12 weeks. No change in medication was allowed during this time. ANS function and balance were determined by quantification of the variability of the inter-beat interval detected with the Polar 810i heart rate monitor system. Frequency domain analyses were used for quantification, including LF (ms²) – indicating mainly sympathetic influence, HF (ms²) – indicating parasympathetic influence, and LF/HF – indicator of autonomic balance.

Results: The two groups matched regarding baseline demographic data (age, sex, disease activity, disease duration). Due to small sample sizes and variables not following a normal distribution, non-parametric Mann Whitney U analyses were performed on the heart rate variability parameters. Comparing posture change (i.e. standing value minus supine value) from pre- to post intervention, all frequency domain parameters changed as anticipated (i.e. vagal withdrawal and increased sympathetic influence) for the RAE group. For the RAC group the measurements deteriorated.

LF (ms²): RAE -1.03 to 22.03 (stronger sympathetic influence); RAC 43.45 to -31.21 (weaker sympathetic influence)

HF (ms²): RAE -24.03 to -33.34 (better vagal withdrawal); RAC -191.7 to -114.1 (less vagal withdrawal)

LF/HF: RAE 10.57 to 15.04; RAC 2.9 to 7.6

Conclusions: From these preliminary results it appear that exercise may indeed improve autonomic function in RA patients, in such a way that posture change will not be an added burden for falls in an already otherwise compromised population.

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FRI0683 INVESTIGATION OF THE RELATIONSHIP BETWEEN PLANTAR PRESSURE DISTRIBUTION AND LUMBAR MULTIFIDUS MUSCLE THICKNESS

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Background: Lumbar multifidus is a muscle which is responsible for lumbopelvic stability primarily. Foot-ankle posture and function disorders affecting the lumbopelvic region muscles and biomechanics, cause increased stress in the lumbopelvic region and may cause low back pain in many studies (1,2,3). However, it is not known whether the lumbar multifidus muscle is affected by this condition (4,5).

Objectives: Plantar pressure distribution can change due to foot-ankle postural disorders. Our aim is to examine whether the plantar pressure distribution affects the lumbar multifidus muscle thickness.

Methods: 40 healthy young adults aged 18 to 25 years were included in the study. Static and dynamic pedobarographic assessments were performed to determine the plantar pressure distribution, on a 3x1 meter sensed walking platform with the DIASU Digital Analysis System®. Peak pressures (N/cm²) of 9 zones of the foot (medial of heel, lateral of foot, 5 metatarsal, thumb and 2.3.4 and 5. digits) were recorded. Ultrasonographic imaging was used to assess lumbar multifidus muscle thickness.

Results: There was statistically significant correlation between lumbar multifidus muscle thickness and peak pressure medial of heel and 1. metatarsal bone in static pedobarographic analysis (p<0.05). As the peak pressure on the medial part of foot increased, m. lumbar multifidus muscle thickness was reduced. There was statistically significant correlation between lumbar multifidus muscle thickness and pressure medial of heel and 2.3.4. and 5. digits in dynamic pedobarographic analysis (p<0.05). As the peak pressure on the medial part of foot increased, m. lumbar multifidus muscle thickness was reduced.

Conclusions: Our results show that plantar pressure distribution affected lumbar multifidus muscle thickness. Based on these results, the lumbopelvic region and foot posture should be considered together in therapeutic interventions.

REFERENCES:

1. Bird AR, Payne CB. Foot function and low back pain. *Foot* 1999;9(4):175–80.
2. Botte RR. An interpretation of the pronation syndrome and foot types of patients with low back pain. *J Am Podiatry Assoc* 1981;71(5):243–53.
3. Barwick A, Smith J, Chuter V. The relationship between foot motion and lumbopelvic-hip function: a review of the literature. *Foot (Edinb)* 2012;22(3):224–31.
4. Brantingham JW, Adams KJ, Cooley JR, Globe D, Globe G. A single-blind pilot study to determine risk and association between navicular drop, calcaneal eversion and low back pain. *J Manipulative Physiol Ther* 2007;30(5):380–5.
5. Fourchet F, Kelly L, Horobeanu C, Loepelt H, Taiar R, Millet G. High-intensity running and plantar-flexor fatigability and plantar-pressure distribution in adolescent runners. *J Athl Train* 2015;50(2):117–25.

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FRI0684 EFFICIENCY OF COMPLEX REHABILITATION PROGRAM IN PATIENTS WITH RHEUMATOID ARTHRITIS RECEIVING ABATACEPT

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Background: Rehabilitation techniques (physical exercises, physiotherapy, occupational therapy, patient education) help to manage rheumatoid arthritis (RA) in addition to drug treatment [1–4].

Objectives: To evaluate the efficiency of 12-month complex rehabilitation program in patients with RA receiving abatacept.

Methods: 50 patients with RA (94% females, 72% with moderate disease activity by DAS28, age of 18 to 57 years, disease duration of 10 months to 12 years) were included and randomized into 2 groups. All patients received abatacept (intravenously 10 mg/kg (mean 750 mg) once every 4 weeks or subcutaneously 125 mg once a week) with methotrexate 20–25 mg per week. 28 study group patients underwent 12-months complex rehabilitation program: laser therapy of 12 to 16 min (infrared low intensity laser radiation, wavelength of 0,89 micrometers, pulse frequency of 1000 to 1500 Hz) for hand, knee, ankle, shoulder and elbow joints, 3 courses for 14 sessions with a mean interval of 3,2 months; 45-min dynamic exercises using gym apparatus Enraf-Nonius under the supervision of a trainer 3 times a week; 45-min exercises for hands 3 times a week; 45-min occupational therapy (joint protection strategies, use of assistive devices and adaptive equipment), 10 sessions; wrist, ankle and knee orthoses, orthopedic insoles; education program (4 daily 90-min studies). 22 patients received only drug therapy (control). Tender and swollen joint count, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), joint pain on 100-mm VAS, DAS28, HAQ, RAPID3, hand grip strength, the average powers of knee extension and ankle flexion by EN-TreeM movement analysis were evaluated at baseline and at 12 months.

Results: After 12 month in the study group tender joint count decreased by 69,3% (p<0,01), swollen joint count – by 66,2% (p<0,01), ESR – by 63,7% (p<0,01), CRP – by 58,5% (p<0,01), pain on VAS – by 82,3% (p<0,01), DAS28 – by 39,6% (ΔDAS28=2,89±0,99, p<0,05), HAQ – by 72,2% (ΔHAQ=1,73±0,44, p<0,01), RAPID3 – by 78,3% (ΔRAPID3=8,45±0,85, p<0,01). The grip strength of a more affected hand enhanced by 57,1% (p<0,01), of a less affected – by 46,2% (p<0,05). The average extension power of a weaker knee increased by 72,1% (p<0,01), of a stronger – by 65,8% (p<0,01). The average flexion power of a more affected ankle joint elevated by 48,9% (p<0,05), of a less affected – by 69,4% (p<0,01). In the study group there were statistically significant differences from the control group in the most parameters (p<0,05), excluding CRP, ESR, DAS28 and the average flexion power of a more affected ankle joint (p>0,05). After 12-months in the study group there was significantly more frequently a good response to treatment according to the EULAR criteria (DAS28) (85,7% vs 63,6% in the control group, p<0,05).

Conclusions: 12-month complex rehabilitation program relieves pain, improves quality of life, functional status, motion activity and helps to control disease activity in patients with RA receiving abatacept.

REFERENCES:

- 1] Forestier R, et al. *Joint Bone Spine* 2009;76(6):691–8.
- 2] Hurkmans EJ, et al. *Acta Reumatol Port* 2011;36(2):146–58.
- 3] Vliet Vlieland TPM. *Best Pract Res Clin Rheumatol* 2009;23(1):103–16.
- 4] Vliet Vlieland TPM, van den Ende CH. *Curr Opin Rheumatol* 2011;23(3):259–64.

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FRI0685 HAND FUNCTIONS ARE AFFECTED DEPENDING ON THE CURVE PATTERN IN IDIOPATHIC SCOLIOSIS

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Background: Idiopathic scoliosis (IS) is a three-dimensional deformity and causes postural distortions in head, trunk, scapular region and upper extremities. Hand functions have not been evaluated in relation to lateral curvature of the spine in IS previously. There is a need to evaluate possible changes in hand functions with scoliotic curve in idiopathic scoliosis.

Objectives: The aim of this study was to investigate hand functions in individuals with idiopathic scoliosis.

Methods: Ninety-four individuals with mild or moderate idiopathic scoliosis (Cobb angle range: 10° – 45°) were included. Curves were classified as single thoracic (n= 18), single thoracolumbar (n= 33), single lumbar (n= 22) and double curves (n= 21). Assessments included hand dexterity with Minnesota test, hand reaction time with Nelson test, hand-eye coordination with finger-to-nose test, throwing accuracy with Functional Throwing Performance Test, and upper extremity stability with the Closed Kinetic Chain Upper Extremity Stability Test. One-way ANOVA was used to compare continuous variables between different curve pattern groups and a Tukey's hsd means comparison was used to examine the nature of the significant difference found by ANOVA. In addition, Student's t test was used to compare the parameters between the convex and concave side of the curve for each group.

Results: Hand-eye coordination and throwing accuracy was significantly worse in thoracic curve pattern group than lumbar ones for both convex and concave sides of the curve. There was no difference between curve patterns in terms of hand dexterity, hand reaction time and upper extremity stability. When compared with concave side, hand dexterity was greater in the convex side for thoracic curves ($p<.05$). For double curves, convex side had better hand dexterity and reaction time than concave side ($p<.05$). But there was no difference between convex and concave side for thoracolumbar and lumbar curve patterns ($p>.05$).

Conclusions: This study showed that hand function is affected, depending on the curve pattern in idiopathic scoliosis. There is no knowledge about how hand function is affected in patients with scoliosis in the literature. Further research following these findings may lead to an understanding of the change in hand functions and its relation with scoliosis-related characteristics, such as age, curve magnitude and trunk deformity.

REFERENCES:

1. Cook SD, Harding AF, Burke SW, Whitecloud TS, Barrack RL, Leinhardt TM. Upper extremity proprioception in idiopathic scoliosis. *Clinical orthopaedics and related research* 1986;213:118–24.
2. Beaulieu M, Toulotte C, Gatto L, Rivard CH, Teasdale N, Simoneau M, et al. Postural imbalance in non-treated adolescent idiopathic scoliosis at different periods of progression. *European Spine Journal* 2009;18:38–44.
3. Veldhuizen AG, Wever DJ, Webb PJ. The etiology of idiopathic scoliosis: biomechanical and neuromuscular factors. *European spine journal* 2000;9:178–84.

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FRI0686

THE EFFECT OF FOOT ORTHOSES ON BALANCE IN RHEUMATOID ARTHRITIS PATIENTS: A RANDOMIZED CLINICAL TRIAL

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Background: Rheumatoid patients(RA)have increased rate of falls and an impaired balance. Foot orthoses are commonly used in RA. Despite the evidence of pain relief with foot orthoses, it is not clear if their use can improve or even impair balance in RA.

Objectives: The aim of this study was to evaluate the effect of foot orthoses on balance of RA patients.

Methods: 94 RA patients in the outpatient clinic of the Rheumatology Division of Unicamp were randomly assigned to intervention group/IG(n=48)with foot orthoses or control group/CG(n=46)without orthoses. At initial visit, subjects were assessed regarding:sociodemographic and clinical data(number of falls in last year, fear of falling, disease duration, rheumatoid factor, Imedication, visual impairment, vertigo, physical activity, body mass index, comorbidity index, foot tactile sensitivity, number of lower limbs swollen and tender joints count, disease activity-CDAI and disability-HAQ). Subjects answered The Foot Function Index-FFI and were submitted to Berg Balance Scale-BBS, the Timed Up and Go-TUG and the 5-Time Sit Down-to-Stand up-SST5 tests.IG subjects received custom made insoles according to each foot needs. After four weeks, subjects were reassessed for FFI, BBS and TUG. To compare baseline values of groups, the chi-squared test, Fisher's exact test and Mann-Whitney test were applied.ANOVA for repeated measures was used to compare differences between groups and times for BBSTUG and FFI. Effect size was analyzed using the Cohen's d test. All data were analyzed with a 5%level of significance.

Results: 81 subjects completed the research protocol,40 in the IG and 41 in the CG. Groups were similar at baseline for most variables with exception of

comorbidity index(worst index in IG) and race($p<0.05$). After four weeks, FFI-total, FFI-Pain, FFI-activity limitation disclosed a significant improvement only in IG. Significant differences between times were noted for TUG and BBS only in IG. Interaction group versus time was significant for FFI and BBS. Subjects from IG reported a mean wearing time of 7.32hs/day. Adverse effects were noted in ten subjects(foot pain, hot foot).

Comparison between IG and CG at baseline (t1) and after 4 weeks (t2)

Variables	IG vs CG, p [*]	t1 vs t2, p [*]	Interaction groups vs time, p-value	Effect Size ^{**}
FFI-pain	0.0001	<0.0001	0.001 ^a	-0.60
FFI- disability	0.050	0.001	0.036 ^b	-0.28
FFI-activity limitation	0.007	0.004	0.011 ^a	-0.61
FFI-Total	0.002	<0.0001	0.001 ^a	-0.57
TUG	0.454	<0.0001	0.079 ^c	No interaction
BBS	0.358	0.0001	0.011 ^b	0.35
NCS	0.422	0.102	0.022	0.44

^{*}ANOVA for repeated measures (variables converted into ranks) ^{**} d de Cohen

Conclusions: Foot orthoses were well accepted and worn during long periods with FFI and balance tests (BBS, TUG)improvement. Prospective placebo controlled studies are recommended to assure the possibility to use insoles as adjuvant interventions to improve balance in RA.

REFERENCES:

1. Hennessy K, Woodburn J, et al. Custom foot orthoses for rheumatoid arthritis: A systematic review 2012 Mar;64(3):311–20.
2. de P Magalhães E, Davitt M, et al. The effect of foot orthoses in rheumatoid arthritis. *Rheumatology* 2006;45(4):449–53.
3. Clark H, Rome K, et al. A critical review of foot orthoses in the rheumatoid arthritic foot. *Rheumatology* 2006;45(2):139–45.
4. Metli N, Kurtaran A, et al. Impaired Balance and Fall Risk in Rheumatoid Arthritis Patients. *Annals of the Rheumatic Diseases* 2014;73:906.

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FRI0687

EFFECT OF PERINEURAL INJECTION THERAPY IN MODERATE AND SEVERE KNEE OSTEOARTHRITIS; A COMPARATIVE STUDY

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Background: Osteoarthritis (OA) is the most common rheumatologic disease. Knee OA is the most common form of symptomatic OA. It is the fourth most important global cause of disability in women and the eighth most important cause in men¹.

Studies found that subcutaneous prolotherapy is an effective treatment for several painful conditions. Some author hypothesizes that subcutaneous prolotherapy injections induce apoptosis of proliferating peptidergic nociceptors and neovessels by reducing vascular endothelial growth factor levels and restoring effective repair processes, with reduction of pain².

Objectives: To assess the effectiveness of perineural injection therapy as a new modality in management of pain, physical function, ambulation activity, disability and psychological status in moderate and severe knee osteoarthritis.

Methods: In this study; we selected 100 patients with moderate and severe knee osteoarthritis diagnosed clinically and radiologically by plain x-ray. Patients were classified into four equal groups (25 patients in each group). Group I received 6 weekly subcutaneous injections of 0.5–1 ml of buffered dextrose 5% in each chronic constriction injury points and tender points around knee. Group II received therapeutic continuous US three times weekly for 6 weeks using 1-MHz US head, set to an intensity of 1 W/cm2 for 10 min. Group III received combined perineural and US therapy. Group IV received sham US. All patients received 15 min of quadriceps isometric exercise of both knees.

Assessments were performed at baseline, at the end of the treatment and after three and sixth months. using the following measurements: Primary outcome was pain on movement assessed by visual analog scale (VAS). Secondary outcomes consisted of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores, 50 meters walking time, Lequesne index, Hospital Anxiety and Depression Scale (HADS).

Results: No baseline differences existed between all groups. The improvement in group IV was non-significant ($p>0.05$), while there was significant improvement in all other groups ($p<0.05$) in all primary and secondary outcomes after treatment, 3 and 6 months later. In comparing groups I, II, III the best improvement was in