

Oral presentation

Static pelvic obliquity can influence clinical assessment of trunk rotation in idiopathic scoliosis

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Background

The Bunnell scoliometer is widely used for scoliosis screening; however the cut-off value for the angle of trunk rotation is still debated. It is not clear whether and how much the scoliometer measurements are sensitive to a non-level pelvis.

Study goals

The aim of this study was to verify whether the angle of trunk rotation is related to the functional pelvic obliquity. To answer this question, we measured the angle of trunk rotation (ATR) in the classical forward bending position while the unlevel pelvis was adjusted with a shoe lift.

Materials and methods

The ATR was measured in 25 girls with idiopathic scoliosis (study group), age 13 to 19 years (mean 15.6 ± 1.8 years) and in 25 healthy girls (control group), age 12 to 16 years (mean 14.2 ± 0.9 years). In the study group the Cobb angle revealed curves ranging from 35.0° to 92.0° (mean $54.4^\circ \pm 18.0^\circ$) in the lumbar spine and 38.0° to 93.0° (mean $60.7^\circ \pm 17.3^\circ$) in the thoracic spine. The Bunnell scoliometer was then used in two positions: sitting and standing, both forward bending positions. The scoliometer readings were noted at four levels of the spine: high thoracic, main thoracic, lumbar and sacral. Then, the measurements were repeated in the same subjects and at the same four levels of the spine, but after leveling the left or the right side of the pelvis using a 1-2 cm thick shoe lift.

Results

When compared to the classical forward bending position, the ATRs were significantly different after the shoe lifts were applied. Typical patterns of alternatively raised or lowered ATRs within adjacent spinal levels were also identified. The difference depended on the shoe lift height and on the spinal level: the change was 1.5° - 4.5° of rotation within the lumbar spine; 1.2° - 3.8° of rotation within the thoracolumbar spine, and 0.7° to 2.4° of rotation within the high thoracic spine.

Conclusion

The measurement of the ATR with the Bunnell scoliometer is affected by a non-level pelvis, especially within the lumbar spine. This should be taken into consideration when using the scoliometer in school screening.