Treatment with Schroth therapy and Cheneau brace can reduce Cobb angle in AIS patients even when starting with late skeletal maturity

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Introduction: In the Netherlands, it is common for patients with adolescent idiopathic scoliosis (AIS) to be observed by an orthopedic surgeon. This is also the case for patients with Risser 3 – 4 or Cobb angles above 45°. Conservative treatment is not often advised for this group of patients. Schroth therapy combined with Cheneau bracing have yielded promising results in other countries.
Research Question: 1. What is the effect on the Cobb angle in children (Risser 0 - 4) with AIS, even with large curvatures, treated by the combination of Schroth therapy and Cheneau bracing?
2. What is the effect in the subgroup with Risser 3 - 4?
M**ethods:** A retrospective observational study was conducted on a cohort of 40 patients with AIS. Patients underwent treatment with Schroth therapy combined with Cheneau bracing. Inclusion criteria were: 8 - 17year old patients with idiopathic scoliosis, both genders, all curve types, curves between 10 - 55°, Risser < 5. Patients with comorbidity or who had prior therapy before treatment were excluded. Age and the initial Risser score were (mean and standard error) 12.95±0.36 and 1.75±0.27. Schroth therapy consisted of a weekly individual or group therapy with a daily home exercise program. Patients wore Cheneau braces for 18-20 hours a day until weaning procedure.
Results: Radiographic measurements of Sum of Curves (SoC) and Primary Curves (PC) before and after at least 2 years of treatment were made. Results were categorized to “worsened” (change of angle>5° for PC, >10° for SoC), “improved” (<-5° for PC, <-10° for SoC) or “remained stable” (otherwise). Furthermore, patients were divided into early skeletal maturity (Risser 0 – 2, N=24) and late skeletal maturity (Risser 3 - 4, N=16) for further analyses. Mean SoC and PC of the whole patient group before the treatment were 59.83°±2.45 and 36.28°±1.24, respectively. In the last measurement, they were 50.95°±2.50 and 30.23°±1.75, showing a significant effect of the treatment ($p<.001$, repeated-measures ANOVA). The treatment resulted in improvements of SoC and PC in 50.0% and 52.5% of the whole patients, respectively. In three cases (7.5%), PC and/or SoC values worsened.
For patients with late skeletal maturity, mean SoC and PC were 64.69°±3.18 and 38.69°±1.43 before treatment. In the last measurement, SoC and PC became 53.75°±2.94 and 31.69°±1.50, with improvements of SoC and PC in 56.25% and 56.25%, respectively. None of the patients with late skeletal maturity worsened.
Conclusion: Treatment with Schroth therapy with Cheneau bracing reduced SoC and PC significantly even with large curvatures. Interestingly, the results showed significant reductions of SoC and PC in patients with late skeletal maturity, although group size was small. These results suggest the effectiveness of this treatment for AIS patients with late skeletal maturity. Further research is necessary.
Discussion: The treatment is effective even for children with Risser 3 – 4 with large curvatures. This contradicts the conventional view (”It is too late for these children”), and calls for re-examinations of possibility of this treatment to cure the patients with late skeletal maturity.
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