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Impact of Bracing in Adolescents with Idiopathic Scoliosis

Clinical Question

Does the use of bracing prevent the need for surgery in adolescents with idiopathic scoliosis who are at risk of curve progression?

Bottom Line

When compared with observation, bracing significantly slows progression of high-risk curves to the surgery threshold (Cobb angle greater than 50 degrees), with a number needed to treat (NNT) of 4 in the randomized portion of the trial. This benefit is greater with more daily hours of brace wear. (Level of Evidence = 1b)

Synopsis

The Bracing in Adolescent Idiopathic Scoliosis Trial (BRAIST) enrolled 242 affected adolescents; 116 were randomized to wear a brace or to observation, whereas 126 teens preferentially chose between the two options (the preference cohort was added because of low enrollment in the randomized trial). All patients were between 10 and 15 years of age, were previously untreated, and had a Cobb angle between 20 and 40 degrees and Risser skeletal immaturity grades of 0, 1, or 2. Brace-wearing youth were prescribed a rigid thoracolumbosacral orthosis to wear for a minimum of 18 hours per day; embedded temperature sensors recorded total daily use. Clinical, radiographic, orthotic, and quality-of-life scores were collected every six months. Clinicians and patients were aware of treatment, but all radiographic evaluators were unaware of bracing vs. observation status. Patients could change treatment, if desired.

The randomized and preference cohorts differed significantly by sex distribution, degree of vertical rotation, length of time between diagnosis and study enrollment, and who first noticed the scoliosis. The primary outcome for the study was determined when one of two conditions was met: treatment failure with curve progression to greater than 50 degrees, or treatment success with curves of less than 50 degrees and skeletal maturity. An analysis of all 242 adolescents found a treatment success rate of 72% among brace wearers and 48% in the observation group (NNT = 4). The odds ratio for a successful outcome with bracing was 1.93 (95% confidence interval, 1.08 to 3.46). When looking at data only from the randomized patients, the treatment success rate was 75% among brace wearers and 42% in the observation group (NNT = 4). The odds ratio for success with bracing in randomized patients was 4.11 (95% confidence interval, 1.85 to 9.16). Longer duration of brace wear was correlated with a higher success rate; those in the lowest quartile had a success rate similar to no treatment, whereas those wearing the brace for at least 12.9 hours per day had a 90% success rate. A secondary outcome assessing self-reported quality-of-life scores did not demonstrate significant differences between bracing and no bracing at baseline analysis or during final assessment. The results may be biased by nonrandom treatment assignment for more than one-half of the total patients, as well as factors affecting brace dose response, including curve flexibility and type.

Study design: Randomized controlled trial (nonblinded)

Funding source: Government

Allocation: Concealed

Setting: Outpatient (specialty)

Reference: Weinstein SL, Dolan LA, Wright JG, Dobbs MB. Effects of bracing in adolescents with idiopathic scoliosis. *N Engl J Med*. 2013;369(16):1512-1521.

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