

Oral presentation

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Sitting forward bending position versus standing position for studying the back shape in scoliotic children

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Objective

Potential benefits of sitting position for scoliosis exam include stable posture and level pelvis. The hypothesis was that surface topography as well as scoliometer evaluation can be performed in sitting forward bending position and that the parameters describing deformity in the frontal and axial plane can be provided.

Study design

Cross sectional study of 113 girls with idiopathic scoliosis, aged 14.0 ± 2.1 years (range 10 to 18), mean height 160.0 ± 9.4 cm (range 121 to 184), mean weight 48.6 ± 9.2 kg (range 22 to 75) who underwent raster stereography exam of the back in standing position and in sitting forward bending position. The Cobb angle of the main curve was 41.2 ± 16.7 degrees (range 10 to 95), Risser sign value from 0 to 5, median = 2.

Methods

Spine length (C7-S1), Hump Sum and posterior trunk symmetry index (POTSI) were measured [1]. Bunnell scoliometer [2] was used to measure angle of trunk rotation (ATR) in standing position at three levels of the spine and the Sum of Rotation was compared with the Hump Sum. Additionally 49 girls, having scoliosis of 10 to 70 degrees of Cobb angle, were examined for ATR both in standing

forward bending (Adams' test) and in sitting forward bending position.

Results

Spine length was 41.5 ± 3.5 cm (29.8–49.9 cm) in standing and 46.5 ± 3.5 cm (35.0–53.4 cm) in sitting forward bending position (mean difference 5.0 ± 2.7 cm, $p < 0.05$, Mann Whitney U test) proving that flexion of the trunk was achieved. The Hump Sum value was 21.3 ± 7.7 degrees in sitting and 19.0 ± 6.6 degrees in standing position ($p < 0.01$). The correlation coefficient for Hump Sum vs Sum of Rotation was 0.71 for the sitting and 0.49 for the standing position ($p < 0.05$). POTSI was 23.3 ± 13.8 in sitting and 28.9 ± 17.5 in standing position ($p < 0.001$). The ATR was not distinct between standing and sitting forward bending position ($p > 0.05$).

Conclusion

Back asymmetries in children can be measured successfully in sitting forward bending position. This position provides a more stable posture and eliminates the impact of lower limb discrepancy, and therefore may be considered a recommended position for scoliosis exam using scoliometer or surface topography.

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