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Bracing interventions can help adolescents with idiopathic scoliosis with surgical indication: A systematic review

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Introduction: There is a common agreement that bracing is appropriate for curves between 20 and 40° Cobb during growth, but for larger curves experts' opinions are not consistent.
We designed this systematic review to report the updated evidence about the effectiveness of bracing in scoliosis patients with curves ≥40° and a residual growth period.
Methods: We included Randomized Controlled Trials, Non-Randomized Controlled Trials, prospective and retrospective observational studies, case series addressing the effect of bracing in patients with idiopathic scoliosis during growth with curves ≥40° Cobb published from 2000 onwards.
We considered Cobb angle changes at the end treatment:
• average worst Cobb angle before and after treatment;
• percentage of patients with improvements (reduction >5° Cobb), progression (increase >5°) or stability (±5°);
• percentage of patients with curves larger than 45°;
• percentage of patients with curves larger than 50°;
• percentage of surgically treated patients.
Results: Nine papers (563 patients, average worst curve of 44.8°) were included: 4 retrospective case series, 2 retrospective and 2 prospective cohort studies, 1 prospective controlled study. The overall quality was good with respect to the type of design.
Due to the characteristics of the studies, a meta-analysis was not performed. Results have been reported narratively including tabulation of data and a summary of the evidence.
Considering the whole sample of studies for which we have complete data (563 patients), 32% of patients improved (>5° Cobb change), 26% were stable and 42% progressed. The rate of improvement ranged from 11% to 78% while the rate of progression ranged from 4% to 64%. Surgical rates were not reported in all studies, but ranged from 0 to 58%, with relevant differences in different studies.
In 3 studies, the number of patients with curves below 45° largely increased after treatment. In one paper, the percentage of patients with curves larger than 45° increased while in another those larger than 50°.
Considering the retrospective studies (332 patients, 44.4° ±3.5° Cobb at baseline), 18.4% of patients improved (>5° Cobb change), 30.1% were stable and 51.5% worsened (Table 2). For prospective studies, both a Per Protocol analysis and an Intention-to-treat (ITT) are available. For the Per protocol (198 patients, 47.8° ±5.2° Cobb at baseline) 61.9% of patients improved, 22.9% remained stable, and 15% progressed while for the ITT (171 patients, 48.2° ±5.2° at baseline) 59% improved, 11% remained stable and 29% progressed.
Conclusions: According to the findings of this systematic review there is very low-quality evidence supporting the use of bracing in severe curves, when patients are motivated and willing to avoid surgery. Nevertheless, we need more research with coherent outcome criteria. From a clinical standpoint, the advantages and limitations of bracing in such a condition should be discussed with the patients and family, compared with those of surgery with the aim of reaching a shared a decision making. Further and better high-quality studies are needed to rule out the current limitations, as well as to explore which brace, and which protocols of treatment, are more effective for patients with severe scoliosis.