Correlation of Strength Strain Index (SSI) and Torque in Upper Limbs

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- A widely spread and common method to assess the current status of the bone quality is to correlate age with bone mineral density. A serious problem of this method is that it gives no evidence about bone strength.

- The aim of this study was to find a technique that is able to predict bone strength.

- In a cross-sectional study of 342 healthy subjects of both sexes (19-82 years) the polar Strength Strain Index (SSI) was determined by pQCT-messurements, using the STRATEC XCT 2000. The measuring place was set on the right radius at 4% of the complete ulna length. Maximal muscle-force was measured isometrically at an angle of 90° at the right upper limb. The SCHNELL multi muscle machine M3 divided the individual outcomes with the length of the antebrachium to get the torque.

- Our results show a high correlation between the maximal muscle torque and the SSI (r=0.82, p<0.01) and therefore corroborate the hypothesis that muscle force is a leading variable that influences bone strength.

- Furthermore these outcomes might be worthwhile for predicting bone diseases.