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Longitudinal evaluation of bone mass in adolescents and young adults with juvenile idiopathic arthritis: the role of bone mass determinants in a large cohort of patients

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Background

There are very few data evaluating prospectively the bone mass and quality determinants using dual energy X-ray absorptiometry (DXA), peripheral quantitative computed tomography (pQCT), and ultrasound (US) in JIA.

Aim

To evaluate bone mass and quality determinants, and to identify the main predictors of reduced Bone Mineral Density (BMD) and bone quality using these techniques in JIA.

Methods

One hundred and fifty-one patients (median 15.6, range 9.7 to 35.2 years; 101 oligoarticular, 30 polyarticular, 15 systemic, and 15 enthesitis-related–arthritis onset [ERA]) were evaluated. Of these, fifty-nine consecutive patients were followed-up with a second evaluation. The data obtained were compared with 80 ages- and sex-matched healthy subjects.

Results

At the first evaluation, JIA patients showed a reduced spine aBMD SDS value in comparison to controls ($p < 0.005$). JIA patients showed also significant musculoskeletal deficits, with lower levels of TrabBMD ($p < 0.0001$), muscle CSA ($p < 0.005$), SSIp ($p < 0.05$), and significantly increased levels of fat CSA than controls ($p < 0.0001$). Finally, JIA patients presented a significantly reduced AD-SoS ($p < 0.001$), and QUS z-score ($p < 0.005$). These data were confirmed also in longitudinal evaluation. However, evaluating different treatments, we showed a significant negative correlation among aBMD value ($p < 0.005$), TrabBMD ($p < 0.005$), AD-SoS ($p < 0.005$), and systemic corticosteroids exposure or intra-articular corticosteroids injections, and a positive correlation among TNF-alpha-blocking agents and aBMD ($p < 0.005$), TrabBMD ($p < 0.005$), and AD-SoS ($p < 0.005$).

Conclusions

Pts with JIA have a low bone mass and quality in comparison to controls, and do not reach the normal condition over time despite the current more effective drugs.

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