Orthotics
A Correlation to Spinal Biomechanics

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This student research project was designed to take the first steps toward determining whether any positive changes on spinal gravity lines can be detected after a trial of flexible orthotic devices on subjects who exhibit asymmetric flexible pes planus and spinal towering.

METHODS

This study was approved by an IRB at Logan College of Chiropractic. Seven students who passed all entry criteria and gave, in writing, informed consent to participate were enrolled in the study. Study subjects were fitted with orthotics that they wore for 2 weeks. Anteroposterior full-spine radiographs were obtained both pretrial and posttrial, with the posttrial radiographs taken with orthotics in place. A spinal gravity line (plumb line) was constructed in both pre- and postorthotic radiographs that ran from the level of the apex of the odontoid process and intersected with the second sacral tubercle. The right or left deviation of the odontoid versus the plumb line intersecting with the second sacral tubercle was measured on all radiographs. Data analysis consisted of descriptive statistics and a two-tailed t test.

RESULTS

Of the 10 subjects who began the study, seven completed the protocol. The study showed, qualitatively, that six of the seven subjects involved moved in the direction of correction (mean pretrial deviation 11 mm; mean posttrial deviation 3 mm; $p = .158$).

DISCUSSION

Lack of a statistically significant difference may be an artifact of the small sample size, rather than a reflection of the ability of the orthotics to create a significant change. There is a distinct possibility that larger sample sizes will change the outcome.

There are several limitations to this study. Patient compliance was not assessed. Careful control to eliminate the possibility of radiographic artifacts arising from errors of positioning was not employed. Interexaminer reliability of the primary outcome measure used in this study is unknown. Future studies of this type should include efforts to eliminate or minimize these potential confounding factors. The quantitative improvement seen in six of the seven subjects suggests the desirability of future studies with a larger sample size.

CONCLUSION

Further research is needed on the use of orthotic devices for the correction of spinal distortions.