

PHALANGEAL QUS AND DXA IN CHILDREN AND ADOLESCENTS WITH OSTEOGENESIS IMPERFECTA

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In this study we analysed the relationship among phalangeal quantitative ultrasound (QUS), dual energy X-ray absorptiometry (DXA) at lumbar spine, femur, distal radius, total body, and auxologic parameters in a population of children and adolescents with osteogenesis imperfecta (OI).

Forty subjects (24 M, 16 F) have been involved in the study and measured by DXA and QUS; information regarding age, height, weight and BMI were also collected.

QUS measurements were made 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. DXA measurements were done with Hologic 4500 instrument (Waltham, MA, USA); BMD (Bone Mineral Density) and BMC (Bone Mineral Content) data were collected.

Mean age of the subjects was 12.7 ± 3.5 yrs (range 5-19), mean height was 134 ± 24 cm (range 84-176), mean weight was 36.9 ± 15.2 kg (range 11-70) and mean BMI was 20.0 ± 5.2 kg/m² (range 13-43); they were affected by type I (N=27), type III (N=5) and type IV (N=8) OI.

All correlations were statistically significant ($p < 0.05$). The DXA correlation coefficients with auxological data were higher with BMC than with BMD at all sites.

The most related DXA sites to auxological parameters were medio-distal radius and total femur. For what concern QUS the most correlated parameter to auxological variables was BTT. DXA parameters were correlated to a higher extent to height and weight ($0.70 < r < 0.90$) rather than to age ($0.38 < r < 0.74$), whilst QUS parameters were most strictly related to age ($0.66 < r < 0.81$) rather than to height or weight ($0.42 < r < 0.65$).

Correlations among DXA and QUS parameters have evidenced that QUS parameters are more strictly related to BMC rather than to BMD at all sites; higher values of correlation coefficient were observed for BTT vs medio-distal radius BMC ($r=0.78$) and vs total femur ($r=0.75$). Partial correlations of AD-SoS and BTT versus age are still significant even if adjusted for medio-distal radius and femur BMC, whilst correlation versus height and weight are not significant when adjusted for DXA.

In conclusion QUS and DXA are differently correlated with auxological parameters suggesting that these measurements are influenced in a different manner by growth factors in subjects with OI.