Scoliosis

Oral presentation

How objective is the measurement of spinal deformity using surface topography?

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Background

Claims have been made that surface topography is an objective measurement; however, there is a propensity for errors due to significant postural influences. The purpose of this study was to help estimate these influences by measuring patients with scoliosis in three standardized postural positions.

Materials and methods

We studied the surface topography measurement in 100 in-patients with idiopathic scoliosis divided into different age-groups. First group: 7 to 12 years (n = 12), second group: 13 to 16 years (n = 51), the third 17 to 20 years (n = 15) and the fourth >21 years (n = 22) (7 males and 93 females). The thoracic Cobb angle was 26.4°, lumbar Cobb angle 25.7°. We investigated the average lateral deviation (RMS) and average surface rotation (RMS). Measurements were taken one day before the patients left the clinic, after a 3 or 4 week in-patient intensive rehabilitation program, in three different postures: Normal posture: No specific instructions: standing with feet in an standardized way. Conscious posture: The patients acquired this posture during intensive daily exercising. Corrected posture: In the most corrected posture, the patients are able to achieve this by using specific muscle tension and specific breathing techniques. We compared the results between the different postures. Then we calculated the results for the different age groups.

Results

There are significant differences in both parameters tested with some more than 40% to 67% greater than the measurement error calculated. The best results were achieved in the second and the third group with the conscious posture. The adult group has the most benefit with the most corrected posture. For the youngest patients, there were no significant changes with the different postures.

Conclusion

Surface measurements can be influenced by artificial postures and therefore cannot be attributed as objective. This is why the surface measurements should be made by someone independent from the treatment process in order to exclude any bias as far as possible. Surface topography may be used for postural monitoring in the rehabilitation process of patients with scoliosis.

References

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