effect of flexibility exercise on lumbar angle: A study among non-specific low back pain patients.

Purepong N, Jitvimonrat A, Boonyong S, Thaveeratitham P, Pensri P.

Source

Department of Physical Therapy, Faculty of Allied Health Sciences, Chulalongkorn University, Chulapat 2 Bld., Soi Chula 12, Phayathai Road, Pathumwan, Bangkok, 10330, Thailand.

Abstract

The study investigated the influence of lumbar flexibility exercise on the lumbar angle among patients with non-specific low back pain (LBP). Pre-experimental one-group pretest-posttest design trial was conducted at Health Service Center, Chulalongkorn University, Thailand. Thirty-five non-specific LBP patients with limitation in lower back range of motion and without neurological deficits were recruited (based on the LBP guidelines by RCGP 1999). Lumbar flexibility exercise program developed based on McKenzie therapy was performed individually each day for 2 weeks. Patients attended an exercise program daily in the first week under the supervision of a physiotherapist. The exercise program consisted of 7 sets a day (3-2-2 in the morning-afternoon-evening) in series of 10 repetitions for each set for 2 weeks. Lumbar angle was measured at the beginning and at the end of 2 weeks in order to determine the range of motion improved. The results indicated that the low back pain symptom improved as well as the angle.

Copyright © 2011 Elsevier Ltd. All rights reserved.

PMID: 22464123 [PubMed - in process]

Pain

The effects of music intervention in the management of chronic pain: a single-blind, randomized, controlled trial □ *The Clinical Journal of Pain*, 04/10/2012

Guétin S et al. – These results confirm the value of music intervention to the management of chronic pain and anxiety/depression. This music intervention method appears to be useful in managing chronic pain as it enables a significant reduction in the consumption of medication.

Methods

- A controlled, single-blind, randomized trial was used.
- 87 patients presenting with lumbar pain, fibromyalgia, inflammatory disease, or neurological disease were included in the study.
- During their hospitalization, the intervention arm (n=44) received at least 2 daily sessions of music listening between D0 and D10, associated with their standard treatment, and then pursued the music intervention at home until D60 using a multimedia player in which the music listening software program had been installed.
- The control arm received standard treatment only (n=43).
- The end points measured at D0, D10, D60, and D90 were: pain (VAS), anxiety–depression (HAD) and the consumption of medication.

Results

- At D60 in the music intervention arm, this technique enabled a more significant reduction ($P < 0.001$) in pain (6.3 ± 1.7 at D0 vs. 3 ± 1.7 at D60) when compared with the arm without music intervention (6.2 ± 1.5 at D0 vs. 4.6 ± 1.7 at D60).
- In addition, music intervention contributed to significantly reducing both anxiety/depression and the consumption of anxiolytic agents.

LBP

J Back Musculoskelet Rehabil. 2011 Jan 1;24(4):241-9.

The effect of lumbar extension training with and without pelvic stabilization on lumbar strength and low back pain.

Smith D, Bissell G, Bruce-Low S, Wakefield C.

Source

Department of Exercise and Sport Science, Manchester Metropolitan University, Crewe Green Road, Crewe, Cheshire, UK. d.d.smith@mmu.ac.uk

Abstract

INTRODUCTION:

A dynamometer employing a stabilization procedure (lumbar extension machine, MedX, Ocala, FL) is effective in improving strength and reducing symptoms of low back pain (LBP), and researchers have hypothesized that this effectiveness is due to the pelvic stabilization. However, effects of the dynamometer with and without pelvic stabilization on LBP have not been compared: This was the aim of the present study.

METHODS:

Forty-two chronic LBP patients were randomly assigned to a lumbar extension training with pelvic stabilization group (STAB; n=15), a lumbar extension without pelvic stabilization group (NO-STAB; n=15) and a control group (n=12). STAB and NO-STAB participants completed one weekly session of dynamic variable resistance exercise (one set of 8-12 repetitions to fatigue) on the lumbar extension machine (with or without pelvic stabilization) for 12 weeks. Pre- and post-test measures of self-reported LBP (101-point visual analog scale; pre-test mean of 25), related disability (Oswestry disability index; pre-test mean of 34) and lumbar strength were taken.

RESULTS:

After the exercise program, the STAB group increased significantly in lumbar strength at all joint angles, and decreased significantly in visual analogue and Oswestry scores. However, there were no significant changes in these variables in the NO-STAB and control groups.

DISCUSSION:

Isolated lumbar extension exercise is very effective in reducing LBP in chronic patients. However, when the pelvis is not stabilized, otherwise identical exercises appear ineffective in reducing LBP

Foot

J Back Musculoskelet Rehabil. 2011 Jan 1;24(4):225-31.

Effect of foot orthoses and short-foot exercise on the cross-sectional area of the abductor hallucis muscle in subjects with pes planus: a randomized controlled trial.

Jung DY, Koh EK, Kwon OY.

Source

Department of Physical Therapy, College of Tourism & Health, Joongbu University, Geumsan, Republic of Korea.

Abstract

OBJECTIVE:

To prevent overuse injuries related to excessively pronated feet, the strengthening of the foot intrinsic muscles has been recommended. The purpose of this study was to examine the effects of foot orthoses and a short-foot exercise intervention on the cross-sectional area (CSA) of the abductor hallucis (AbdH) muscle and strength of the flexor hallucis (FH) in subjects with pes planus.

METHODS:

Twenty-eight subjects with pes planus were randomly assigned to the foot orthosis (FO) group or the combined foot orthosis and short-foot exercise (FOSF) group for an 8-week intervention. The CSA of the AbdH muscle and the strength of FH were assessed before and after intervention. Data were analyzed using a mixed-model ANOVA.

RESULTS:

Significant group by intervention interaction effects were observed in CSA of the AbdH ($p=0.009$) and strength of the FH ($p=0.015$). The results of the post hoc paired t-test showed that the CSA of the AbdH muscle and the strength of the FH significantly increased after the intervention in both groups ($p=0.000$). The mean CSA of the AbdH muscle and the strength of FH were significantly greater in subjects in the FOSF group compared with subjects in the FO group (mean difference of FO vs. FOSF=13.61 mm²) in CSA of AbdH muscle; 0.90 kgf in strength of FH; $p=0.008$).

CONCLUSIONS:

Results from this study demonstrate that foot orthoses combined with short-foot exercise is more effective in increasing the CSA of the AbdH muscle and the strength of FH compared with foot orthoses alone. Therefore, foot orthoses combined with short-foot exercise are recommended for improving strength of AbdH muscle in subjects with pes planus

Red flags

J Electromyogr Kinesiol. 2012 Apr 5. [Epub ahead of print]

Vertebral artery strains during high-speed, low amplitude cervical spinal manipulation.

Herzog W, Leonard TR, Symons B, Tang C, Wuest S.

Source

Faculty of Kinesiology, University of Calgary, Calgary, Canada.

Abstract

Spinal manipulative therapy (SMT) has been recognized as an effective treatment modality for many back, neck and musculoskeletal problems. One of the major issues of the use of SMT is its safety, especially with regards to neck manipulation and the risk of stroke. The vast majority of these accidents involve the vertebro-basilar system, specifically the vertebral artery (VA) between C2/C1. However, the mechanics of this region of the VA during SMT are unexplored. Here, we present first ever data on the mechanics of this region during cervical SMT performed by clinicians. VA strains obtained during SMT are significantly smaller than those obtained during diagnostic and range of motion testing, and are much smaller than failure strains. We conclude from this work that cervical SMT performed by trained clinicians does not appear to place undue strain on VA, and thus does not seem to be a factor in vertebro-basilar injuries.

Crown Copyright © 2012. Published by Elsevier Ltd. All rights reserved.

PMID: 22483611 [PubMed - as supplied by publishe

Stretching/MI

J Strength Cond Res. 2012 Apr 3. [Epub ahead of print]

The effect of motor imagery and static stretching on anaerobic performance in trained cyclists.

Kingsley JD, Zakrajsek RA, Nesser TW, Gage MJ.

Source

aDepartment of Kinesiology, Recreation and Sport, b Department of Applied Medicine and Rehabilitation, Indiana State University, Terre Haute, IN 47809; c Department of Kinesiology, Recreation and Sport Studies, University of Tennessee, TN 37996.

Abstract

Athletes perform many different protocols as part of their warm-up routine prior to competition. Stretching has been suggested to decrease force and power production while motor imagery (MI), the visualization of simple or complex motor activities in the absence of physical movement, may increase force and power production in young healthy individuals. Few studies have investigated either of these in trained individuals. No studies have compared the effects of static stretching (SS) to MI on anaerobic performance in trained cyclists. The purpose of the present study was to examine the effects of SS compared to MI and quiet rest (QR) on anaerobic performance in trained cyclists. Thirteen trained cyclists (9 males: 4 females; aged 21 ± 2 yrs) were assessed for height (1.76 ± 0.07 m), weight (73.4 ± 13 kg), % body fat ($10.8 \pm 6.2\%$) and maximal oxygen consumption (VO_{2max} of 42.0 ± 5.6 ml/kg/min) on a cycle ergometer. Participants performed 3 randomized sessions consisting of cycling for 30 minutes at 65% of VO_{2max} before undergoing 16 minutes of SS, MI or QR followed by an anaerobic performance test. SS consisted of 3 sets of 30-second stretches of the hamstrings, quadriceps, hip flexors and piriformis. Imagery was based on the physical, environmental, task, learning, emotion, and perspective (PETTLEP) approach and was conducted by a trained technician. Both relative and absolute powers, as well as peak rpm, were quantified using the Wingate anaerobic threshold test. No significant interactions existed among SS, MI and QR for relative peak power, absolute peak power or peak RPM. In disagreement with current literature, the present study suggests that neither SS nor a single session of MI immediately affect anaerobic performance in trained cyclists. If an event is less than 30 seconds then SS or MI may not affect performance.

PMID: 22476165 [PubMed - as supplied by publisher]

Stretching

Muscle Nerve. 2012 Mar;45(3):367-75. doi: 10.1002/mus.22286.

Preserving sarcomere number after tenotomy requires stretch and contraction.

Van Dyke JM, Bain JL, Riley DA.

Source

Department of Cell Biology, Neurobiology & Anatomy, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, Wisconsin 53226, USA.

Abstract

INTRODUCTION:

Passive stretch therapy is utilized to improve the range of motion of chronically shortened muscles. However, human studies show conflicting results as whether passive stretch is clinically effective.

METHODS:

The soleus muscles of adult rats were tenotomized to induce muscle shortening adaptation. Muscles included were non-treated normal, subjected to daily static stretch, or lengthened and isometrically contracted for 20 min/day. Muscle fiber structure was analyzed histochemically. Sarcomeres per millimeter length were counted to assess the effect of treatment.

RESULTS:

Passive stretch significantly reduced central core lesion formation, but sarcomere loss was not prevented. The addition of isometric contraction during static stretch significantly ($P < 0.001$) reduced sarcomere loss.

CONCLUSIONS:

Passive stretch alone does not prevent shortening adaptation. Contraction is required in combination with stretch to preserve the number of sarcomeres in series. The combination of stretch and contraction is necessary to maintain proper muscle fiber length.

Copyright © 2011 Wiley Periodicals, Inc.

PMID: 22334171 [PubMed - indexed for MEDLINE]

Posture

Spinal Position Sense and Trunk Muscle Activity During Sitting and Standing in Nonspecific Chronic Low Back Pain: Classification Analysis □ *Spine*, 04/18/2012

Sheeran L et al. – Subgroups of nonspecific chronic low back pain (NSCLBP) had similar neutral spinal position deficits regarding error magnitude and variability, but subclassification revealed clear subgroup differences in the direction of the deficit. The trunk muscle activation was shown to be largely nondiscriminatory between subgroups, with the exception of superficial lumbar multifidus.

Objective. To investigate NSCLBP subgroup differences in spinal position sense and trunk muscle activity when repositioning thoracic and lumbar spine into neutral (midrange) spinal position during sitting and standing.

Summary of Background Data. Patients with NSCLBP report aggravation of symptoms during sitting and standing. Impaired motor control in NSCLBP, associated with sitting and standing postures nearer the end range of spinal motion, may be a contributing factor. Rehabilitation improving neutral (midrange) spinal position control is advocated. Postural and motor control alterations vary in different NSCLBP subgroups, potentially requiring specific postural interventions. There is limited evidence on whether subgroup differences exist when performing neutral spine position tasks.

Methods. Ninety patients with NSCLBP and 35 asymptomatic controls were recruited. Two blinded practitioners classified NSCLBP into subgroups of active extension pattern and flexion pattern. Participants were assisted into neutral spine position and asked to reproduce this position 4 times. Absolute, variable, and constant errors were calculated. Three-dimensional thoracic and lumbar kinematics quantified the repositioning accuracy and surface electromyography assessed back and abdominal muscles activity bilaterally.

Results. Irrespective of subclassification, patients with NSCLBP produced significantly greater error magnitude and variability than the asymptomatic controls, but subgroup differences were detected in the error direction. Subgroup differences in the trunk muscle activity were not consistently identified. Although both subgroups produced significantly higher abdominal activity, subclassification revealed difference in superficial multifidus activity during standing, with flexion pattern producing significantly greater activity than the asymptomatic controls.

Conclusion. Subgroups of NSCLBP had similar neutral spinal position deficits regarding error magnitude and variability, but subclassification revealed clear subgroup differences in the direction of the deficit. The trunk muscle activation was shown to be largely nondiscriminatory between subgroups, with the exception of superficial lumbar multifidus.

Sitting

Ergonomics. 2012 Apr 16. [Epub ahead of print]

The effect of dynamic sitting on the prevention and management of low back pain and low back discomfort: a systematic review.

O'Sullivan K, O'Keeffe M, O'Sullivan L, O'Sullivan P, Dankaerts W.

Source

a Department of Clinical Therapies , University of Limerick , Limerick , Ireland.

Abstract

Dynamic sitting has been proposed to reduce low back pain (LBP) and/or low back discomfort (LBD) while sitting. This is supported by studies suggesting that subjects with LBP assume more static, sustained postures while sitting. This systematic review investigated the effect of dynamic sitting on LBP among subjects with LBP and the development of LBD among pain-free subjects. Electronic databases were searched by two independent assessors. All prospective studies which compared the effect of a dynamic sitting condition on LBP or LBD to another sitting condition were eligible, with no minimum follow-up period applied. The quality of the included studies was assessed using the PEDro scale. Seven high-quality studies were eligible, including five crossover studies and two randomised controlled trials. The results suggest there is currently no evidence to support the use of dynamic sitting as a stand-alone approach in the management of LBP.

Practitioner Summary: This systematic review investigated the effect of dynamic sitting on LBP or LBD. Seven high-quality studies met the inclusion and exclusion criteria. Overall, the evidence suggests that dynamic sitting approaches are not effective as a stand-alone management approach for LBP.

PMID: 22506694 [PubMed – as supplied by publisher]

LBP/Posture

Postural Function of the Diaphragm in Persons With and Without Chronic Low Back Pain
Pavel Kolar, Jan Sulc, Martin Kyncl, Jan Sanda, Ondrej Cakrt, Ross Andel, Kathryn Kumagai,
Alena Kobesova
DOI: 10.2519/jospt.2012.3830

STUDY DESIGN: A case-control study.

OBJECTIVES: To examine the function of the diaphragm during postural limb activities in patients with chronic low back pain and healthy controls.

BACKGROUND: Abnormal stabilizing function of the diaphragm may be an etiological factor in spinal disorders. However, a study designed specifically to test the dynamics of the diaphragm in chronic spinal disorders is lacking.

METHODS: Eighteen patients with chronic low back pain due to chronic overloading, as ascertained via clinical assessment and magnetic resonance imaging, and 29 healthy subjects were examined. Both groups presented with normal pulmonary function test results. A dynamic magnetic resonance imaging system and specialized spirometric readings were used with subjects in the supine position. Measurements during tidal breathing (TB) and isometric flexion of the upper and lower extremities against external resistance with TB were performed. Standard pulmonary function tests, including respiratory muscle drive (P_Imax and P_Emax), were also assessed.

RESULTS: Using multivariate analysis of covariance, smaller diaphragm excursions and higher diaphragm position were found in the patient group ($P < .05$) during the upper extremity TB and lower extremity TB conditions. Maximum changes were found in costal and middle points of the diaphragm. A 1-way analysis of covariance showed a steeper slope in the middle-posterior diaphragm in the patient group both in the upper extremity TB and lower extremity TB conditions ($P < .05$).

CONCLUSION: Patients with chronic low back pain appear to have both abnormal position and a steeper slope of the diaphragm, which may contribute to the etiology of the disorder.

J Orthop Sports Phys Ther 2012;42(4):352-362, Epub 21 December 2011.

doi:10.2519/jospt.2012.3830

KEY WORDS: dynamic magnetic resonance imaging, lung function, spinal disorders, stabilizing function, thorax

The authors examine the function of the diaphragm during postural limb activities in patients with chronic low back pain and healthy controls.

Achilles Tendon

Br J Sports Med. 2012 Mar;46(3):214-8. Epub 2011 Nov 10.

A 5-year follow-up study of Alfredson's heel-drop exercise programme in chronic midportion Achilles tendinopathy.

van der Plas A, de Jonge S, de Vos RJ, van der Heide HJ, Verhaar JA, Weir A, Tol JL.

Source

Sports Medicine Department, The Hague Medical Centre Antoniushove, Burgemeester Banninglaan 1, Leidschendam, The Netherlands.

Abstract

BACKGROUND:

Eccentric exercises have the most evidence in conservative treatment of midportion Achilles tendinopathy. Although short-term studies show significant improvement, little is known of the long-term (>3 years) results.

AIM:

To evaluate the 5-year outcome of patients with chronic midportion Achilles tendinopathy treated with the classical Alfredson's heel-drop exercise programme.

STUDY DESIGN:

Part of a 5-year follow-up of a previously conducted randomised controlled trial. Methods 58 patients (70 tendons) were approached 5 years after the start of the heel-drop exercise programme according to Alfredson. At baseline and at 5-year follow-up, the validated Victorian Institute of Sports Assessment-Achilles (VISA-A) questionnaire score, pain status, alternative treatments received and ultrasonographic neovascularisation score were recorded.

RESULTS:

In 46 patients (58 tendons), the VISA-A score significantly increased from 49.2 at baseline to 83.6 after 5 years ($p<0.001$) and from the 1-year to 5-year follow-up from 75.0 to 83.4 ($p<0.01$). 39.7% of the patients were completely pain-free at follow-up and 48.3% had received one or more alternative treatments. The sagittal tendon thickness decreased from 8.05 mm (SD 2.1) at baseline to 7.50 mm (SD 1.6) at the 5-year follow-up ($p=0.051$).

CONCLUSION:

At 5-year follow-up, a significant increase of VISA-A score can be expected. After the 3-month Alfredson's heel-drop exercise programme, almost half of the patients had received other therapies. Although improvement of symptoms can be expected at long term, mild pain may remain.

PMID: 22075719 [PubMed - indexed for MEDLINE]

Concussion

Arch Phys Med Rehabil. 2012 Apr 10. [Epub ahead of print]

Depression Following Concussion among Male and Female High School and Collegiate Athletes.

Kontos AP, Covassin T, Elbin RJ, Parker T.

Source

UPMC Sports Medicine Concussion Program, Department of Orthopaedic Surgery- University of Pittsburgh School of Medicine, Pittsburgh, PA, USA.

Abstract

OBJECTIVE:

To prospectively examine the relationship of sport-related concussion to depression and neurocognitive performance and symptoms among male and female high school and college athletes. A secondary objective was to explore age and sex differences.

DESIGN:

Pre-test, multiple post-test, repeated measures design

SETTING:

Laboratory

PARTICIPANTS:

Seventy-five high school and collegiate athletes with a diagnosed concussion

MAIN OUTCOME MEASURE(S):

Beck Depression Inventory-II (BDI-II), computerized neurocognitive test battery (Immediate Post Assessment and Cognitive Test [ImPACT]), which includes concussion symptoms (Post-Concussion Symptom Scale [PCSS]) at baseline; and at 2, 7, and 14 days post-injury.

RESULTS:

Concussed athletes exhibited significantly higher levels of depression from baseline at 2 days ($p \leq .001$), 7 days ($p = .006$), and 14 days post-concussion ($p = .04$). Collegiate athletes demonstrated a significant increase in depression at 14 days post-concussion compared to high school athletes ($p = .03$). There were no sex differences in depression levels. Neurocognitive decrements at 14 days were supported for reaction time ($p = .001$) and visual memory ($p = .001$). Somatic depression at 7 days post-concussion was related to slower reaction time at 7 days post-concussion. Somatic depression at 14 days post injury was related to lower visual memory scores at 14 days post injury.

CONCLUSIONS:

Although not clinically significant, athletes experienced increased depression scores up to 14 days following concussion that coincided with neurocognitive decrements in reaction time and visual memory. Somatic depression appears to be most salient with regard to lower neurocognitive performance. Mood assessments following concussion are warranted to help monitor and enhance recovery.

Copyright © 2012 the American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

PMID: 22503738 [PubMed - as supplied by publisher]

Shoulder/hyleronic

Arch Phys Med Rehabil. 2012 Apr 12. [Epub ahead of print]

Addition of Intra-articular Hyaluronate Injection to Physical Therapy Program Produces No Extra Benefits in Patients With Adhesive Capsulitis of the Shoulder: A Randomized Controlled Trial.

Hsieh LF, Hsu WC, Lin YJ, Chang HL, Chen CC, Huang V.

Source

Department of Physical Medicine, Shin Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan, R.O.C.; School of Medicine, Fu Jen Catholic University, New Taipei City, Taipei, Taiwan, R.O.C.

Abstract

Hsieh L-F, Hsu W-C, Lin Y-J, Chang H-L, Chen C-C, Huang V. Addition of intra-articular hyaluronate injection to physical therapy program produces no extra benefits in patients with adhesive capsulitis of the shoulder: a randomized controlled trial.

OBJECTIVE:

To compare the efficacy of intra-articular hyaluronic acid (HA) injections plus physical therapy (PT) with that of PT alone for the treatment of adhesive capsulitis (AC) of the shoulder.

DESIGN:

Prospective, randomized controlled trial.

SETTING:

Rehabilitation and orthopedics department of a private teaching hospital.

PARTICIPANTS:

Patients (N=70) with AC of the shoulder were randomly placed into either of the following treatment groups: group 1, HA injections with PT (HAPT group); or group 2, PT alone (PT group).

INTERVENTIONS:

The patients in group 1 received intra-articular glenohumeral joint injections of HA, 20mg, once per week for 3 consecutive weeks and also participated in a PT program for 3 months. The patients in group 2 received PT alone.

MAIN OUTCOME MEASURES:

Active and passive range of motion (ROM) of the affected shoulder, pain, disability, and quality of life.

RESULTS:

Both groups experienced improvements in terms of pain, disability, and quality of life after the treatments; furthermore, the active and passive ROM improved linearly with increasing treatment duration. When the groups were compared, no significant group effect was found for any of the outcome measurements.

CONCLUSIONS:

Intra-articular HA injections did not produce added benefits for patients with AC of the shoulder who were already receiving PT. Thus, the use of intra-articular HA injections for patients with AC of the shoulder should be carefully assessed to reduce unnecessary medical expenditures.

Copyright © 2012 the American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

PMID: 22502793 [PubMed - as supplied by publisher]

Knee/quads

Knee. 2012 Apr 13. [Epub ahead of print]

Changes in voluntary quadriceps activation predict changes in quadriceps strength after therapeutic exercise in patients with knee osteoarthritis.

Pietrosimone BG, Saliba SA.

Source

Department of Kinesiology, University of Toledo, Toledo, OH, United States.

Abstract

INTRODUCTION:

Recent rehabilitation paradigms have suggested that improving voluntary muscle activation may optimize strength outcomes related to resistance training. The aim of this study was to determine if changes in voluntary quadriceps activation could predict changes in quadriceps strength following a 4 week therapeutic exercise regimen.

METHOD:

Thirty-six participants with tibiofemoral osteoarthritis volunteered for this study, while 30 participants (14 males, 16 females, 58 ± 11.8 years, 172.2 ± 9.2 cm, 87.1 ± 18.5 kg) finished the 4 week supervised therapeutic exercise protocol and were used in the final analysis. Demographics, quadriceps strength and voluntary quadriceps activation using the burst superimposition technique were evaluated prior to the intervention. Following the therapeutic exercise program, quadriceps strength and voluntary activation were assessed. Simple correlations were performed to determine covariates in a multiple regression equation to evaluate if changes in voluntary quadriceps activation could predict changes in quadriceps strength.

RESULTS:

There was a significant moderate simple correlation between participant height and change in MVIC ($r = -0.44$, $P = 0.01$). Both height and changes in voluntary quadriceps activation significantly predicted changes in MVIC ($R(2) = 0.66$, $P < 0.001$). After controlling for patient height, a change in voluntary quadriceps activation produced a significant improvement in the prediction of a change in MVIC ($\Delta R(2) = 0.47$, $P < 0.001$).

DISCUSSION:

Changes in voluntary quadriceps activation predicted 47% of variance in the change in quadriceps strength. These results suggest that interventions aimed at manipulating quadriceps activation may be helpful for improving quadriceps strength in patients with tibiofemoral osteoarthritis.

LEVEL OF EVIDENCE:

2b.

Copyright © 2012. Published by Elsevier B.V.

PMID: 22503429 [PubMed - as supplied by publisher]

Stretching/leg cramps

J Physiother. 2012;58(1):17-22.

Stretching before sleep reduces the frequency and severity of nocturnal leg cramps in older adults: a randomised trial.

Hallegraeff JM, van der Schans CP, de Ruiter R, de Greef MH.

Source

Hanze University of Applied Sciences, Groningen. jmhallegraeff@online.nl

Abstract

QUESTION:

In adults who experience nocturnal leg cramps, does stretching of the calf and hamstring muscles each day just before sleep reduce the frequency and severity of the cramps?

DESIGN:

A randomised trial with concealed allocation and intention-to-treat analysis.

PARTICIPANTS:

Eighty adults aged over 55 years with nocturnal leg cramps who were not being treated with quinine.

INTERVENTION:

The experimental group performed stretches of the calf and hamstring muscles nightly, immediately before going to sleep, for six weeks. The control group performed no specific stretching exercises. Both groups continued other usual activities.

OUTCOME MEASURES:

Participants recorded the frequency of nocturnal leg cramps in a daily diary. Participants also recorded the severity of the pain associated with nocturnal leg cramps on a 10-cm visual analogue scale. Adverse events were also recorded.

RESULTS:

All participants completed the study. At six weeks, the frequency of nocturnal leg cramps decreased significantly more in the experimental group, mean difference 1.2 cramps per night (95% CI 0.6 to 1.8). The severity of the nocturnal leg cramps had also decreased significantly more in the experimental group than in the control group, mean difference 1.3 cm (95% CI 0.9 to 1.7) on the 10-cm visual analogue scale.

CONCLUSION:

Nightly stretching before going to sleep reduces the frequency and severity of nocturnal leg cramps in older adults.

TRIAL REGISTRATION:

NCT01421628.

Copyright © 2012 Australian Physiotherapy Association. Published by .. All rights reserved.

PMID: 22341378 [PubMed - indexed for MEDLINE]

Exercise/sleep

Sleep. 2011 Dec 1;34(12):1631-40.

The effect of exercise training on obstructive sleep apnea and sleep quality: a randomized controlled trial.

Kline CE, Crowley EP, Ewing GB, Burch JB, Blair SN, Durstine JL, Davis JM, Youngstedt SD.
Source

Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA 15213, USA. klinec@upmc.edu

Abstract

STUDY OBJECTIVES:

To evaluate the efficacy of a 12-week exercise training program for reducing obstructive sleep apnea (OSA) severity and improving sleep quality, and to explore possible mechanisms by which exercise may reduce OSA severity.

DESIGN:

Randomized controlled trial.

SETTING:

Clinical exercise physiology center, sleep laboratory.

PARTICIPANTS:

Forty-three sedentary and overweight/obese adults aged 18-55 years with at least moderate-severity untreated OSA (screening apnea-hypopnea index [AHI] ≥ 15).

INTERVENTIONS:

Participants randomized to exercise training (n = 27) met 4 times/week for 12 weeks and performed 150 min/week of moderate-intensity aerobic activity, followed by resistance training twice/week. Participants randomized to a stretching control (n = 16) met twice weekly for 12 weeks to perform low-intensity exercises designed to increase whole-body flexibility.

MEASUREMENTS AND RESULTS:

OSA severity was assessed with one night of laboratory polysomnography (PSG) before and following the 12-week intervention. Measures of sleep quality included PSG, actigraphy (7-10 days), and the Pittsburgh Sleep Quality Index. Compared with stretching, exercise resulted in a significant AHI reduction (exercise: 32.2 ± 5.6 to 24.6 ± 4.4 , stretching: 24.4 ± 5.6 to 28.9 ± 6.4 ; $P < 0.01$) as well as significant changes in oxygen desaturation index (ODI; $P = 0.03$) and stage N3 sleep ($P = 0.03$). Reductions in AHI and ODI were achieved without a significant decrease in body weight. Improvements in actigraphic sleep and subjective sleep quality were also noted following exercise compared with stretching.

CONCLUSIONS:

Exercise training had moderate treatment efficacy for the reduction of AHI in sedentary overweight/obese adults, which suggests that exercise may be beneficial for the management of OSA beyond simply facilitating weight loss.

TRIAL REGISTRATION:

Clinicaltrials.gov identification number NCT00956423.

Comment in

- [Sleep](#). 2011;34(12):1621-2.

PMID: 22131599 [PubMed - indexed for MEDLINE] PMCID: PMC3208839 [Available on 2012/6/1]

Vitamin D

Spine J. 2012 Apr 10. [Epub ahead of print]

Hypovitaminosis D as a risk factor of subsequent vertebral fractures after kyphoplasty.

Zafeiris CP, Lyriris GP, Papaioannou NA, Gratsias PE, Galanos A, Chatziioannou SN, Pneumaticos SG.

Source

Abstract

BACKGROUND CONTEXT:

Over the past 20 years, methods of minimally invasive surgery have been developed for the treatment of vertebral compression fractures. Balloon kyphoplasty and vertebroplasty are associated with a recurrent fracture risk in the adjacent levels after the surgical procedure. In certain patient categories with impaired bone metabolism, the risk of subsequent fractures after kyphoplasty is increased.

PURPOSE:

To determine the incidence of recurrent fractures after kyphoplasty and explore whether the status of bone metabolism and 25-hydroxyvitamin D (25(OH)D) levels affect the occurrence of these fractures.

STUDY DESIGN:

Prospective longitudinal clinical study.

PATIENT SAMPLE:

Forty female postmenopausal women with primary osteoporosis and acute symptomatic vertebral compression fractures.

OUTCOME MEASURES:

Identification of new vertebral fractures and documentation of indicators of bone metabolism.

METHODS:

A total of ninety-eight kyphoplasties were performed in 40 female patients. Balloon kyphoplasty was performed on all symptomatic acute vertebral compression fractures. Age, body mass index, history of tobacco use, number of initial vertebral fractures, intradiscal cement leakage, history of nonspinal fractures, use of antiosteoporotic medications, bone mineral density, bone turnover markers, and 25(OH)D levels were assessed. All participants were evaluated clinically and/or radiographically. Follow-up period was 18 months.

RESULTS:

The mean population age was 70.6 years (range, 40-83 years). After initial kyphoplasty procedure, nine patients (11 levels) (22.5% of patients; 11.2% of levels) developed a postkyphoplasty vertebral compression fracture. Cement leakage was identified in seven patients (17.5%). The patients without recurrent fractures after kyphoplasty demonstrated higher levels of 25(OH)D (22.6 ± 5.51 vs. 14.39 ± 7.47 ; $p=.001$) and lower N-terminal cross-linked telopeptide values (17.11 ± 10.20 vs. 12.90 ± 4.05 ; $p=.067$) compared with the patients with recurrent fractures.

CONCLUSIONS:

Bone metabolism and 25(OH)D levels seem to play a role in the occurrence of postkyphoplasty recurrent vertebral compression fractures.

Copyright © 2012 Elsevier Inc. All rights reserved

HA/Migraine

Lavender Essential Oil in the Treatment of Migraine Headache: A Placebo-Controlled Clinical Trial □ *European Neurology*, 04/23/2012 **Clinical Article**

Sasannejad P et al. – The present study suggests that inhalation of lavender essential oil may be an effective and safe treatment modality in acute management of migraine headaches.

Methods

- Forty-seven patients with definite diagnosis of migraine headache were divided into cases and controls.
- Cases inhaled lavender essential oil for 15 min, whereas the control group used liquid paraffin for the same time period.
- Patients were asked to record their headache severity and associated symptoms in 30-min intervals for a total of 2 h.
- The authors matched the two groups for key confounding factors.

Results

- The mean reduction of headache severity in cases was 3.6 ± 2.8 based on Visual Analogue Scale score.
- The reduction was 1.6 ± 1.6 in controls.
- This difference between the controls and cases was statistically significant with $p < 0.0001$.
- From 129 headache attacks in cases, 92 responded entirely or partially to lavender.
- In the control group, 32 out of 68 recorded headache attacks responded to placebo.
- The percentage of responders was significantly higher in the lavender group than the placebo group ($p = 0.001$).

LBP/PT

Management Patterns in Acute Low Back Pain: The Role of Physical Therapy □ **Spine, 04/23/2012 Clinical Article**

Gellhorn AC et al. – There was a lower risk of subsequent medical service usage among patients who received PT early after an episode of acute low back pain relative to those who received physical therapy (PT) at later times. Medical specialty variations exist regarding early use of PT, with potential underutilization among generalist specialties.

Methods

- A national 20% sample of the Centers for Medicare and Medicaid Services physician outpatient billing claims was analyzed.
- Patients were selected who received treatment for low back pain between 2003 and 2004 (n = 439,195).
- To exclude chronic low back conditions, patients were excluded if they had a prior visit for back pain, lumbosacral injection, or lumbar surgery within the previous year.
- Main outcome measures were rates of lumbar surgery, lumbosacral injections, and frequent physician office visits for low back pain during the following year.

Results

- Based on logistic regression analysis, the adjusted odds ratio for undergoing surgery in the group of enrollees that received PT in the acute phase (<4 weeks) compared to those receiving PT in the chronic phase (>3 months) was 0.38 (95% confidence interval [CI], 0.36–0.41), adjusting for age, sex, diagnosis, treating physician specialty, and comorbidity.
- The adjusted odds ratio for receiving a lumbosacral injection in the group receiving PT in the acute phase was 0.46 (95% CI, 0.44–0.49), and the adjusted odds ratio for frequent physician office usage in the group receiving PT in the acute phase was 0.47 (95% CI, 0.44–0.50).

Longitudinal Associations Between Physical Load and Chronic Low Back Pain in the General Population: The Doetinchem Cohort Study □ *Spine*, 04/23/2012

Van Oostrom SH et al. – Awkward postures were associated with chronic LBP in the general population. Exposure to awkward postures at 2 measurements with 5 years in between did increase the risk for incident chronic low back pain (LBP), but not for persistence of chronic LBP.

Study Design. Prospective cohort study.

Objective. We explored long-term associations between physical load exposure and chronic low back pain (LBP) using data from an ongoing population-based cohort study.

Summary of Background Data. Physical load in work or daily life is often studied in relation to LBP. Most studies are cross-sectional or have a limited follow-up.

Methods. Between 1993 and 2007, 4738 men and women aged 25 to 64 years were measured maximal 3 times with 5-year intervals. Physical load in daily activities (9 items, *e.g.*, awkward postures, mechanical vibration) was assessed by questionnaire at 2 measurements and chronic LBP 3 times. Physical load exposure at both measurements was described. Multivariable logistic regression analyses were adjusted for sex, age, education, work status, body mass index, physical activity, and smoking.

Results. Despite stable prevalence rates of physical load exposure, about 50% of the participants exposed changed their exposure during a 5-year period. 7.2% of the participants reported awkward postures at 2 measurements, 8.4% at the first measurement only, and 6.8% at the second measurement only. Among all physical load variables, associations with chronic LBP were found only for awkward postures. An increased risk for incident chronic LBP was found in participants exposed twice to awkward postures. In contrast, only single exposure to awkward postures was associated with persistence of chronic LBP.

Conclusion. Awkward postures were associated with chronic LBP in the general population. Exposure to awkward postures at 2 measurements with 5 years in between did increase the risk for incident chronic LBP, but not for persistence of chronic LBP.

Neuroplasticity

Neural mechanisms underlying deafferentation pain: a hypothesis from a neuroimaging perspective □ *Journal of Orthopaedic Science*, 04/23/2012

Hanakawa T – This finding indicates that motor, somatosensory, and pain systems communicate among each other via the neural network. A better understanding of the plastic mechanisms influencing such cross-talk among these systems will help develop therapeutic interventions using brain stimulation and neurofeedback.

deafferentation pain following nerve injury annoys patients, and its management is a challenge in clinical practice. Although the mechanisms underlying deafferentation pain remain poorly understood, progress in the development of multidimensional neuroimaging techniques is casting some light on these issues. Deafferentation pain likely results from reorganization of the nervous system after nerve injury via processes that interact with the substrates for pain perception (the pain matrix). Therapeutic effects of motor cortex stimulation on deafferentation pain suggest that the core mechanisms underlying deafferentation pain also interact with the motor system. Therefore, simultaneous neuroimaging and brain stimulation, an emerging neuroimaging technique, was developed to investigate complicated interactions among motor, somatosensory, and pain systems. In healthy participants, parts of the pain matrix (the anterior cingulate cortex, parietal operculum, and thalamus) show activity during both somatosensory stimulation and brain stimulation to the motor cortex. This finding indicates that motor, somatosensory, and pain systems communicate among each other via the neural network. A better understanding of the plastic mechanisms influencing such cross-talk among these systems will help develop therapeutic interventions using brain stimulation and neurofeedback.

Lumbar Computerized Adaptive Test and Modified Oswestry Low Back Pain Disability Questionnaire: Relative Validity and Important Change

Dennis L. Hart, Paul W. Stratford, Mark W. Werneke, Daniel Deutscher, Ying-Chih Wang

DOI: 10.2519/jospt.2012.3942

STUDY DESIGN: Retrospective analyses of longitudinal, observational cohort data.

OBJECTIVES: To compare discriminating ability and minimal clinically important improvement (MCII) calculated using functional status (FS) measures estimated from the Lumbar Computerized Adaptive Test (LCAT) and Modified Oswestry Low Back Pain Disability Questionnaire (ODI). **BACKGROUND:** LCAT and ODI are commonly used to estimate FS in patients seeking outpatient therapy but have not been compared directly. **METHODS:** Data from 8,198 adults were analyzed from patients who completed LCAT and ODI at intake; 3,379 (41%) completed both surveys at discharge. Global ratings of change data were available from 980 patients. Discriminating ability of FS estimates from LCAT and ODI was estimated using Relative Validity (RV) calculated by dividing F values from LCAT and ODI ANCOVAs for important risk-adjustment variables. MCII was estimated using receiver operating characteristic (ROC) analyses by quartiles of intake FS values, and areas under the curves (AUC) were compared. **RESULTS:** RV ratios favored LCAT for age (3.7, 95% CI 2.0-8.9), acuity (1.3, 95% CI 1.1-1.6), comorbidities (1.8, 95% CI 1.3-2.6), and surgical history (1.8, 95% CI 1.2-2.9). MCII cut-scores per quartile favored LCAT. ROC AUCs were not different. **CONCLUSIONS:** FS measures estimated by both questionnaires had similar psychometric characteristics. The LCAT FS estimates tended to be more discriminating than ODI FS estimates. MCII cut-scores by quartile of intake FS favored the LCAT. Given the need to be efficient and precise estimating measures of FS, particularly for older patients, results favor the LCAT in busy, automated outpatient therapy clinics increasingly serving an aging population.

J Orthop Sports Phys Ther, Epub 19 April 2012. doi:10.2519/jospt.2012.3942

Massage

Eur J Cancer Care (Engl). 2012 Mar;21(2):233-41. doi: 10.1111/j.1365-2354.2011.01306.x. Epub 2011 Nov 8.

Attitudes towards massage modify effects of manual therapy in breast cancer survivors: a randomised clinical trial with crossover design.

Fernández-Lao C, Cantarero-Villanueva I, Díaz-Rodríguez L, Cuesta-Vargas AI, Fernández-Delas-Peñas C, Arroyo-Morales M.

Source

Physical Therapy Department, Faculty of Health Sciences, Universidad de Granada, Avda. Madrid s/n, Granada, Spain.

Abstract

Our aims were to investigate the immediate effect of myofascial release on heart rate variability and mood state, and the influence of attitude towards massage in breast cancer survivors with cancer-related fatigue. Twenty breast cancer survivors reporting moderate to high cancer-related fatigue participated in this crossover study. All patients presented to the laboratory at the same time of the day on two occasions separated by a 2-week interval. At each session, they received either a massage intervention or control intervention. Holter electrocardiogram recordings and Profile of Mood States questionnaire (six domains: tension-anxiety, depression-dejection, anger-hostility, vigour, fatigue, confusion) were obtained before and immediately after each intervention. The attitude towards massage scale was collected before the first session in all breast cancer survivors. The results showed a significant session \times time interaction for standard deviation of the normal-to-normal interval (SDNN) ($F= 5.063$, $P= 0.039$), square root of mean squared differences of successive normal-to-normal intervals (RMSSD) ($F= 8.273$, $P= 0.010$), high-frequency component (HF) ($F= 7.571$, $P= 0.013$), but not for index heart rate variability ($F= 3.451$, $P= 0.080$), low-frequency component (LF) ($F= 0.014$, $P= 0.997$) and ratio LF/HF ($F= 3.680$, $P= 0.072$): significant increases in SDNN, RMSSD and HF domain ($P < 0.05$) were observed after the manual therapy intervention, with no changes after placebo ($P > 0.6$). No influence of the attitude scale on heart rate variability results was found. A significant session \times time interaction was also found for fatigue ($F= 5.101$, $P= 0.036$) and disturbance of mood ($F= 6.690$, $P= 0.018$) scales of the Profile of Mood States: patients showed a significant decrease in fatigue and disturbance of mood ($P < 0.001$) after manual therapy, with no changes after placebo ($P > 0.50$). A significant influence of the attitude scale was observed in tension-anxiety, depression-dejection and anger-hostility scales. This controlled trial suggests that massage leads to an immediate increase of heart rate variability and an improvement in mood in breast cancer survivors with cancer-related fatigue. Further, the positive impact of massage on cancer-related fatigue is modulated by the attitude of the patient towards massage.

© 2011 Blackwell Publishing Ltd.

PMID: 22060159 [PubMed - indexed for MEDLINE]

Epidurals

A double-blind, randomized, prospective study of epidural steroid injection vs. the mild procedure in patients with symptomatic lumbar spinal stenosis □Pain Practice, 04/20/2012
Brown LL – This study demonstrated that in LSS patients suffering with neurogenic claudication, mild provides statistically significantly better pain reduction and improved functional mobility vs. treatment with epidural steroid injections (ESIs).

Methods

- This was a double-blind, randomized, prospective study of ESI vs. the mild procedure in patients with symptomatic LSS, conducted at a single pain management center.
- Patient reported outcome measures included Visual Analog Scale, Oswestry Disability Index, and Zurich Claudication Questionnaire (ZCQ) patient satisfaction.

Results

- 38 patients were randomized into 2 treatment groups, 21 in mild and 17 in ESI.
- At 6- and 12-week follow-up, patients treated with mild reported significantly greater pain decrease over time ($P < 0.0001$), and significantly greater functional mobility improvement over time ($P < 0.0018$) than ESI patients.
- At week 6, mild ZCQ patient satisfaction score of 2.2 indicated a higher level of satisfaction than for ESI with a score of 2.8.
- In addition, 12-week ZCQ satisfaction score was 1.8, demonstrating sustained near-term satisfaction in the mild group.

No major mild or ESI device or procedure-related complications were reported.

LBP

Recurrence of Radicular Pain or Back Pain After Nonsurgical Treatment of Symptomatic Lumbar Disk Herniation □ Archives of Physical Medicine and Rehabilitation, 04/20/2012

Suri P et al. – Recurrence of radicular pain is relatively common after nonsurgical treatment of lumbar disk herniation (LDH) and is predicted by longer time to initial resolution of pain.

Objectives

To determine recurrence rates of lower-extremity radicular pain after nonsurgical treatment of acute symptomatic lumbar disk herniation (LDH), and to identify predictors of recurrence.

Design

Prospective inception cohort.

Setting

Outpatient spine clinic.

Participants

Patients (N=79) reporting resolution of radicular pain after magnetic resonance imaging confirmation of LDH.

Interventions

Individualized nonsurgical treatment tailored to the patient. All patients received education, but other treatments varied depending on the individual.

Main Outcome Measures

Resolution of radicular pain was defined as a pain-free period of ≥ 1 month. Patients who reported resolution of radicular pain within 1 year after seeking care for acute LDH were asked whether pain had recurred at 1 year after seeking care and were also reassessed 1 year after the time of resolution of radicular pain and 2 years after seeking care. Patients reported on recurrence and the date of recurrence, if any. We evaluated the 1-year incidence of recurrence, using Kaplan-Meier survival plots. We examined predictors of recurrence using bivariate and multivariate Cox proportional hazards models. We examined the secondary outcome of back pain recurrence using identical methods.

Results

Twenty-five percent (95% confidence interval [CI], 15–35) of individuals with resolution of radicular pain for at least 1 month reported subsequent recurrence of pain within 1 year after resolution. The only factor independently associated with radicular pain recurrence was the number of months prior to resolution of pain (hazard ratio per month=1.24; 95% CI, 1.13–1.37; $P<.001$). The 1-year incidence of back pain recurrence was 43% (95% CI, 30–56), and older age decreased the hazard of recurrence.

Conclusions

Recurrence of radicular pain is relatively common after nonsurgical treatment of LDH and is predicted by longer time to initial resolution of pain.

Key Words: [Intervertebral disk displacement](#) , [Outcome assessment \(health care\)](#) , [Rehabilitation](#)

LBP

Diagnosis of the vertebral level from which low back or leg pain originates. a comparison of clinical evaluation, MRI and epiduroscopy □Pain Practice, 04/19/2012

Bosscher HA et al. – Results of this study indicate that epiduroscopy is more reliable than is either clinical evaluation or MRI for determining the vertebral level where clinically significant spinal pathology occurs in patients with LBP/RP.

Methods

- Observational cohort study of 143 patients 19 to 88 years of age undergoing spinal canal endoscopy (epiduroscopy) in a combined academic and private practice setting January 2008 to December 2008.
- Patients were asked whether pain generated by pressure upon epidural structures with the tip of an endoscope was similar in character and distribution (concordant) to the pain for which patients sought treatment.
- Notes from clinical evaluation and MRI reports were reviewed, and segmental level determined to be the locus of pathology was tabulated.

Results

- One hundred twenty-five (87%) patients reported maximal reproducible pain at a specific level during epiduroscopy.
- The most common level was at L4 to L5 (87 patients).
- The least common level was L5 to S1 (2 patients).
- In only 40 patients did the level determined by clinical evaluation correlate with the level at which pain could be reproduced during epiduroscopy.
- MRI indicated a specific vertebral level that corresponded to the level at which pain could be reproduced during epiduroscopy in 28 of 143 (20%) patients.

The results of the 3 diagnostic methods were significantly different ($P < 0.01$).

Fibromyalgia

Decreased intrinsic brain connectivity is associated with reduced clinical pain in fibromyalgia □ **Arthritis & Rheumatism, 04/19/2012**

Napadow V et al. – The findings suggest that intrinsic brain connectivity can be used as a candidate objective marker that tracks intra–subject with changes in spontaneous chronic pain in fibromyalgia (FM). The authors propose that intrinsic connectivity measures could potentially be used either in research or clinical settings as a complementary, more objective outcome.

Methods

- 17 FM patients underwent resting state fMRI at baseline and following 4 weeks of a non-pharmacological intervention to diminish pain.
- Intrinsic default mode network (DMN) connectivity was evaluated using probabilistic independent component analysis.
- A paired analysis evaluated longitudinal changes in intrinsic DMN connectivity and a multiple linear regression investigated correlations between longitudinal changes in clinical pain and changes in intrinsic DMN connectivity.
- Changes in clinical pain were assessed with the Short Form of the McGill Pain Questionnaire (SF-MPQ).

Results

- Clinical pain was reduced following therapy (SF-MPQ sensory scale: $p < 0.02$).

Intrinsic DMN connectivity to the insula was reduced, and this reduction was correlated with reductions in pain (corrected $p < 0.05$).

Knee/Tests

Physiotherapy. 2012 Jun;98(2):93-100. Epub 2011 Oct 7.

Best tests/clinical findings for screening and diagnosis of patellofemoral pain syndrome: a systematic review.

Cook C, Mabry L, Reiman MP, Hegedus EJ.

Source

Division of Physical Therapy, Walsh University, 2020 East Maple Street, North Canton, OH 44720, United States.

Abstract

BACKGROUND:

Diagnosis of patellofemoral pain syndrome (PFPS) is commonly performed using a myriad of clinical and imaging-based criteria.

OBJECTIVES:

The objective of this systematic literature review was to summarize the research on accuracy of individual clinical tests/findings for PFPS.

DATA SOURCES:

MEDLINE, ProQuest Nursing and Allied Health, Cochrane Trials, PEDro, and CINAHL.

STUDY SELECTION OR ELIGIBILITY CRITERIA: PRISMA guidelines were followed for this review. To be considered for review, the study required: (1) a description of a clinical test or tests used for diagnosing PFPS (including a test that was combined with another finding such as patient history), (2) a report of the diagnostic accuracy of the measures (e.g., sensitivity and specificity), and (3) an acceptable reference standard for comparison. **STUDY APPRAISAL OR SYNTHESIS METHODS:** Quality Assessment of Studies of Diagnostic Accuracy (QUADAS) scores were completed on each selected article. Sensitivity, specificity, and negative and positive likelihood ratios (LR-/LR+) were calculated for each diagnostic test described.

RESULTS:

The systematic search strategy and hand search revealed 704 potential articles, 9 of which met the criteria for this review; analysing a total of 22 PFPS clinical tests. After assessment using the QUADAS score, 1 of the 9 articles was of high quality. The tests with the highest reported diagnostic value were also associated with studies that had the lowest QUADAS values.

CONCLUSION:

A majority of the studies that have investigated diagnostic accuracy of clinical tests for PFPS demonstrate notable design or reporting biases, and at this stage, determining the best tests for diagnosis of PFPS is still difficult.

Copyright © 2011 Chartered Society of Physiotherapy. Published by Elsevier Ltd. All rights reserved

Insomnia/Exercise

Sleep Med. 2011 Dec;12(10):1018-27. Epub 2011 Oct 22.

Effects of moderate aerobic exercise training on chronic primary insomnia.

Passos GS, Poyares D, Santana MG, D'Aurea CV, Youngstedt SD, Tufik S, de Mello MT.

Source

Department of Psychobiology, Universidade Federal de São Paulo, São Paulo, SP, Brazil.
gisasoares@hotmail.com

Abstract

OBJECTIVE:

To evaluate the effect of long-term moderate aerobic exercise on sleep, quality of life, and mood of individuals with chronic primary insomnia, and to examine whether these effects differed between exercise in the morning and exercise in the late afternoon.

METHODS:

Nineteen sedentary individuals with chronic primary insomnia, mean age 45.0 (standard error [SE] 1.9) years, completed a 6-month exercise training protocol, randomized to morning and late-afternoon exercise groups.

RESULTS:

Combining polysomnographic data across both time points, this study found a significant decrease in sleep onset latency (from 17.1 [SE 2.6] min to 8.7 [SE 1.4] min; $P < 0.01$) and wake time after sleep onset (from 63.2 [SE 12.8] min to 40.1 [SE 6.0] min), and a significant increase in sleep efficiency (from 79.8 [SE 3.0]% to 87.2 [SE 1.6]%) following exercise. Data from sleep diaries revealed significant improvement in sleep onset latency (from 76.2 [SE 21.5] min to 80.3 [SE 7.4] min) sleep quality (from 41.5 [SE 5.2]% to 59.4 [SE 6.6]%) and feeling rested in the morning (from 50.8 [SE 5.3] to 65.1 [SE 5.0]). There were generally no significant differences in response between morning and late-afternoon exercise. Following exercise, some quality-of-life measures improved significantly, and a significant decrease was seen in the following Profile of Mood State measures: tension-anxiety (from 7.2 [SE 1.0] to 3.5 [SE 1.0]), depression (from 5.9 [SE 1.2] to 3.3 [SE 1.1]) and total mood disturbance (from 9.2 [SE 4.8] to -1.7 [SE 4.8]). These effects did not vary between morning and late-afternoon exercise.

CONCLUSION:

Long-term moderate aerobic exercise elicited significant improvements in sleep, quality of life and mood in individuals with chronic primary insomnia.

Copyright © 2011 Elsevier B.V. All rights reserved.

PMID: 22019457 [PubMed - indexed for MEDLINE]

Rolfing

J Altern Complement Med. 2011 Oct;17(10):891-9. Epub 2011 Oct 12.

Structural integration, an alternative method of manual therapy and sensorimotor education.

Jacobson E.

Source

Department of Global Health and Social Medicine, Harvard Medical School, Boston, MA, USA.
eric_jacobson@hms.harvard.edu

Abstract

OBJECTIVES:

The objectives of this report are to review the clinical practice of Structural Integration (SI), an alternative method of soft-tissue manipulation and sensorimotor education, and to summarize the evidence to date for mechanism and clinical efficacy.

METHODS:

The author's personal knowledge of SI literature, theory, and practice was supplemented by a database search, consultation with other senior SI practitioners, and examination of published bibliographies and websites that archive SI literature.

RESULTS:

SI purports to improve biomechanical functioning as a whole by progressively approximating specific ideals of posture and movement, rather than to treat particular symptoms. Hypothesized mechanisms at the level of local tissue change include increases in soft-tissue pliability, release of adhesions between adjacent soft-tissue structures, and increased interstitial fluid flow with consequently improved clearance of nociceptive potentiators. Hypothesized mechanisms for more global changes include improved biomechanical organization leading to reductions in mechanical stress and nociceptive irritation, a perception of improved biomechanical efficiency and coordination that generalizes to the self, and improvements in sensory processing and vagal tone. Emotional catharsis is also thought to contribute to psychologic changes. Limited preliminary evidence exists for improvements in neuromotor coordination, sensory processing, self-concept and vagal tone, and for reductions in state anxiety. Preliminary, small sample clinical studies with cerebral palsy, chronic musculoskeletal pain, impaired balance, and chronic fatigue syndrome have reported improvements in gait, pain and range-of-motion, impaired balance, functional status, and well-being. Adverse events are thought to be mild and transient, although survey data are not available. Contraindications are thought to be the same as for massage.

CONCLUSIONS:

Evidence for clinical effectiveness and hypothesized mechanisms is severely limited by small sample sizes and absence of control arms. In view of the rapidly increasing availability of SI and its use for treatment of musculoskeletal pain and dysfunction, more adequate research is warranted.

PMID: 21992437 [PubMed - indexed for MEDLINE] PMCID: PMC3198617 [Available on 2012/10/1]

LBP/Manipulation

J Electromyogr Kinesiol. 2012 Apr 17. [Epub ahead of print]

Association between history and physical examination factors and change in lumbar multifidus muscle thickness after spinal manipulation in patients with low back pain.

Koppenhaver SL, Fritz JM, Hebert JJ, Kawchuk GN, Parent EC, Gill NW, Childs JD, Teyhen DS.

Source

U.S. Army-Baylor University, Doctoral Program in Physical Therapy, San Antonio, TX, USA; Faculty, School of Chiropractic and Sports Science, Murdoch University, Perth, Australia.

Abstract

Understanding the clinical characteristics of patients with low back pain (LBP) who display improved lumbar multifidus (LM) muscle function after spinal manipulative therapy (SMT) may provide insight into a potentially synergistic interaction between SMT and exercise. Therefore, the purpose of this study was to identify the baseline historical and physical examination factors associated with increased contracted LM muscle thickness one week after SMT. Eighty-one participants with LBP underwent a baseline physical examination and ultrasound imaging assessment of the LM muscle during submaximal contraction before and one week after SMT. The relationship between baseline examination variables and 1-week change in contracted LM thickness was assessed using correlation analysis and hierarchical multiple linear regression. Four variables best predicted the magnitude of increases in contracted LM muscle thickness after SMT. When combined, these variables suggest that patients with LBP, (1) that are fairly acute, (2) have at least a moderately good prognosis without focal and irritable symptoms, and (3) exhibit signs of spinal instability, may be the best candidates for a combined SMT and lumbar stabilization exercise (LSE) treatment approach.

Published by Elsevier Ltd.

PMID: 22516351 [PubMed - as supplied by publishe

Multiple Sclerosis

Phys Ther. 2012 Apr 19. [Epub ahead of print]

Cervical Disk Pathology in Patients With Multiple Sclerosis: Two Case Reports.

Mullen AE, Wilmarth MA, Lowe S.

Source

A.E. Mullen, PT, DPT, College of Professional Studies, Northeastern University, Boston, Massachusetts. Mailing address: 845 Karen St, Palm Harbor, FL 34684 (USA).

Abstract

BACKGROUND AND PURPOSE:

A patient with multiple sclerosis (MS) may be seen by a physical therapist for evaluation before the MS diagnosis is definitively made, after a relapse, or during a progression. The diagnosis of MS should be part of the differential diagnosis if a patient with neurological issues fits the pattern of a progressive disease. MS can affect any part of the central nervous system. Cervical pathology can be confused with relapsing symptoms of MS. The purpose of this report is to demonstrate how easily cervical pathology can be overlooked in a patient with MS.

CASE DESCRIPTION:

Two case reports of patients with relapsing MS are presented in this paper. Both cases were referred to physical therapy after failing to respond to the standard methylprednisolone intravenous (IV) therapy treatment. One patient reported multiple falls and complained of increasing cervical pain and spasm, fatigue, bouts of diplopia, and difficulty ambulating. The other complained of headaches, visual disturbances, and cervical pain with radicular symptoms. Contrast magnetic resonance imaging (MRIs) did not reveal new MS lesions, or the extension of old ones. The cervical herniations in the first case, not previously documented, were old. The bulging discs in the second case, seen on a previous study were unchanged. The MRI findings did not support the diagnosis of acute inflammatory MS or acute cervical pathology.

OUTCOMES:

Both patients responded to physical therapy intervention once the cervical symptoms were directly addressed. As the cervical pain and spasm decreased, the relapsing MS symptoms of dysmetria, balance disturbance, and ataxic gait began to improve. In both cases eye function was slow to recover with persistent impairment. Both patients returned to their pre-morbid activity and socialization level.

PMID: 22517783 [PubMed - as supplied by publisher]

Shoulder/rotator cuff

J Bone Joint Surg Am. 2012 May 2;94(9):801-8.

Evolution of nonoperatively treated symptomatic isolated full-thickness supraspinatus tears.

Fucentese SF, von Roll AL, Pfirrmann CW, Gerber C, Jost B.

Abstract

BACKGROUND:

The natural history of small, symptomatic rotator cuff tears is currently unclear. The purpose of the present study was to assess the clinical and structural outcomes for a consecutive series of patients with symptomatic, isolated full-thickness supraspinatus tears who had been offered rotator cuff repair but declined operative treatment.

METHODS:

In the study period, twenty-four patients with isolated full-thickness supraspinatus tears that had been diagnosed by means of magnetic resonance arthrography were offered rotator cuff repair and elected nonoperative treatment. The twenty men and four women had an average age of fifty-two years at the time of diagnosis. At a median of forty-two months after the diagnosis, all patients were reexamined clinically according to the Constant and Murley scoring system and all shoulders underwent standard magnetic resonance imaging.

RESULTS:

At the time of follow-up, the mean subjective shoulder score was 74% of that for a normal shoulder and the mean Constant score was 75 points (relative Constant score, 86%). The mean rotator cuff tear size did not change significantly over time (95% confidence interval, 0.51 to 1.12). In two shoulders, the tear was no longer detectable on magnetic resonance imaging, in nine shoulders the tear was smaller than it had been at the time of the initial diagnosis, in nine patients the tear had not changed, and in six patients the tear had increased in size. There was a slight but significant progression of fatty muscle infiltration of the supraspinatus, but no patient had fatty infiltration beyond stage 2 at the time of the latest follow-up (95% confidence interval, 0% to 14%).

CONCLUSIONS:

In a consecutive series of patients who had been offered repair of an isolated, symptomatic supraspinatus tear, the refusal of operative treatment resulted in surprisingly high clinical patient satisfaction and no increase of the average size of the rotator cuff tear 3.5 years after the recommendation of operative repair. This study confirms that the size of small rotator cuff tears does not invariably increase over a limited period of time. Distinguishing tears that will increase in size from those that will not needs further study.

LEVEL OF EVIDENCE:

Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence

Manipulation

Placebo manipulations reduce hyperalgesia in neuropathic pain □Pain, 04/25/2012 **Clinical Article**

Petersen GL et al. – The possible mechanisms underlying the placebo effects in hyperalgesia are discussed, and implications for treatment are outlined.

- Several studies have shown that placebo analgesia effects can be obtained in healthy volunteers, as well as patients suffering from acute postoperative pain and chronic pain conditions such as irritable bowel syndrome.
- However, it is unknown whether placebo analgesia effects can be elicited in chronic pain conditions with a known pathophysiology such as a nerve injury.
- Nineteen patients who had developed neuropathic pain after thoracotomy were exposed to a placebo manipulation in which they received either open or hidden administrations of lidocaine.
- Before the treatment, the patients rated their levels of spontaneous pain and expected pain and completed a questionnaire on their emotional feelings (Positive Affect Negative Affect Schedule) and went through quantitative sensory testing of evoked pain (brush and cold allodynia, heat pain tolerance, area of pinprick hyperalgesia, wind-up-like pain after pinprick stimulation).
- The placebo manipulation significantly reduced the area of pinprick hyperalgesia ($P=.027$), and this placebo effect was significantly related to low levels of negative affect ($P=.008$; $R^2=0.362$) but not to positive affect or expected pain levels.
- No placebo effect was observed in relation to spontaneous pain or evoked pain, which is most likely due to low pain levels resulting in floor effects.

This is the first study to demonstrate a placebo effect in neuropathic pain.

Several studies have shown that placebo analgesia effects can be obtained in healthy volunteers, as well as patients suffering from acute postoperative pain and chronic pain conditions such as irritable bowel syndrome. However, it is unknown whether placebo analgesia effects can be elicited in chronic pain conditions with a known pathophysiology such as a nerve injury. Nineteen patients who had developed neuropathic pain after thoracotomy were exposed to a placebo manipulation in which they received either open or hidden administrations of lidocaine. Before the treatment, the patients rated their levels of spontaneous pain and expected pain and completed a questionnaire on their emotional feelings (Positive Affect Negative Affect Schedule) and went through quantitative sensory testing of evoked pain (brush and cold allodynia, heat pain tolerance, area of pinprick hyperalgesia, wind-up-like pain after pinprick stimulation). The placebo manipulation significantly reduced the area of pinprick hyperalgesia ($P=.027$), and this placebo effect was significantly related to low levels of negative affect ($P=.008$; $R^2=0.362$) but not to positive affect or expected pain levels. No placebo effect was observed in relation to spontaneous pain or evoked pain, which is most likely due to low pain levels resulting in floor effects. This is the first study to demonstrate a placebo effect in neuropathic pain. The possible mechanisms underlying the placebo effects in hyperalgesia are discussed, and implications for treatment are outlined.

Pain

Effects of motor cortex modulation and descending inhibitory systems on pain thresholds in healthy subjects □ *The Journal of Pain*, 04/25/2012

Reidler JS et al. – These results suggest that motor cortex modulation may have a greater analgesic effect when combined with bottom–up neuromodulatory mechanisms, presenting new avenues for modulation of pain using noninvasive neuromodulatory approaches.

Pain modulation can be achieved using neuromodulatory tools that influence various levels of the nervous system. Transcranial direct current stimulation (tDCS), for instance, has been shown to reduce chronic pain when applied to the primary motor cortex. In contrast to this central neuromodulatory technique, diffuse noxious inhibitory controls (DNIC) refers to endogenous analgesic mechanisms that decrease pain following the introduction of heterotopic noxious stimuli. We examined whether combining top-down motor cortex modulation using anodal tDCS with a bottom-up DNIC induction paradigm synergistically increases the threshold at which pain is perceived. The pain thresholds of 15 healthy subjects were assessed before and after administration of active tDCS, sham tDCS, cold-water-induced DNIC, and combined tDCS and DNIC. We found that both tDCS and the DNIC paradigm significantly increased pain thresholds and that these approaches appeared to have additive effects. Increase in pain threshold following active tDCS was positively correlated with baseline N-acetylaspartate in the cingulate cortex and negatively correlated with baseline glutamine levels in the thalamus as measured by magnetic resonance spectroscopy. These results suggest that motor cortex modulation may have a greater analgesic effect when combined with bottom-up neuromodulatory mechanisms, presenting new avenues for modulation of pain using noninvasive neuromodulatory approaches.

Perspective

This article demonstrates that both noninvasive motor cortex modulation and a descending noxious inhibitory controls paradigm significantly increase pain thresholds in healthy subjects and appear to have an additive effect when combined. These results suggest that existing pain therapies involving DNIC may be enhanced through combination with noninvasive brain stimulation.

Pain

Pain and the relationship with mood and anxiety disorders and psychological symptoms

□ **Journal of Psychosomatic Research, 04/25/2012**

Williams LJ et al. – This study is consistent with studies utilising clinical samples in reporting that mood and anxiety disorders, as well as psychological symptoms, are associated with higher levels of perceived pain.

Methods

- This study examined the data collected from 1067 women aged 20–93years (median 51years) participating in the Geelong Osteoporosis Study.
- Mood and anxiety disorders were diagnosed using a clinical interview (SCID-I/NP) and psychological symptomatology was assessed using the General Health Questionnaire.
- Pain was determined using a Visual Analogue Scale (0–100mm) and deemed present if score ≥ 40 mm.

Results

- Current mood disorders were associated with an increased likelihood of overall (OR=3.2, 95% CI 2.0-5.1), headache (OR=2.8, 95% CI 1.6-4.8), back (OR=4.0, 95% CI 2.5-6.5) and shoulder pain (OR=2.2, 95% CI 1.2-4.2).
- In those with current mood disorders, the pain interfered with daily activities (OR=3.2, 95% CI 1.9-5.5) and was present most of their time awake (OR=2.5, 95% CI 1.5-4.1).
- This pattern was similarly observed for those with past mood disorders.
- Current anxiety disorders were associated with an increased likelihood for overall (OR=2.2, 95% CI 1.4-3.6), headache (OR=2.2, 95% CI 1.3-4.0), back (OR=1.8, 95% CI 1.1-3.0) and shoulder pain (OR=1.9, 95% CI 1.0-3.5, $p=.05$).
- In those with current anxiety disorders, the pain interfered with daily activities (OR=2.4, 95% CI 1.4-4.1) and was present most of their time awake (OR=1.9, 95% CI 1.2-3.2).
- There was no association between pain and past anxiety.
- Psychological symptomatology was associated with pain at each site (all $p<.001$).

Gait/high heels

Gait Posture. 2012 Apr 18. [Epub ahead of print]

The influence of heel height on patellofemoral joint kinetics during walking.

Ho KY, Blanchette MG, Powers CM.

Source

Jacquelin Perry Musculoskeletal Biomechanics Research Laboratory, Division of Biokinesiology & Physical Therapy, University of Southern California, 1540 E. Alcazar St., CHP-155, Los Angeles, CA 90089-9006, United States.

Abstract

Although wearing high-heeled shoes has long been considered a risk factor for the development for patellofemoral pain (PFP) in women, patellofemoral joint kinetics during high-heeled gait has not been examined. The purpose of this study was to determine if heel height increases patellofemoral joint loading during walking. Eleven healthy women (mean age 25.0 ± 3.1 yrs) participated. Lower extremity kinematics and kinetics were obtained under 3 different shoe conditions: low heel (1.27cm), medium heel (6.35cm), and high heel (9.53cm). Patellofemoral joint stress was estimated using a previously described biomechanical model. Model outputs included patellofemoral joint reaction force, patellofemoral joint stress and utilized contact area as a function of the gait cycle. One-way ANOVAs with repeated measures were used to compare the model outputs and knee joint angles among the 3 shoe conditions. Peak patellofemoral joint stress was found to increase significantly ($p=0.002$) with increasing heel height (low heel: 1.9 ± 0.7 MPa, medium heel: 2.6 ± 1.2 MPa, and high heel: 3.6 ± 1.5 MPa). The increased patellofemoral joint stress was mainly driven by an increase in joint reaction force owing to higher knee extensor moments and knee flexion angles. Our findings support the premise that wearing high-heeled shoes may be a contributing factor with respect to the development of PFP.

Copyright © 2012 Elsevier B.V. All rights reserved

Thoracic spine

J Orthop Sports Phys Ther. 2012 Apr 20. [Epub ahead of print]

Clinical and Radiological Investigation of Thoracic Spine Extension Motion During Bilateral Arm Elevation.

Edmondston SJ, Ferguson A, Ippersiel P, Ronningen L, Sodeland S, Barclay L.

Abstract

STUDY DESIGN:

Single cohort laboratory based study.

OBJECTIVES:

To measure thoracic spine extension motion during bilateral arm elevation using functional radiography and photographic image analysis.

BACKGROUND:

Impairment of thoracic spine extension motion may impact on shoulder girdle function. Motion of the thoracic spine during arm movement has not been directly measured using functional radiographic analysis.

METHODS:

In 21 asymptomatic males, the thoracic kyphosis was measured in neutral standing and in end-range bilateral arm elevation using lateral radiographs and photographic image analysis. Using both measurement techniques, the difference between the two body positions was used to quantify the range of extension motion of the thoracic spine. Bland and Altman plots were used to examine the agreement between measurement techniques. The relationship between the amount of thoracic kyphosis in neutral standing and kyphosis in full bilateral arm elevation was also examined.

RESULTS:

The mean \pm SD increase in thoracic extension with bilateral arm elevation was $12.8\pm 7.6^\circ$ and 10.5 ± 4.4 when measured from the radiographs and photographs, respectively. There was a significant correlation between the radiographic and photographic measurements of the amount of neutral thoracic kyphosis measured in neutral posture ($r=0.71$, $p<0.01$) and for the kyphosis measured while in full bilateral arm elevation ($r=0.82$, $p<0.001$). The mean difference between the 2 measurement techniques was 2.1 degrees for kyphosis measured in neutral posture, and 0.5 degrees when measured in full bilateral arm elevation. The thoracic kyphosis angle measured in neutral posture was strongly correlated with the thoracic kyphosis angle measured in full bilateral arm elevation when measured with both radiographic ($r=0.78$, $p<0.001$) and photographic ($r=0.84$, $p<0.001$) techniques.

CONCLUSION:

In asymptomatic men, bilateral arm elevation is associated with movement of the thoracic spine towards extension but the amount of movement is variable among individuals. J Orthop Sports Phys Ther, Epub 20 April 2012. doi:10.2519/jospt.2012.4164

C spine manip

J Orthop Sports Phys Ther. 2012 Apr 20. [Epub ahead of print]

Short-Term Effects of Kinesiotaping Versus Cervical Thrust Manipulation in Patients With Mechanical Neck Pain: A Randomized Clinical Trial.

Saavedra-Hernández M, Castro-Sánchez AM, Arroyo-Morales M, Cleland JA, Lara-Palomo IC, Fernández-de-Las-Peñas C.

Abstract

STUDY DESIGN:

Randomized clinical trial.

OBJECTIVE:

To compare the effectiveness of cervical spine thrust manipulation and Kinesiotaping® applied to the neck on self-reported pain and disability, and cervical range of motion in individuals with mechanical neck pain.

BACKGROUND:

The effectiveness of cervical manipulation has received considerable attention in the literature. However, because some patients cannot tolerate cervical thrust manipulations, alternative therapeutic options should be investigated.

METHODS:

Eighty patients (36 females) were randomly assigned to 1 of 2 groups: the manipulative group received 2 cervical thrust manipulations, whereas the tape group received Kinesiotaping® applied to the neck. Neck pain (11-point numeric pain rating scale), disability (Neck Disability Index), and cervical range of motion data were collected at baseline and 1 week after the intervention by an assessor blinded to the treatment allocation of the patients. Mixed-model ANOVAs were used to examine the effects of the treatment on each outcome variable with group as the between-subject variable and time as the within-subject variable. The primary analysis was the Group by Time interaction.

RESULTS:

No significant Group by Time interactions were found for pain ($F=1.892$; $P=0.447$) or disability ($F=0.115$; $P=0.736$). The Group by Time interaction was statistically significant for right ($F=7.317$, $P=0.008$) and left ($F=9.525$, $P=0.003$) cervical rotation range of motion with the patients receiving the cervical thrust manipulation experiencing greater improvement in cervical rotation than those treated with Kinesiotape ($P < 0.01$). No significant Group by Time interactions were found for cervical spine range of motion for flexion ($F=0.944$; $P=0.334$), extension ($F=0.122$; $P=0.728$), and right ($F=0.220$; $P=0.650$) and left ($F=0.389$, $P=0.535$) lateral-flexion.

CONCLUSIONS:

Patients with mechanical neck pain receiving cervical thrust manipulation or treated with Kinesiotaping® exhibited similar reductions in neck pain intensity and disability and similar changes in active cervical range of motion except for rotation. Changes in neck pain surpassed the minimal clinically important difference (MCID), whereas changes in disability did not. Changes in cervical range of motion were small and not clinically meaningful. Because we did not include a control or placebo group in this study, we cannot rule out placebo effect or natural changes over time as potential reasons for the improvements measured in both groups.

LEVEL OF EVIDENCE:

Therapy, Level 1b. J Orthop Sports Phys Ther, Epub 20 April 2012. doi:10.2519/jospt.2012.4086

Cancer

Investigation of nonmechanical findings during spinal movement screening for identifying and/or ruling out metastatic cancer □ Pain Practice, 04/30/2012

Cook C et al. – Nonmechanical findings during a traditional movement screen are not specific to sinister conditions such as metastatic spinal cancer. Clinicians should expect concomitant conditions to exhibit painful or limited findings in patients with and without cancer.

Methods

- This study included 1,109 patients (655 women) with low back pain (mean age = 54.8 ± 16.3 years) seen at a spine surgery center who received a clinical movement screen and an imaging-supported diagnosis by an orthopedic surgeon.
- No report of pain during movement and no limitation of movement were considered the 2 targeted findings as these are associated with nonmechanical findings.

Results

- Sixty-six patients were diagnosed with metastatic cancer, 61 with metastatic bone cancer and concomitant diagnoses.
- Pain-free lumbar movements in all directions for patients with metastatic bone cancer without concomitant diagnoses were associated with a posttest probability of 0.00 (+likelihood ratio = 2.4; –likelihood ratio = 0.0), which may be useful in ruling out spinal cancer.

In situations where a concomitant diagnosis was present with cancer, the value of a movement screen was poor.

Fibromyalgia

The impact of mood, anxiety, and sleep disorders on fibromyalgia □ Comprehensive Psychiatry, 04/30/2012 Clinical Article

Consoli G et al. – Psychiatric comorbidity, in particular with mood disorders, provokes a significant impairment of the health-related quality of life and, when current, a higher severity of pain in fibromyalgia patients.

Methods

- One-hundred and sixty-seven women suffering from primary FM were consecutively enrolled.
- Psychiatric diagnoses were made by means of DSM-IV criteria.
- The HRQoL and the severity of pain were measured through the Medical Outcomes Study 36-item Short-Form Health Survey (MOS-SF-36) and the FM Impact Questionnaire (FIQ).

Results

- Fibromyalgia patients showed a high rate (80.8%) of lifetime and/or current comorbidity with mood and anxiety disorders.
- Patients with psychiatric comorbidity resulted significantly more impaired on the Mental Component Summary score of the MOS-SF-36 and showed a higher FIQ total score than those suffering from FM only.
- The severity of pain was associated with current psychiatric comorbidity.
- Patients with current mood disorders showed significantly lower Mental and Physical Component Summary scores of the MOS-SF-36 and higher FIQ total scores than those with current anxiety disorders or those without psychiatric comorbidity.
- Finally, patients with sleep disorders reported a lower HRQoL than those with a normal sleep, and specifically those with difficulty in falling in sleep had higher severity of pain.
 - Results
 - Fibromyalgia patients showed a high rate (80.8%) of lifetime and/or current comorbidity with mood and anxiety disorders. Patients with psychiatric comorbidity resulted significantly more impaired on the Mental Component Summary score of the MOS-SF-36 and showed a higher FIQ total score than those suffering from FM only. The severity of pain was associated with current psychiatric comorbidity. Patients with current mood disorders showed significantly lower Mental and Physical Component Summary scores of the MOS-SF-36 and higher FIQ total scores than those with current anxiety disorders or those without psychiatric comorbidity. Finally, patients with sleep disorders reported a lower HRQoL than those with a normal sleep, and specifically those with difficulty in falling in sleep had higher severity of pain.
 - Conclusion
 - Psychiatric comorbidity, in particular with mood disorders, provokes a significant impairment of the HRQoL and, when current, a higher severity of pain in FM patients.

Hip

Am J Sports Med. 2012 Apr 20. [Epub ahead of print]

Recruitment and Activity of the Pectineus and Piriformis Muscles During Hip Rehabilitation Exercises: An Electromyography Study.

Giphart JE, Stull JD, Laprade RF, Wahoff MS, Philippon MJ.

Source

Steadman Philippon Research Institute, Vail, Colorado.

Abstract

Background: The pectineus muscle has been reported to function primarily as a hip flexor and secondarily as a hip internal rotator; the piriformis muscle has been reported to function as an abductor and external rotator of the hip. The recruitment and activations of these muscles during hip rehabilitation exercises have not been detailed. **Hypothesis:** The authors hypothesized that they would measure the highest pectineus activation during exercises involving hip flexion, with moderate pectineus activation during exercises with hip internal rotation. They also hypothesized that they would measure the highest piriformis activation during exercises involving hip abduction and/or external rotation. **Study Design:** Descriptive laboratory study. **Methods:** Ten healthy volunteers completed 13 hip rehabilitation exercises with electromyography (EMG) electrodes inserted under ultrasound guidance into the pectineus and piriformis muscle bellies. The EMG signals were recorded and exercise activation levels were reported as a percentage of a maximum voluntary contraction (MVC). **Results:** Both the highest peak pectineus activation ($62.8\% \pm 26.6\%$ MVC) and the highest mean pectineus activation ($33.1\% \pm 17.4\%$ MVC) were measured during the supine hip flexion exercise. Moderate activation was found during the single- and double-legged bridge and both phases of the stool hip rotation exercise. The highest peak piriformis activation was observed in the single-legged bridge (MVC, $35.7\% \pm 25.7\%$), and the highest mean piriformis activation was observed in the prone heel squeeze (MVC, $24.3\% \pm 8.2\%$). Similar moderate activation levels were found for single-legged hip abduction and resisted hip extension. **Conclusion:** The pectineus was highly activated during hip flexion exercises and moderately activated during exercises requiring rotational hip stabilization in either direction, rather than with internal hip rotation only. The piriformis was most activated during static external rotation and abduction while the participants' hips were in slight extension. These observations indicate that the pectineus and piriformis are both muscles that contribute to hip stabilization. **Clinical Relevance:** The findings indicate that the pectineus and piriformis function as hip-stabilizing muscles and can be used to specifically address pectineus and piriformis muscle rehabilitation. The authors believe that strengthening and conditioning of these muscles should aid in the restoration of hip function and stability after injury or arthroscopic surgery.

PMID: 22523373 [PubMed - as supplied by publisher]

Knee/Patella

Br J Sports Med. 2012 Mar;46(4):243-6. Epub 2011 Feb 25.

Knee arthroscopy and exercise versus exercise only for chronic patellofemoral pain syndrome: 5-year follow-up.

Kettunen JA, Harilainen A, Sandelin J, Schlenzka D, Hietaniemi K, Seitsalo S, Malmivaara A, Kujala UM.

Source

Arcada University of Applied Sciences, Jan-Magnus Janssonin aukio 1, Helsinki, Finland.
jyrki.kettunen@arcada.fi

Abstract

OBJECTIVE:

To study the long-term outcome of arthroscopy in patients with chronic patellofemoral pain syndrome (PFPS), the authors conducted a randomised controlled trial. The authors also investigated factors predicting the outcome in patients with PFPS.

METHODS:

Fifty-six patients with PFPS were randomised into two groups: an arthroscopy group (N=28), treated with knee arthroscopy and an 8-week home exercise programme, and a control group (N=28), treated with a similar 8-week home exercise programme only. The primary outcome was the Kujala score on pain and function at 5-year. Secondary outcomes were visual analogue scales (VASs) to assess activity-related symptoms.

RESULTS:

According to the Kujala score, both groups showed a marked improvement during the 5-year follow-up: a mean improvement of 14.7 (95% CI 9.9 to 19.4) in the arthroscopy group and 13.5 (95% CI 8.1 to 18.8) in the controls. No differences between the groups in mean improvement in the Kujala score (group difference 1.2 (95% CI -8.4 to 6.1)) or in the VAS scores were found. None of the investigated factors predicted the long-term outcome, but in most of the cases the treatment result immediately after the exercise programme remained similar also after the 5-year follow-up.

CONCLUSION:

Our RCT, being the first of its kind, indicates that the 5-year outcome in most of the patients with chronic PFPS treated with knee arthroscopy and home exercise programme or with the home exercise programme only is equally good in both groups. Some of the patients in both groups do have long-term symptoms.

PMID: 21357578 [PubMed - indexed for MEDLINE]

Manipulation

J Electromyogr Kinesiol. 2012 Apr 16. [Epub ahead of print]

The basis for spinal manipulation: Chiropractic perspective of indications and theory.

Henderson CN.

Source

Palmer Center for Chiropractic Research, FL, United States.

Abstract

It is reasonable to think that patients responding to spinal manipulation (SM), a mechanically based therapy, would have mechanical derangement of the spine as a critical causal component in the mechanism of their condition. Consequently, SM practitioners routinely assess intervertebral motion, and treat patients on the basis of those assessments. In chiropractic practice, the vertebral subluxation has been the historical *raison d'être* for SM. Vertebral subluxation is a biomechanical spine derangement thought to produce clinically significant effects by disturbing neurological function. This paper reviews the putative mechanical features of the subluxation and three theories that form the foundation for much of chiropractic practice. It concludes with discussion of subluxation as an indicator for SM therapy, particularly from the perspective that subluxation may be one contributory cause of ill-health within a "web of causation".

Copyright © 2012 Elsevier Ltd. All rights reserved.

PMID: 22513367 [PubMed - as supplied by publisher]

Manipulation/Multifidus

J Electromyogr Kinesiol. 2012 Apr 17. [Epub ahead of print]

Association between history and physical examination factors and change in lumbar multifidus muscle thickness after spinal manipulation in patients with low back pain.

Koppenhaver SL, Fritz JM, Hebert JJ, Kawchuk GN, Parent EC, Gill NW, Childs JD, Teyhen DS.

Source

U.S. Army-Baylor University, Doctoral Program in Physical Therapy, San Antonio, TX, USA; Faculty, School of Chiropractic and Sports Science, Murdoch University, Perth, Australia.

Abstract

Understanding the clinical characteristics of patients with low back pain (LBP) who display improved lumbar multifidus (LM) muscle function after spinal manipulative therapy (SMT) may provide insight into a potentially synergistic interaction between SMT and exercise. Therefore, the purpose of this study was to identify the baseline historical and physical examination factors associated with increased contracted LM muscle thickness one week after SMT. Eighty-one participants with LBP underwent a baseline physical examination and ultrasound imaging assessment of the LM muscle during submaximal contraction before and one week after SMT. The relationship between baseline examination variables and 1-week change in contracted LM thickness was assessed using correlation analysis and hierarchical multiple linear regression. Four variables best predicted the magnitude of increases in contracted LM muscle thickness after SMT. When combined, these variables suggest that patients with LBP, (1) that are fairly acute, (2) have at least a moderately good prognosis without focal and irritable symptoms, and (3) exhibit signs of spinal instability, may be the best candidates for a combined SMT and lumbar stabilization exercise (LSE) treatment approach.

Published by Elsevier Ltd.

PMID: 22516351 [PubMed - as supplied by publisher]

Stretching

Muscle Nerve. 2012 Mar;45(3):367-75. doi: 10.1002/mus.22286.

Preserving sarcomere number after tenotomy requires stretch and contraction.

Van Dyke JM, Bain JL, Riley DA.

Source

Department of Cell Biology, Neurobiology & Anatomy, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, Wisconsin 53226, USA.

Abstract

INTRODUCTION:

Passive stretch therapy is utilized to improve the range of motion of chronically shortened muscles. However, human studies show conflicting results as whether passive stretch is clinically effective.

METHODS:

The soleus muscles of adult rats were tenotomized to induce muscle shortening adaptation. Muscles included were non-treated normal, subjected to daily static stretch, or lengthened and isometrically contracted for 20 min/day. Muscle fiber structure was analyzed histochemically. Sarcomeres per millimeter length were counted to assess the effect of treatment.

RESULTS:

Passive stretch significantly reduced central core lesion formation, but sarcomere loss was not prevented. The addition of isometric contraction during static stretch significantly ($P < 0.001$) reduced sarcomere loss.

CONCLUSIONS:

Passive stretch alone does not prevent shortening adaptation. Contraction is required in combination with stretch to preserve the number of sarcomeres in series. The combination of stretch and contraction is necessary to maintain proper muscle fiber length.

Copyright © 2011 Wiley Periodicals, Inc.

PMID: 22334171 [PubMed - indexed for MEDLINE]

Neural tension

Arch Phys Med Rehabil. 2012 Mar;93(3):396-403. Epub 2012 Jan 2.

Radial nerve mobilization decreases pain sensitivity and improves motor performance in patients with thumb carpometacarpal osteoarthritis: a randomized controlled trial.

Villafañe JH, Silva GB, Bishop MD, Fernandez-Carnero J.

Source

Department of Physical Therapy, Residenze Sanitarie Assistenziali A. Maritano, Sangano, Italy.
mail@villafane.it

Abstract

OBJECTIVE:

To examine the effects of radial nerve mobilization on pain sensitivity and motor performance in subjects with secondary thumb carpometacarpal osteoarthritis.

DESIGN:

Randomized controlled trial. Treatment and placebo were given for 4 weeks. Measurements were taken before intervention, after 1 month (first follow-up), and after 2 months (second follow-up).

SETTING:

Patients from the Department of Physical Therapy, Azienda Sanitaria Locale 3, Collegno (Italy).

PARTICIPANTS:

Participants (N=60; age range, 70-90y) with right-dominant hand secondary thumb carpometacarpal osteoarthritis without other motor-related pathology. All patients completed the study. No patients were withdrawn from the study.

INTERVENTIONS:

Sliding mobilization of the proximal-distal radial nerve or intermittent ultrasound therapy, used as placebo.

MAIN OUTCOME MEASURES:

We hypothesized that radial nerve mobilization induces hypoalgesia and increases strength in secondary thumb carpometacarpal osteoarthritis. We measured pressure pain threshold (PPT) at the trapeziometacarpal joint, the tubercle of the scaphoid bone, and the unciform apophysis of the hamate bone by algometry. Tip pinch strength and tripod pinch strength were measured by a mechanical pinch gauge.

RESULTS:

Treatment increased PPT by $3.33 \pm .24$ kg/cm² ($P < .001$) in the trapeziometacarpal joint and was maintained until first follow-up and second follow-up. Also, PPT in the scaphoid bone and hamate bone was increased ($P < .001$ and $P < .02$, respectively). Variables in the placebo group remained unchanged. Tip pinch strength increased by $2.22 \pm .22$ kg ($P < .04$) and tripod pinch strength by $2.83 \pm .24$ kg ($P < .019$).

CONCLUSIONS:

Radial nerve mobilization decreases pain sensitivity in the trapeziometacarpal joint and increases tip pinch strength.

Copyright © 2012 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved

STM

J Bodyw Mov Ther. 2012 Jan;16(1):83-93. Epub 2010 Sep 27.

A theoretical framework for the role of fascia in manual therapy.

Simmonds N, Miller P, Gemmell H.

Source

Anglo-European College of Chiropractic, 13-15 Parkwood Road, Bournemouth BH5 2DF, United Kingdom.

Abstract

A theoretical framework for the role that fascia may play in apparently diverse passive manual therapies is presented. The relevant anatomy of fascia is briefly reviewed. Therapies are divided into myofascial ('soft tissue') and manipulative ('joint-based') and comparisons are made between them on a qualitative basis using measures of pain, function and 'autonomic activation'. When these three outcomes are evaluated between therapies it is observed that they are usually comparable in the quality, if not the quantity of the measures. Viewed from a patients' perspective alone the therapeutic benefits are hard to distinguish. It is proposed that a biologically plausible mechanism which may generate a significant component of the observed effects of manual therapies of all descriptions, is the therapeutic stimulation of fascia in its various forms within the body. Such considerations may help explain why diverse therapies apparently give comparable results.

Copyright © 2010 Elsevier Ltd. All rights reserved.

PMID: 22196432 [PubMed - indexed for MEDLINE]

Manipulation

J Bodyw Mov Ther. 2012 Jan;16(1):29-35. Epub 2011 Mar 11.

The effect of two manipulative therapy techniques and their outcome in patients with sacroiliac joint syndrome.

Kamali F, Shokri E.

Source

Center for Human Movement Science Research, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, P.O. Box 71347-1733, Shiraz 71947-33669, Iran.
fahimehkamali@hotmail.com

Abstract

OBJECTIVES:

To compare the effect of sacroiliac joint (SIJ) manipulation with SIJ and lumbar manipulation for the treatment of SIJ syndrome.

METHODS:

Thirty-two women with SIJ syndrome were randomly divided into two groups of 16 subjects. One group received the high-velocity low-amplitude (HVLA) manipulation to the SIJ and the other group received both SIJ and lumbar HVLA manipulation to both the SIJ and lumbar spine in a single session. The outcomes were assessed using visual analogue scale (VAS) at baseline, immediately, 48 h and one month after the treatment for pain and also Oswestry Disability Index (ODI) questionnaire at baseline, 48 h and one month after the treatment.

RESULTS:

Analysis revealed a statistically significant improvement immediately, at 48 h and one month after treatment for pain and significant improvement at 48 h and one month after treatment for functional disability in the SIJ manipulated group. A significant improvement immediately, at 48 h and one month after treatment for pain and significant improvement at 48 h and one month after treatment for functional disability in the SIJ and lumbar manipulated group was also found. Furthermore, there were significant differences within groups in ODI and VAS when using Friedman test in both groups. By using Wilcoxon rank sum test no differences were observed in change scores between the two groups immediately, 48 h and one month after the treatment for VAS, or after 48 h and one month after the treatment for the ODI.

CONCLUSION:

A single session of SIJ and lumbar manipulation was more effective for improving functional disability than SIJ manipulation alone in patients with SIJ syndrome. Spinal HVLA manipulation may be a beneficial addition to treatment for patients with SIJ syndrome.

Copyright © 2011 Elsevier Ltd. All rights reserved.

PMID: 22196424 [PubMed - indexed for MEDLINE]