PHALANGEAL QUS IN MONITORING NERIDRONATE TREATMENT IN CHILDREN AND ADOLESCENTS WITH OSTEOGENESIS IMPERFECTA: A LONGITUDINAL STUDY

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In this study we have evaluated by phalangeal Quantitative Ultrasound (QUS) the effect of Neridronate treatment in children and adolescents with osteogenesis imperfecta (OI).
Thirty-one subjects (16M, 15F) with mean age 11.8±3.5 yrs (range 6-19), with OI (type I N=19, type III N=3, type IV N=9) have been involved in the longitudinal study and measured by QUS at the phalanges at start-up of treatment; some of them (N=17) have been measured after 1 year; some have been measured after 2 years (N=13); for a subgroup (N=19) a further measurement have been collected with a mean follow-up time of 3.8±0.7 yrs. A group of 8 subjects (6M, 2F) with OI (type I N=6, type III N=2) who didn't follow any treatment, have been measured at start-up of the study and after 1 year. Neridronate treatment consisted in 2 mg/kg infused IV in 30 minutes every 3 months. QUS measurements were done with the DBM Sonic BP (IGEA, Carpi MO, Italy); AD-SoS (Amplitude dependent Speed of Sound) and BTT (Bone Transmission Time) were considered in the analyses.
Treated and non treated groups did not differ for age at baseline (11.8±3.5 vs 11.5±5.3 years respectively, p=0.86).
At 1 year follow-up a significant increase in BTT (+0.13±0.22, p<0.05) and a non significant increase in AD-SoS (+12±108, p=n.s.) was observed in the treated group. In the control group BTT remains stable (+0.01±0.12, p=n.s.) and AD-SoS decreases non significantly (-30±79, p=n.s.).
In the subsequent years BTT increases significantly in the treated group (+0.10±0.14, p<0.05 at 2 years follow-up; +0.29±0.25, p<0.0005 at third f.u.); AD-SoS increases also, but significantly only at third follow-up (+110±88, p<0.0001).
In conclusion BTT is able to reveal the effect of Neridronate treatment in children and adolescent affected by OI, discriminating among subjects on treatment and subjects not on treatment after 1 year. The positive effect of treatment on BTT is observed also at 2 years follow-up and even in the subsequent years.