underwent intraarticular injection with hyaluronic acid under ultrasound guidance and after 6 d continued with rehabilitative treatment aimed at combating the patient's analgesic posture, recovery of muscle traction participating in genu joint movement, decompression maneuvers and decoupation in monopodal load. Patients were evaluated at the beginning and after 3-6-9 months of therapy, through: ËOMAC test, VAS degree of pain.

Results: In the evaluation of patients at the beginning, after 3, 6, 9 months, a reduction in > 60% of VAS pain was found and the ËOMAC test in 40% of patients after the first intraarticular injection. No significant side effects were observed during infiltrative procedures.

Conclusion: This study confirms the effectiveness of the combined treatment of the rehabilitation program and intraarticular therapy under the guidance of Echos, in patients suffering from knee osteoarthritis, significantly reducing pain and recovery of functional capacity.

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GENETIC STUDY OF SUSCEPTIBILITY TO ATYPICAL FEMORAL FRACTURES RELATED TO BISPHOSPHONATE TREATMENT

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Atypical femoral fractures (AFF) are low-trauma fractures with increased risk under long-term bisphosphonate (BP) treatment. The etiology of AFF is still unclear even though a genetic basis is suggested.

A whole exome sequencing (WES) analysis of 12 patients receiving BPs for at least 5 y who sustained AFF and 4 controls also long-term treated with BPs but without any fracture was performed. In these patients, BPs were prescribed due to postmenopausal osteoporosis.

After filtration and prioritization of rare variants predicted to be damaging and present in genes shared among at least two patients, a total of 272 variants in 132 genes were identified. We then selected those genes involved in bone metabolism and/or AFF. Twelve genes were identified, highlighting *DAAM2* (mutated in four patients) and *LRP5* (mutated in other three patients), both involved in the Wnt pathway, as the most representative. Interestingly, three of the patients with *DAAM2* rare variants had received glucocorticoid treatment. The fourth patient, who had not been treated with corticosteroids, was homozygous for a predicted damaging variant. Afterwards, we intersected all mutated genes with a list of 34 genes obtained from a previous study of three sisters with BP-related AFF. Nine genes were obtained, one of them (*MEX3D*) harboring damaging variants in two AFF patients from the present study plus one variant shared among the three sisters. Of note, this gene was found underexpressed in BP-treated osteoclasts according to the GSE63009 database. Gene interaction analysis using the AFFNET web suggested a complex network among bone-related genes as well as with other mutated genes. BinGO biological function analysis highlighted cytoskeleton and cilium organization.

In conclusion, the AFF may present a multigenic background, specific to each patient, in which an accumulation of susceptibility variants may lead to a predisposition to BP-related AFF. Hence, a genetic network along with BP treatment and in some cases with glucocorticoids may trigger this so feared complication.

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DOES PARTICIPATION IN ELITE SPORTING ACTIVITY IN YOUNG ADULTHOOD HAVE LASTING BENEFITS FOR BONE HEALTH? A SYSTEMATIC REVIEW

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Objective: Recreational physical activity has commonly been associated with better bone health in later life; weight bearing sporting activity at the time of peak bone mass (PBM) acquisition may be particularly beneficial, as higher PBM is a key determinant of later osteoporosis risk. While it might be assumed that elite sporting activity may produce greater benefits, risk of injury and the female athlete trial mean that this is unproven. The aim of this study was to evaluate the evidence that elite sporting activity in young adulthood has lasting benefits for bone health, through a systematic review of available literature.

Methods: We considered retired athletes aged > 50 y who participated in elite sport in young adulthood (aged 15-30 y). Elite sport was defined as national level or above. After protocol development, the search strategy was applied to PubMed, Medline, Embase and Web of Science. References were managed using Rayyan software and bias assessed using the Newcastle-Ottawa scale. One reviewer identified papers; a second screened those considered for inclusion. The protocol was registered with PROSPERO (CRD42021293644).

Results: 1366 papers were screened, 1349 were removed, 717 had title and abstract full-screening, and 17 were retrieved. Five papers were included in the final sample. Sample size varied from 32 to 668; 3 reported findings in men, 2 in women. None included both sexes. Sports considered were football, weightlifting, endurance running and running, tennis and swimming. Ex-athletes showed varying activity levels at time of DXA measurement. BMD was measured at femoral neck, trochanter, and lumbar spine. All studies noted higher BMD measurements in former elite athletes relative to controls, though relevant lifestyle confounder information available and considered was variable. Meta-analysis was not possible as studies were too heterogenous.

Conclusion: Our study suggests that elite sporting activity in young adulthood has lasting benefits to bone health, though level of physical activity and other lifestyle factors post-retirement from elite sport may be important confounders. The few studies available have highlighted the need for future research in this area.

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EVALUATION OF RELUGOLIX COMBINATION THERAPY (REL-CT) AND BONE MINERAL DENSITY (BMD) IN WOMEN WITH ENDOMETRIOSIS-ASSOCIATED PAIN THROUGH 52 WEEKS: SPIRIT LONG-TERM EXTENSION (LTE) STUDY

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Objective: To assess the effect of Rel-CT (relugolix 40 mg, estradiol [E2] 1 mg, norethisterone acetate [NETA] 0.5 mg) on BMD for up to 52 weeks (wks).