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2.25 The Relation Between Back Shape And Torsion In Lower Limb Bones Measured By Ultrasound In Adolescent Idiopathic Scoliosis

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This paper examines the relation between back shape in the transverse plane (back hump) and torsion in lower limbs as measured by ultrasound in two groups of patients attending the Scoliosis Clinic: (1) girls having surgery for adolescent idiopathic scoliosis (n=67, thoracic 42, thoracolumbar 22, lumbar 3, right 51, left 16; and (2) school screening referrals including boys and girls (n=95, boys 20, girls 75). Back shape was measured as angle of trunk inclinations (ATIs) at each of 10 levels by five methods namely, Scoliometer in each of three positions (standing forward bending, sitting forward bending and prone), and a commercial television-computer scanning device (ISIS) in each of two positions (standing erect and sitting erect). Femoral anteversion (FAV) and tibial torsion (TT) were measured using real-time ultrasound. The relation between the back shape variables and the torsion in the lower limb bones was examined by univariate and multivariate (canonical) correlations using Hotelling's T for multivariate analysis. The findings show that *in the operative girls, left FAV* (but not right FAV or either TT) is significantly associated with ATIs at levels 1-10, 2-5 and 5-8 in the trunk for each of three positions using the Scoliometer and in ISIS standing. *In the screening boys (but not the girls) left TT* (but not right TT or either FAV) is significantly associated with ATIs in each of the Scoliometer prone and ISIS standing positions. We suggest that the findings reflect neuromuscular factors common to spine and trunk and each of a) left femur in the girls and b) left tibia in the boys. The laterality of these associations with the left lower limb is unexplained but may indicate control by the right cerebral cortex.

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