

SportsMed Update

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In a small non-randomized clinical trial, extracorporeal shock wave treatment significantly promoted angiogenesis and bone remodelling in patients with osteonecrosis of the femoral head

Title: Extracorporeal shockwave therapy shows regeneration in hip necrosis

Authors: Wang C-J, Wang F-S, Ko J-Y, Huang H-Y, Chen C-J, Sun Y-C, Yang Y-J

Reference: Rheumatology 2008; 47: 542-546

Type of study: Non randomized, clinical trial

Keywords: hip, joint, osteonecrosis, extracorporeal shockwave, regeneration, angiogenesis, femoral head

EB Rating: 7.5/10

CI Rating: 8/10

Background: Extracorporeal shockwave therapy (ECSWT) has shown some promising results in the treatment of a number of chronic musculoskeletal conditions – recently, ECSWT has been suggested for hip necrosis

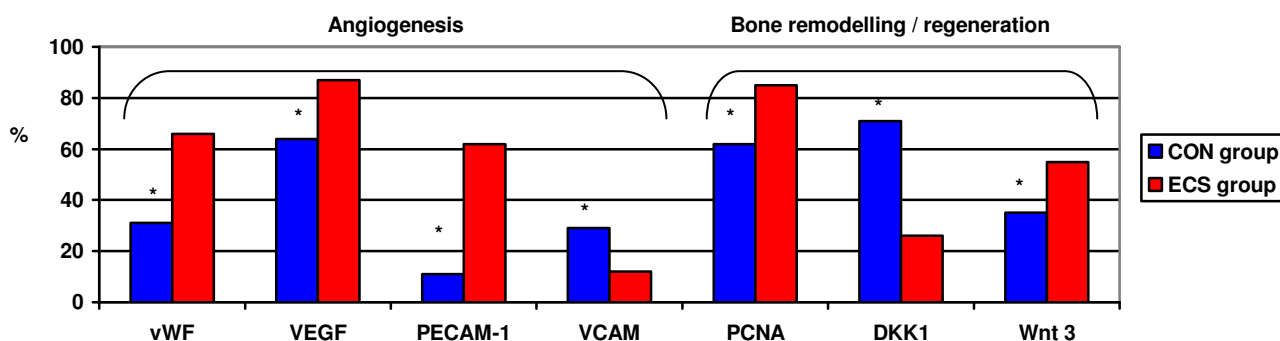
Research question/s: Does ECSWT improve angiogenesis and bone remodelling in patients with osteonecrosis of the femoral head (ONFH)?

Methodology:

- Subjects: 14 patients (male=11) (19-57 yrs) undergoing total hip arthroplasty for ONFH
- Experimental procedure: In a non randomized fashion two groups (similar demographics, duration and stage of lesion) were studied: 7 subjects who received ECSWT prior to surgery (ECS group; 1500 impulses at 28kV, 6000 shocks under imaging guidance), and 7 subjects not receiving ECSWT (CON group). The femoral heads were investigated with histopathological examination and immunohistochemical analysis for angiogenesis and bone modelling and regeneration
- Measures of outcome: Histopathological analysis, angiogenesis (von Willebrand factor = vWF, VEGF, platelet endothelial cell adhesion molecule-1 = PECAM-1 also referred to as (CD 31) and vascular cell adhesion molecule = VCAM), bone remodeling and regeneration (proliferation cell nuclear antigen = PCNA, Dickkopf-1 = DKK1 and Wntless 3a = Wnt 3)

Main finding/s:

- Histopathology: There was significantly more viable bone, less necrotic bone, higher cell concentration and more cell activities (phagocytosis) in the ECS group compared with the CON group



Conclusion/s:

- In a small non-randomized clinical trial, extracorporeal shock wave treatment significantly promoted angiogenesis and bone remodeling in patients with osteonecrosis of the femoral head

Methodological considerations:

Well conducted, small sample size, non randomization, limited outcome variables

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The histological and ultrastructural appearance of patellar tendons, where the central third was used for anterior cruciate ligament revision surgery, had not normalized after 10 years

Title: A histological and ultrastructural evaluation of the patellar tendon 10 years after reharvesting its central third

Authors: Liden M, Movin T, Ejerhed L, Papadogiannakis N, Blomen E, Hultenby K, Kartus J

Reference: Am J Sports med 2008; 36(4): 781-788

Type of study: Case-control study

Keywords: knee, injury, anterior cruciate ligament (ACL), surgery, patellar tendon

EB Rating: 7/10

CI Rating: 7/10

Background: This study was undertaken to evaluate the histological and ultrastructural characteristics of the patellar tendon 10 years after reharvesting its central third

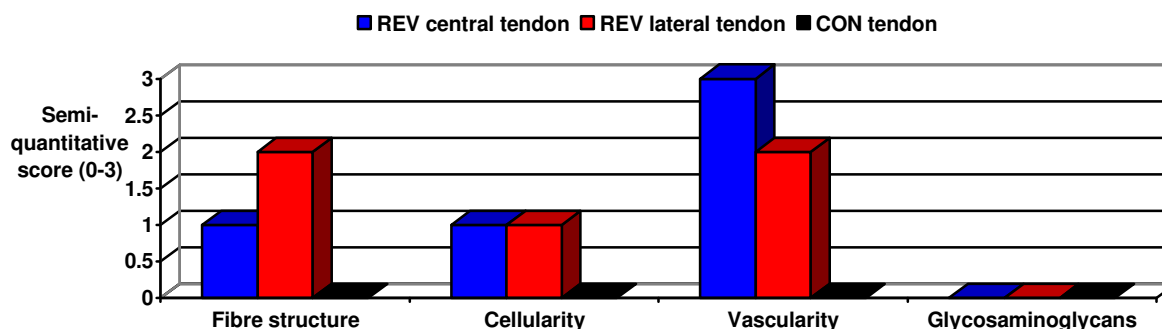
Research question/s: In the long term, after its central third is reharvested, the patellar tendon does not regain a normal histological and ultrastructural appearance?

Methodology:

- Subjects: 12 patients (REV group, female=4, 23-39 yrs) who underwent anterior cruciate ligament (ACL) revision surgery using reharvested ipsilateral patellar tendon autografts and 11 patients (CON group, female=1, 19-40 yrs) who underwent first time ACL reconstruction
- Experimental procedure: Biopsy samples were obtained from both groups from the central and lateral parts of the patellar tendon (REV group - percutaneous samples under ultrasonographic guidance, 116 months after the revision procedure; CON group - at time of open ACL reconstruction) and analyzed
- Measures of outcome: Histological, glycosaminoglycans, ultrastructure (transmission electron microscope) in the central and lateral patellar tendon samples using a semi-quantitative 4 point (0-3) scoring system

Main finding/s:

- Histological evaluation: In the REV group, there was evidence of deterioration in fiber structure, increased cellularity, and increased vascularity in both the central and peripheral parts of the patellar tendon specimens
- Ultrastructure: In the REV group there was a pathological cell appearance, a more heterogeneous extracellular matrix, and a more homogeneous distribution of all fibril sizes (lateral tendon)
- Glycosaminoglycans: No difference between groups



Conclusion/s:

- The histological and ultrastructural appearance of patellar tendons, where the central third was used for anterior cruciate ligament revision surgery, had not normalized after 10 years

Methodological considerations:

Case control design – no cause effect, good long term follow-up

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Of the two clinical tests that can be used to diagnose a lumbar disc herniation, the Slump test is more sensitive (0.84) compared with the straight leg raise (SLR) test (0.52) – the specificity of the two tests is similar (0.83 vs. 0.89)

Title: The sensitivity and specificity of the slump and the straight leg raising tests in patients with lumbar disc herniation

Authors: Majlesi J, Togay H, Unalan H, Toprak S

Reference: J Clin Rheumatol 2008; 14(2): 87-91

Type of study: Diagnostic test evaluation

Keywords: lower back, injury, lumbar disc, herniation, clinical assessment, Slump test, Straight Leg Raising test

EB Rating: 7/10

CI Rating: 7.5/10

Background: Two clinical tests have been used to make a clinical diagnosis of a lumbar disc herniation - the straight leg raise (SLR) test and the slump test (a variant of the SLR and the Lasegue's tests that is performed in the seated position and is characterized by a progressive series of maneuvers designed to place the sciatic nerve roots under increasing tension)

Research question/s: What is the sensitivity and specificity of the Slump test when compared with the straight leg raise (SLR) test in patients with and without lumbar disc herniation (diagnosed using MRI)?

Methodology:

- Subjects: 75 patients with clinical history suggestive of lumbar disc herniation
- Experimental procedure: All the subjects presented with lower back pain, leg pain, or lower back and leg pain. All the subjects underwent Magnetic Resonance Imaging (MRI) of the lumbar spine and were then divided into a disc herniation group (DISC=38) or a control (CON=37) group based on the MRI findings. Both the Slump and SLR tests were performed during the assessment of all the patients
- Measures of outcome: Sensitivity and specificity of the Slump and SLR tests for disc herniation

Main finding/s:

	Sensitivity	Specificity
SLR test	0.52	0.89
Slump test	0.84	0.83

Conclusion/s:

- Of the two clinical tests that can be used to diagnose a lumbar disc herniation, the Slump test is more sensitive (0.84) compared with the straight leg raise (SLR) test (0.52) – the specificity of the two tests is similar (0.83 vs. 0.89)

Methodological considerations:

Well conducted study

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In a prospective cohort study, a high calcium intake appears to slow the decline in trochanteric bone mineral content in premenopausal women, while a high level of physical activity was beneficial for proximal femur bone mineral content particularly among older women

Title: Influence of calcium intake and physical activity on proximal femur bone mass and structure among pre- and postmenopausal women. A 10-year prospective study

Authors: Uusi-Rasi K., Sievanen H, Pasanen M, Beck TJ, Kannus P

Reference: Calcif Tissue Int 2008; 82: 171-181

Type of study: Prospective cohort study

Keywords: bone mass, bone strength, calcium intake, osteoporosis, physical activity

EB Rating: 7/10

CI Rating: 7/10

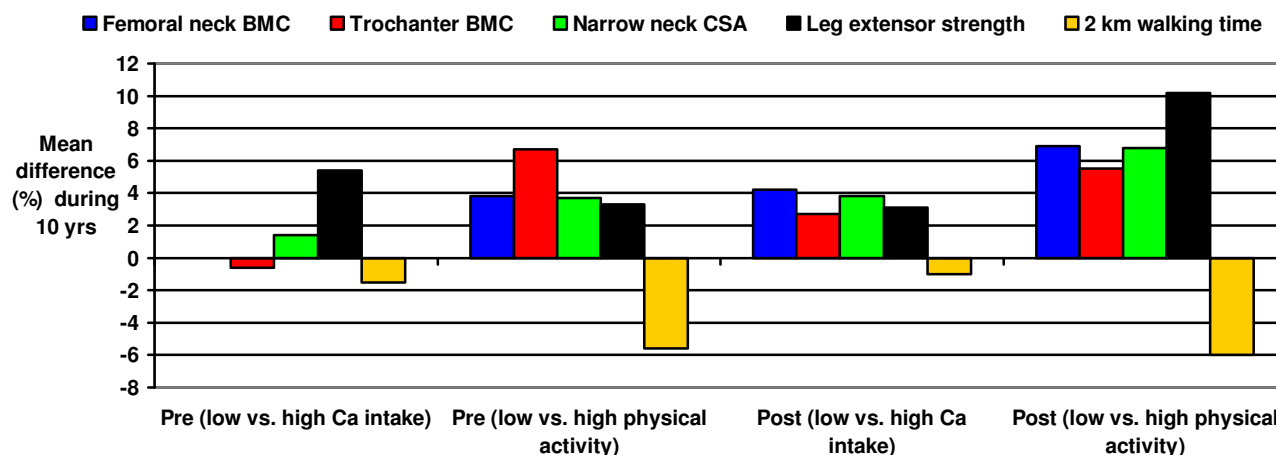
Background: Both calcium intake and physical activity can affect bone mass and structure, and this may differ in pre- vs., post-menopausal women

Research question/s: What is the effect of physical activity and calcium intake on proximal femur bone mass (BMC), bone structural indices (CSA and Z) and physical performance (muscle strength and endurance)?

Methodology:

- Subjects: 133 premenopausal (Pre: 25-30 yrs) and 134 postmenopausal women (Post: 60-65 yrs) at baseline
- Experimental procedure: All the subjects were assessed at baseline [calcium intake, physical activity, muscle strength, endurance, femoral DXA (bone mineral content, bone cross sectional area)] and then followed up at 5 and 10 yrs. Subjects in the Pre and Post groups were divided into 4 groups according to calcium intake (high>1200mg/day, low<800mg per day) and physically activity (high=vigorous activity >2/wk or low)
- Main measures of outcome: Femoral neck and trochanter bone mineral content (BMC), narrow neck cross sectional area (CSA). Other measures: Leg extensor and arm strength, 2 km walking time (min), VO2max

Main finding/s:



Conclusion/s:

- In a prospective cohort study, a high calcium intake appears to slow the decline in trochanteric bone mineral content in premenopausal women, while a high level of physical activity was beneficial for proximal femur bone mineral content particularly among older women

Methodological considerations:

Calcium intake was estimated, exercise intensity was not documented, sample size limited, subjects not randomly recruited

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Both reduced leisure-time physical activity and increased sedentary behaviour are associated with an increased incidence of mental disorders in middle-aged university graduates

Title: Physical activity, sedentary index, and mental disorders in the SUN cohort study

Authors: Sanchez-Villegas A, Ara I, Guillen-Grima F, Bes-Rastrollo M, Varo-Cenarruzabeitia JJ, Martinez-Gonzalez M

Reference: Med Sci Sports Exerc 2008; 40(5): 827-834

Type of study: Prospective cohort study

Keywords: mental disorders, exercise, depression, anxiety

EB Rating: 7.5/10

CI Rating: 8/10

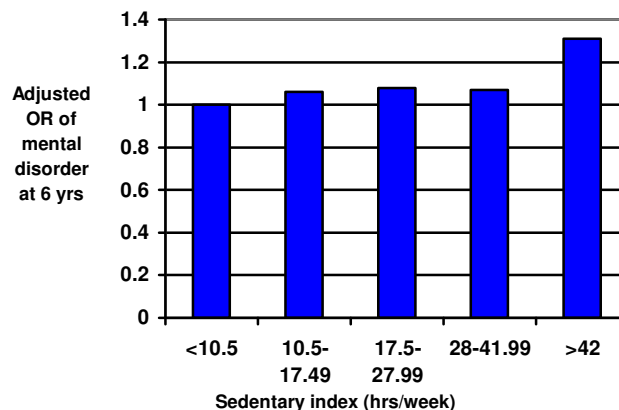
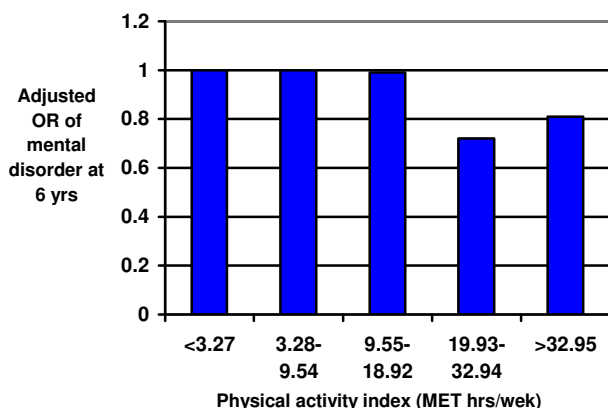
Background: It has been suggested that participation in regular physical activity may be of benefit in reducing the incidence of several mental disorders

Research question/s: What is the association between low levels of leisure time physical activity (sedentary lifestyle) and the incidence of mental disorders?

Methodology:

- Subjects: 10 381 university graduates (who were part of a prospective cohort study - SUN study)
- Experimental procedure: All the subjects were assessed at baseline (validated questionnaire on physical activity during leisure-time and sedentary activities) and then followed for 6 years using questionnaires for the presence of a mental disorder (classified as an incident case if he or she reported a physician diagnosis of depression, anxiety or stress, and/or the use of antidepressant medication or tranquilizers in at least one of the questionnaires)
- Measures of outcome: Odds ratio of mental disorder in physical activity categories (MET hrs/wk) and sedentary index (sedentary hours/wk) categories (multivariate analysis)

Main finding/s:



Conclusion/s:

- Both reduced leisure-time physical activity and increased sedentary behaviour are associated with an increased incidence of mental disorders in middle-aged university graduates

Methodological considerations:

Study population not representative of the general population

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