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EFFICACY OF THE CONSUMPTION OF YOGURT SUPPLEMENTED WITH A NATURAL EXTRACT CONTAINING HYALURONIC ACID (MOBILEE™) IN ADULTS WITH MILDLY JOINT DISCOMFORT - A PROSPECTIVE RANDOMIZED DOUBLE-BLIND PLACEBO CONTROLLED TRIAL

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Purpose: The objective of the present study was to determine the efficacy of the oral administration of yogurts supplemented with an extract rich in hyaluronic acid in healthy individuals with mildly joint discomfort.

Methods: A prospective doubled-blind randomized placebo-controlled trial with 40 healthy individuals with joint discomfort (VAS <4) was designed. The effect of oral supplementation with a natural extract rich in hyaluronic acid (Mobilee™) included in a yogurt matrix was evaluated on functional and quality of life parameters. The isokinetic Biodex system 3 for measuring maximal muscle strength, total work and power mean was used. Participants were divided into two groups (n=20) who consumed daily a yogurt supplemented with the extract or not supplemented during a period of 90 days.

Results: The increase of the maximum peak torque of the knee extensors respect basal value was 7.6 ± 7.6 Nm for the supplemented and 2.5 ± 4.7 Nm for the control group at $180^\circ/\text{s}$ ($P=0.0582$) and 6.5 ± 5.8 Nm for the supplemented and -1.0 ± 7.1 Nm for the control group at $240^\circ/\text{s}$ ($P<0.05$). The same pattern of response was observed for total work with increases of 39.8 ± 14.0 J for the supplemented and 2.1 ± 11.9 J for the control group at $240^\circ/\text{s}$ ($P=0.0588$) and for the power mean with increases of 16.6 ± 6.1 W for the supplemented and -1.3 ± 5.2 W for the control group at $240^\circ/\text{s}$ ($P<0.05$). Differences were less pronounced for the knee flexors. No differences were detected for Lequesne score and SF-36 except for social functioning subscale at one month follow-up.

Conclusions: This controlled prospective nutritional trial confirmed that 3 months oral consumption of a natural extract containing hyaluronic acid (Mobilee™) in healthy individuals with joint discomfort of the knee provide improvements in muscular strength.

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NUTRITION AND KNEE OSTEOARTHRITIS IN POSTMENOPAUSAL WOMEN

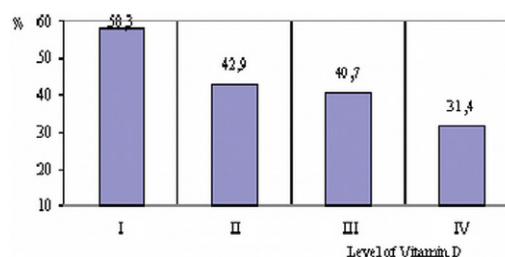
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Purpose: The purpose of this study was to determine the relationship of consumption of different nutrients in feeding ration of ukrainian postmenopausal women and incident and stage of knee osteoarthritis.

Methods: Influence of diets on development and progressing of knee osteoarthritis was investigated in 133 postmenopausal women. A diagnosis of knee osteoarthritis was performed by the criteria of American Rheumatology Association (1995), its stage - by Kellgren&Lawrence classification. Consumption of different macro- and micronutrients in daily feeding ration was analysed with questionnaire (during three days).

Results: There are a literature data about possible influence of some nutrients on the development and progressing of knee osteoarthritis. It was shown, that the patients with low level of vitamin C in their blood had a triple progressing risk of osteoarthritis. Famous properties of vitamins E and A also give a possibility to think about their role in progressing of osteoarthritis. The patients

with low concentration of vitamin D in feeding ration have a raised risk of knee osteoarthritis. We did not found the differences in contents of most macro- and micronutrients in depend of incident and stage of osteoarthritis, however it was a tendency in consumption of some microelements and vitamins. The patients with OA compared with control group have a more level of β -carotin ($F=2.64$, $P=0.11$), folacin ($F=2.94$, $P=0.09$), less level of vitamin D (accordingly 0.33 ± 0.04 and 0.53 ± 0.06 ; $F=6.51$, $P=0.01$). We have not founded the differences in consumption of vitamin C ($F=1.96$, $P=0.16$), vitamin A ($F=0.05$, $P=0.83$) and E ($F=0.85$, $P=0.36$) in patients dependency on presence of arthritis. The quartiles analysis showed that frequency of knee osteoarthritis in women in first quartile of vitamin D consumption was 58,3 %, fourth quartile - 31,4 %. We did not find the reduction the frequency of knee osteoarthritis in postmenopausal women with different level of vitamin C (I quartile - 50, II - 39, III - 37,5, IV - 47,6%) and E (I quartile - 50, II - 40,8, III - 36,7, IV- 64,7% accordingly). We detected some reduction the frequency of knee osteoarthritis in patient with high level of vitamin A (I quartile - 46,2, II - 50, III - 42,9, IV- 28,5%) and B₆ (I quartile - 71,4, II - 36,7, III -48,1, IV- 41,7% accordingly). We have not founded the differences in consumption of all macro- and micronutrients in depend of stage of osteoarthritis.



Conclusions: Our results shows that in the feeding ration of ukrainian postmenopausal women with knee osteoarthritis there are significant more level of vitamin D and diminished level of some microelements and vitamins, that can contribute to its progressing.

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ANTI-INFLAMMATORY EFFECTS OF ORALLY INGESTED COLLAGEN HYDROLYSATE OR GLYCINE

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Purpose: Collagen hydrolysate (CH) has been indicated to improve joint comfort and function. It is suggested that the specific amino acids derived from the collagen could reduce pain and help to protect the joint in osteoarthritis (OA) patients. Glycine comprises about one third of the amino acids in the collagen. It has been shown that the free glycine levels in the blood increase after ingestion of CH. Furthermore, preclinical studies indicate an anti-inflammatory effectiveness of glycine. The present study evaluates the anti-inflammatory capacity of CH and glycine.

Methods: Different amounts of CH (12.5, 25 and 50 mg/mouse) and glycine (10, 20 and 50 mg/mouse) were administered orally to Balb/C mice, aged 14 weeks. Inflammation was induced, 3 h after administration of the test components, by injecting zymosan (25 μl , 0.5% in PBS) intradermally in the ear. Ear-swelling, as a measure for inflammatory response, was detected using an engineer's micrometer. Serum levels of glycine and LPS stimulated production of IL-6 and TNF- α in whole blood or PBMC were detected at 3 h after intake of the test components.

Results: Both CH and glycine were able to counteract the zymosan-induced ear swelling at 3 h after zymosan injection in a concentration depending manner. This effect was accompanied by a concentration dependent increase in the levels of free serum glycine and a decrease in the production of pro-inflammatory cytokines. The CH effects were less pronounced compared to the glycine effects.

Conclusions: The present study indicates that CH is able to display an anti-inflammatory activity. The reduction of pain by CH, as indicated in several clinical studies in patients with OA, could at least partially origin from the anti-inflammatory capacity of CH.

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A NOVEL BIOMECHANICAL DEVICE IMPROVES GAIT PATTERNS AND CLINICAL MEASUREMENTS IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Purpose: The management of knee Osteoarthritis (KOA) is presently focused on reducing the level of pain and disability. Muscle weakness and proprioception difficulties have been related to KOA severity, level of pain and disability and are an integral focus of the therapeutic program for KOA patients. A novel biomechanical device (APOS system) designated to strengthen and train neuromuscular control was shown to reduce knee adduction moment. The purpose of the current study was to investigate the clinical effect of this biomechanical device on patients with KOA.

Methods: 47 patients with bilateral KOA were enrolled to the study. Patient underwent a gait test and completed the WOMAC Index and the SF-36 health survey at baseline and after 12 weeks. The biomechanical device was individually calibrated to each patient as to allow training under reduced pain. Patients were instructed to walk with the device on a daily basis for a period of 12 weeks. Spatio-temporal parameters were used to identify changes in gait patterns and the questionnaires were used to identify changes in the reported level of pain, function and quality of life.

Results: Gait velocity, step length and single limb support increased significantly following the 3 months of treatment (10%, 6%

and 1%, respectively). In addition, WOMAC-Pain and WOMAC-Function significantly decreased (22% and 24%, respectively), and SF-36 score significantly increased (14%) ($P < 0.001$ for all parameters).

Conclusions: Our results suggest an overall improvement in the gait pattern, level of pain and functional condition of patients with KOA following 12 weeks of treatment with the novel biomechanical device.

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COMPARISON OF THE EFFICACY OF TWO PRODUCTS SOLD AS ORALLY-ADMINISTERED HYLAURONIC ACID SUPPLEMENTS, IB0004 AND ID386 ON THE ENDOGENOUS IN VITRO SYNTHESIS OF HYALURONIC ACID BY HUMAN SYNOVIOCYTES

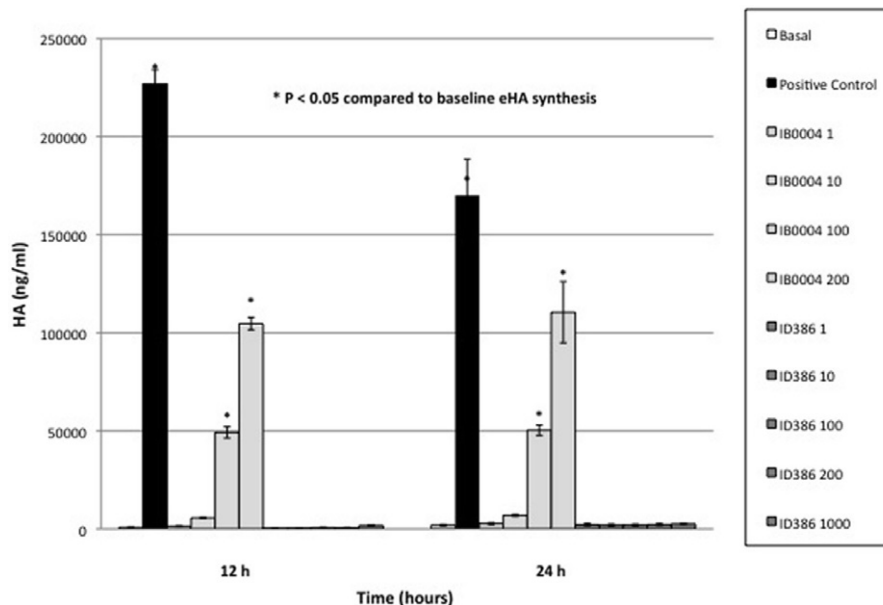
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Purpose: Hyaluronic acid (HA) is a heteropolysaccharide present in synovial fluid and in extracellular matrix of cartilage. HA is synthesized by human synoviocytes and chondrocytes, and is responsible for the viscosity of articular synovial fluid. Synovial fluid has mechanical properties and biochemical properties such as: 1) Inhibition of prostaglandin E2 and synthesis of nitric oxide (NO) induced by IL-1. 2) Protection against proteoglycan depletion. 3) Protection against cytotoxicity induced by oxygen-derived free radicals and NO-induced apoptosis. 4) Affects on leukocyte function. 5) The suppression of cartilage-matrix degradation. 6) Stimulation of the synthesis of endogenous HA. In patients with OA, the concentration of endogenous HA in synovial fluid decreases significantly. Intra-articular administration of exogenous HA is a therapeutic option currently in use to treat grades II-III knee OA patients. We therefore conceived the present study, to find out whether the compounds IB0004 (a natural rooster comb extract rich in HA) and ID386 (avian hydrolyzed collagen with low HA content) stimulate the synthesis of endogenous hyaluronic acid in human osteoarthritic synoviocytes.

Methods: To study the effect of IB0004 and ID386, Human synoviocytes from OA synovial tissue were prepared by enzymatic digestion, isolated, and cultivated in RPMI supplemented with 10%



Abstract 518 – Figure 1. Production of endogenous hyaluronic synthesis from human synoviocytes with varying intervention concentrations at two time periods.