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## Brace treatment with progressive lordotic forces at the thoracolumbar junction in adolescent scoliosis and hyperkyphosis

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### Introduction

Brace treatment options in idiopathic spinal deformities are limited. Most correctional forces are aimed at the apices of curves in scoliosis and in kyphosis. Psychological drawbacks and discomfort in stiff, unnatural designed orthoses result in unsatisfactory compliance.

### Aim

To offer an alternative to present braces. To show that restoration of natural lordosis and concomitant mobility at the thoracolumbar junction by symmetrical lordotic forces, thus only in the sagittal plane, in an adjustable brace offers an interesting alternative.

### Study

Retrospective case control study with radiological results and scores for overall-satisfaction.

### Methods

Review of 91 children with scoliotic and kyphotic spinal deformities wearing a lordotic brace during growth for at least a full year. Measurements of Cobb angles on AP and sagittal standing X-ray's were compared at indication time, first-in brace day and out of brace after a full year. A questionnaire was filled in with scores for satisfaction, compliance and repeated choice.

### Results

Mean age of starting brace was late: 13,8 years (SD2).

In kyphosis (pure or concomitant scoliosis maximum 25°, N = 79)° values for the thoracic curve ( $p < 0.01$ ), the

thoracolumbar curve ( $p < 0.01$ ), de lumbar lordosis ( $p < 0.01$ ) and the pelvic incidence ( $p < 0.01$ ) changed significantly in a paired t-test at one full year brace treatment in comparison with the values at time of indication.

For scoliosis (one curve at least 25°, N = 38) the in-brace correction is significant ( $p < 0.01$ ) of the Cobb angles of thoracic and thoracolumbar curves and the pelvic obliquity. In the sagittal plane even after a full year, a significant correction was seen in the thoracic and thoracolumbar curves. Satisfied and very satisfied were 84.6%. Choice for same treatment was 75.9%.

### Conclusion

This study supports an alternative brace technique for treatment of scoliosis and kyphosis with pure lordosis at the thoracolumbar joint, including periodical adjustments combining passive and active components in redressing tensions. Significant reduction of scoliotic and kyphotic curves is possible during growth. By stepwise restoration of thoracolumbar lordosis and preventing overload in compression during sitting creates improved conditions. Good compliance and satisfaction seems part of the process.

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