

The Effects of Side-Posture Positioning and Spinal Adjusting on the Lumbar Z Joints: A Randomized Controlled Trial With Sixty-Four Subjects

Spine, Volume 27, Issue 22, November 15, 2002, pgs. 2459-2466

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FROM ABSTRACT:

Study Design.

A blinded, randomized controlled trial was conducted.

Objective.

To test the hypothesis that chiropractic side-posture manipulation (adjusting) of the lumbar spine separates (gaps) the zygapophysial (Z) joints.

Summary of Background Data.

Spinal adjusting is thought to gap the Z joints, yet no studies have conclusively validated this hypothesis, and some investigators have reported that the lumbar Z joints do not gap during rotation.

Methods.

For this study, 64 healthy student volunteers (32 men and 32 women) ages 22 to 30 years with no history of significant low back pain were randomized into four groups of 8 men and 8 women each.

Interventions included lumbar side-posture spinal adjusting (manipulation) and side-posture positioning.

Anterior to posterior measurements of the Z joints from MRI scans taken before and after side-posture spinal adjusting and before and after side-posture positioning were compared.

Results.

Observers performing the measurements were blinded as to group and first and second scans. Reliability of the measurements was established. Differences were found between the groups .

Side-posture positioning showed greater gapping than the control condition; side-posture adjusting showed greater gapping than the control condition, and side-posture adjusting showed greater gapping than side-posture positioning.

Conclusions.

Spinal adjusting produced increased separation (gapping) of the Z joints.

Side-posture positioning also produced gapping, but less than that seen with lumbar side-posture adjusting.

This study helps to increase understanding about the mechanism of action for spinal manipulation.

THESE AUTHORS ALSO NOTE:

“One component of spinal dysfunction treated by chiropractors has been described as the development of adhesions in the zygapophysial (Z) joints after hypomobility.”

“This hypomobility may be the result of injury, inactivity, or repetitive asymmetrical movements.”

One beneficial effect of spinal manipulation may be the “breaking up” of fibrous adhesions that develop in hypomobile, or “fixed”, Z joints.

“Spinal adjusting of the lumbar region is thought to separate, or gap, the articular surfaces of the Z joints.”

“Theoretically, gapping breaks up adhesions, thus helping the motion segment reestablish a physiologic range of motion.”

The objective of this study was to determine whether differences in gapping of the lumbar Z joints could be quantified from MRI scans in healthy volunteers before and during lumbar side-posture positioning and before and after lumbar side-posture spinal adjusting.

DISCUSSION

The authors “found significant differences between several groups in this study, with the group that received chiropractic adjustments and remained in the side-posture position showing the greatest increase in gapping.”

“This finding is consistent with the hypothesis that chiropractic adjusting gaps the Z joints.”

“The thrust given during the chiropractic procedure [adjustment] had the effect of increasing the gapping of the Z joints.”

The authors believe that the differences in gapping found during this study are not only significant, but that they may also be clinically relevant.

"The average difference between the control subjects and the subjects that received a chiropractic adjustment and remained in side-posture position was 1.33 mm."

"The difference between the control subjects and the subjects placed in side-posture position was 0.94 mm."

The largest gapping from adjusting was 2.24 mm, which is a "considerable gap in a joint as small as the Z joint."

"It can be logically assumed that the Z joints gap a greater distance during the forceful loading of the manipulative procedure than recorded in this study."

The "residual" gapping documented in the adjusted group is what was seen during the 15-to 20-minute MRI scan taken immediately after the adjustment.

"Because such adhesions are currently thought to be composed of collagen fiber bridges between the articular surfaces, any perceptible gap would be theoretically capable of breaking the bridging of the microscopic fibers that make up such adhesions."

Again, the authors suspect that in the adjustment group much greater gapping actually was achieved than documented in the post-adjustment MRI, "contending that at least some adhesions, if present, within a hypomobile Z joint would break under the forces generated during this type of manipulation." [IMPORTANT]

Key Points From Authors

- (1) One of the hypothesized beneficial effects of spinal adjusting has been related to gapping of the zygapophysial (Z) joints.
- (2) Lumbar side-posture adjusting gapped the Z joints more than side-posture positioning.
- (3) Gapping of the Z joints provides insight into the mechanism of action for chiropractic spinal adjusting.

KEY POINTS FROM DAN MURPHY

- (1) Significant greater gapping (separation) of the Z joints was noted, on MRI, in the post adjustment group.
- (2) It can be logically assumed that the Z joints gapped more during the forceful loading of the spinal adjustment than the separation recorded in the MRI.
- (3) Articular hypomobility [subluxation] may be the result of injury, inactivity, or repetitive asymmetrical movements.
- (4) Reduced mobility can be caused by adhesions and/or fibrosis in the Z joint.
- (5) Spinal adjustments separate (gap) the Z joints to a great enough degree to breaking up Z joint fibrous adhesions.
- (6) Adjustment gapping of Z joints breaks up adhesions, thus helping the motion segment reestablish a physiologic range of motion.

COMMENTS FROM DAN MURPHY

These authors are from National University of Health Science. They use the word "adjusting" and "chiropractic" in the abstract and article, and use the word "adjusting" in the title.

I learned chiropractic orthopedics from the great Richard Stonebrink, DC. Dr. Stonebrink taught us about "The Fibrosis Of Repair" as related to spinal pathology and spinal adjusting. This article supports the decades of chiropractic orthopedic teachings of Dr. Stonebrink.

Restated and paraphrased:

Adjusting is using bones as levers to break adhesions and remodel fibrosis in an effort to re-establish normal motion, improving local biomechanics, local neurology, and benefiting their systemic neuro-mechanical influences.