The Role of Nutrition in The Treatment of Chronic Musculoskeletal Diseases

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1 Editorial

Chronic musculoskeletal diseases demonstrate a high prevalence, especially amongst the older population [1]. Diet therapy might have several purposes in the treatment of chronic musculoskeletal diseases. It may play a role in the suppression of chronic inflammation and pain. Nutrition might be an aid in improving bone, cartilage structure and function, and in immune modulation as well [2].

Foods, herbs, spices, marine species, and biologically-active compounds may have impacts on musculoskeletal health [3]. Vegetarian, Mediterranean diet, and fasting may help in the improvement of chronic musculoskeletal disease conditions [4,5].

Amongst elderly populations, the proper consumption of those nutriceuticals that play a role in musculoskeletal health and cognitive function is essential. Sixteen different micronutrients can be characterized as having evidence-based scientifically beneficial effects on musculoskeletal health and cognitive function in the elderly, such as beta-alanine, calcium, creatine, fluorides, leucine, magnesium, omega-3 fatty acids, potassium, vitamin B6, vitamin B9, vitamin B12, vitamin C, vitamin D, vitamin E, vitamin K2, and zinc [3].

Rheumatoid arthritis and osteoarthritis have a different nutritional approach, due to the variety of disease causalities [4,6,7]. Whereas diet therapy of degenerative joint diseases is based on targeting and maintaining normal Body Mass Index, in rheumatoid arthritis nutritional intervention focuses on reducing symptoms and preventing disease progression. Vegetables, fruits, polyunsaturated fatty acids (n-3, n-6, n-9), vegetarian, Mediterranean diet, and food-supplementation might be essential [8].

In the 19th century, Jonathan Hutchinson was amongst those doctors who advised lifestyle interventions and marine fish oil as a supplemental therapy for systemic lupus erythematosus (SLE) [9]. Nowadays, it has been scientifically proven that moderate energy intake, antioxidant rich diet, and the consumption of fish oil may help in the reduction of inflammation and the treatment of comorbidities that occur in SLE [10]. Regarding the delay of degenerative joint diseases, it is essential to target normal BMI (20-25kg/m²), although there are some cases where physical activity might be more important than body weight loss itself [11]. Alternate-day fasting (one day 25% of energy requirement, the following day 75-90% of total energy requirement, consumed) might be effective in weight reduction [12].

Instead of making drastic changes in diet, it is more effective to increase the consumption of fruits, vegetables, grains, and fish and reduce the consumption of meat, refined sugar, white flour, salt and saturated fatty acid [13,14]. In the delay or elimination of chronic inflammation, elimination diet, vegetarianism, and fasting might be effective [4,5,15].

Food supplementation with omega-3 fatty acids, glucosamine, and chondroitine sulphate may play a central role in the delay of osteoarthritis [16]. Evening primrose oil, borage oil, omega-3 fatty acid, gamma-linolenic acid, ginger, curcumin, bromelain (found in pineapple), and polyphenol compounds such as quercetine may improve musculoskeletal disease conditions [17,18].

There are vitamins, minerals and trace elements that have an impact on the improvement of musculoskeletal conditions:

- Calcium (bone and teeth structure, bone mineralization, muscle contraction) [19,20]
- Magnesium (bone structure, controlling muscle contraction) [21]
- Vitamin-K2 (cofactor of structural and regulation proteins in bone tissue) [20, 22, 23]
- Zinc (stimulation of osteoblast activity and promotion of bone mineralization) [24]
- Vitamin-D (bone formation, maintaining bone mineralization, limiting factor of calcium absorption) [19, 25]
- Copper (collagen and elastine formation, wound healing, immune competence) [17]
- Vitamin-A (bone formation, immune competence) [20]
- Selenium (immune modulation) [26]
- Phosphorus (bone mineralization) [27,28]
- Folic acid (protein synthesis, development of musculoskeletal system) [29]
- Vitamin B1- (collagen synthesis), Vitamin B2- (prevention of fractures) [19], Vitamin B3- (cell division, treatment of os-


Role of Nutrition in the Prevention of Musculoskeletal Disease. Nutrition interacts with musculoskeletal disease. The role of nutrition in the development of musculoskeletal disease in growing dogs has been recognized for decades. Developmental orthopedic disease refers to a group of skeletal abnormalities (e.g., osteochondritis dissecans, hip dysplasia, wobbler's syndrome, ligamentous laxity, and hypertrophic osteodystrophy) that affect primarily rapidly growing, large- and giant-breed dogs. Less, had better body condition scores, and had longer delay to treatment of chronic disease including osteoarthritis. In addition the restricted fed group had a lower incidence of osteoarthritis in most major joints, and if it occurred, it was less severe. The Role of Exercise in Treating Diabetes Mellitus. For years, the traditional cornerstones of therapy for patients with DM have been dietary modification and medication. Exercise also has been encouraged in patients with DM because regular physical activity may help to control hyperglycemia through improved glucose utilization. These changes include the development of new muscle capillaries and increases in the quantity of mitochondrial enzymes. Studies have also demonstrated that regular endurance exercise training increases the concentration of GLUT4 mRNA and protein in skeletal muscle. GLUT4 is a protein that serves as a glucose transporter.