



O54.36 Adolescent idiopathic bracing success rates influenced by time in brace: Comparative effectiveness analysis of the BrAIST and ISICO cohorts.

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Introduction: Studies of bracing effectiveness from North America have frequently shown worse outcomes than many studies from European centers. This could be due to sample characteristics or treatment approaches such as brace design, wear time, standard weaning protocols or concomitant physical therapy.

Objective: To compare bracing outcomes in prospective datasets from the BrAIST and the ISICO.



Methods: Sample: Braced patients, age 10-15, Risser < 3, Cobb angle 20 - 40°, observed to Cobb angle of ≥40° and/or ≥Risser 4. Risser grades and Cobb measurements were independently confirmed by the BraiST team.

Comparators: Bracing per BraiST (TLSO) and ISICO protocols (SPoRT rigid braces with or without SEAS exercises with cognitive-behavioral support); baseline characteristics (sex, age, body mass index (BMI), Risser grade, Cobb angle, and curve pattern) and average hours of wear per day. Other differences between programs (e.g. SEAS participation, type of brace, structured weaning protocol) were captured by a variable named "SITE."

Outcome: Treatment failure (≥40 degrees before Risser 4).

Statistical analysis: Analyses comparing baseline characteristics, followed by analyses of the relationship between risk factors, treatment components and outcomes within and between the cohorts. Logistic regression was used to determine the factors associated with the outcomes in the combined cohort. The final model was chosen using the Akaike information criteria.

Results: 157 BraiST and 81 ISICO subjects were included. Average Cobb angle, %, with a thoracic apex and with low BMI were similar between SITES. The ISICO sample had more boys (17 vs 8%) and was older (12.86 vs. 12.47 years) with a higher % at Risser 2 (19 vs. 10%). The average wear time was 18.31 in the ISICO and 11.76 hours in the BraiST cohorts. 31% of the ISICO cohort participated in SEAS, and only 1 had a treatment failure, so the contribution of SEAS cannot be determined with these data.

12% of the ISICO and 39% of the BraiST cohorts had treatment failure. The full logistic model included all baseline factors plus the treatment variables SITE and wear time. In order of impact, the final model included the variables wear time,

Cobb, age, BMI, thoracic apex, and Risser. With these variables in the model, SITE was not a significant predictor.

The adjusted odds of failure were higher for those in the lowest 5th percentile of BMI (OR=19.25; 3.22-115.16), with a thoracic apex (OR=10.13; 2.48-41.45) and at Risser 0 (OR=2.24; 0.97-5.18); the odds increased with the Cobb angle (OR=1.23; 1.14-1.36), and decreased with age (OR=0.49; 0.34-0.69) and hours of wear (OR=0.84; 0.79-0.90).

Conclusion: The lower failure rate in ISICO patients was likely due to more hours of brace wear. BraiST patients knew their doctors questioned the effectiveness of bracing. At many centers, the orthopaedic and orthotic teams were not highly integrated. The ISICO approach, however, emphasizes the essential role of bracing maximized by a cohesive team of physicians, orthotists and physiotherapists. These differences may have contributed to the lower hours of brace wear seen in the BraiST cohort, and the associated difference in outcomes. Future studies involving larger samples are necessary to determine the independent effect of SEAS or other components of the ISICO approach on AIS outcomes.

Significance: This study corroborates previous studies on risk factors and provides additional evidence for wear time in preventing significant curve progression in high risk AIS patients.