ΣΚΟΛΙΩΣΗ: ΟΙ ΑΛΛΑΓΕΣ ΣΤΗΝ ΑΝΑΠΤΥΞΗ ΤΗΣ ΣΠΟΝΔΥΛΙΚΗΣ ΣΤΗΛΗΣ ΕΙΝΑΙ ΕΓΓΕΝΕΙΣ Η ΔΕΥΤΕΡΟΓΕΝΕΙΣ;

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MORPHOLOGY, DEVELOPMENT & DEFORMATION OF THE SPINE IN MILD AND MODERATE SCOLIOSIS: ARE THE CHANGES IN THE DEVELOPMENT OF THE SPINE PRIMARY/INHERENT OR SECONDARY?

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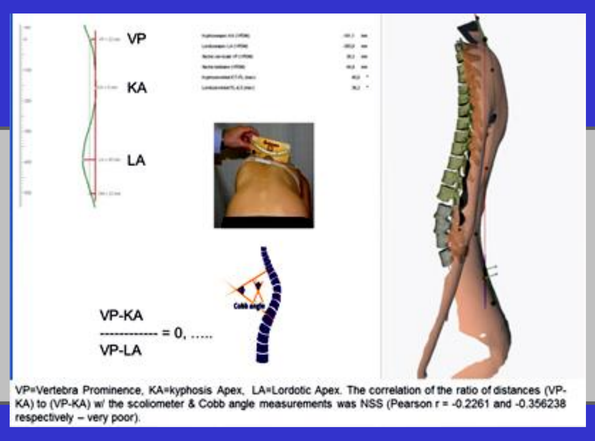

VP=Vertebra Prominence, KA=kyphosis Apex, LA=Lordotic Apex. The correlation of the ratio of distances (VP-KA) to (VP-KA) w/ the scoliometer & Cobb angle measurements was NSS (Pearson r = -0.2261 and -0.356238 respectively – very poor).

Introduction and aim of the study: The question always arises as to whether the changes in the spine in scoliogenesis of idiopathic scoliosis (IS), are primary/inherent or secondary. There is limited information on this issue in the literature. The aim is to address the above question, studying the sagittal profile of the spine in IS using surface topography.

Material and methods. After approval of the ethic committee of the hospital 45 children, 4 boys and 41 girls, with an average age of 12.5 years (range 7.5 - 16.4 years), referred to the scoliosis clinic by our school screening program, were studied. The height and weight of children were measured. The Prujis scoliometer used in standing Adam test in thoracic (T), thoraco-lumbar (TL) & lumbar (L) region. All IS children had a ATR greater than or equal to 5 degrees. The Cobb angle was assessed in the postero-anterior radiographs. The posterior truncal surface topogram, using the "Formetric 4" apparatus, was also done and the distance from the vertebra prominence (VP) to the apex of the kyphosis (KA), and similarly to the apex of the lumbar lordosis (LA) was calculated, figure. The ratio of the distances (VP-KA) for (PV-LA) was calculated. The averages of the parameters were studied, and the correlation of the ratio of distances (VP-KA) to (VP-KA) with the scoliometer and Cobb angle measurements was assessed respectively (Pearson corr. Coeff. r).

Results. The average height was 1.58 meters (range 1.37-1.80), weight 48.57 kilograms (range 32-65). The IS children had right (Rt) T or TL curves. The mean T Cobb angle was 24 degrees and 26 in L. The (VP-KA) distance was 128.21mm (range 95-177) and the (VP-KA) distance was 327.71mm (range 278 - 417). The correlation of the ratio of distances (VP-KA) to (VP-KA) with the scoliometer and Cobb angle measurements was non-statistically significant (Pearson r = -0.2261 and -0.356238 respectively).

Discussion conclusions. The lateral profile of the spine was considered to be a primary aetiological factor of IS due to the fact that the kyphotic thoracic apex in IS is located in a higher thoracic vertebra (more vertebrae are posteriorly inclined), thus creating conditions of greater rotational instability and therefore greater vulnerability for IS development. Our findings do not confirm this hypothesis, since the correlation of the (VP-KA) to (VP-KA) ratio with the truncal asymmetry, assessed with the scoliometer and Cobb angle measurements, is non-statistically significant. It is clear that hypokyphosis is not a primary causal factor for the commencing, mild or moderate scoliotic curve, as published elsewhere. We consider that the small thoracic hypokyphosis on the developing scoliosis adds to the view that the reduced kyphosis, facilitating the axial rotation, could be considered as a permissive factor rather than a causal one, in the pathogenesis of IS. This view is consistent with previously published views (see RG Burwell 1992) and it is obviously the result of gravity, growth and muscle tone, Schlosser et al 2013, Smit 2020.

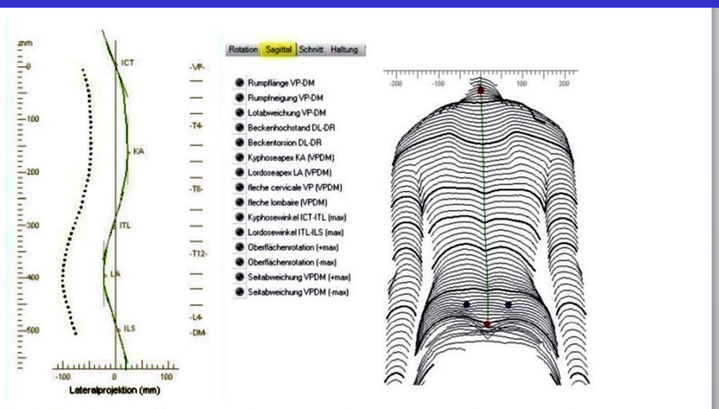

Figure: VP= Vertebra prominence, this corresponds to ICT (zero 0 mm), KA = Kyphotic Apex, LA = Lordotic apex. If the (VP-KA) distance is shorter, that is, if the IS thoracic vertebra corresponding to KA is higher at the thoracic spine, then the value of the distances' ratio (VP-KA)/(VP-LA) turns smaller, because the nominator of the fraction is smaller, (shorter VP-KA) distance. If this ratio were statistically significantly correlated with the Cobb angle and the truncal asymmetry, this would imply that this morphology (higher KA in IS) would be a primary aetiological factor for the

Literature

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