The Effect of Sacro Occipital Technique Category II Blocking on Spinal Ranges of Motion: A Case Series

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Abstract

Objective: To describe changes in lumbar and cervical range of motion measurements after supine pelvic blocking as used in Sacro Occipital Technique (SOT).

Methods: Five subjects with sacroiliac distortion and instability were recruited and selected for SOT. Cervical and lumbar ranges of motion were measured before and after category II blocking procedures used to change pelvic mechanics. Pre- and post-measurements were taken by a blinded assessor using a Zebris ultrasonic motion detector.

Results: Changes were found in the lumbar spine only. Increased ranges of lumbar motion occurred in all planes except extension (21%-57%).

Conclusion: Supine pelvic blocking as used in SOT affected lumbar ranges of motion in these 5 cases. This may indicate that functional change in the pelvis results in changes in lumbar motion, especially lumbar flexion. Larger data sets are needed for further study. (J Manipulative Physiol Ther 2005;28:719-723)

Key Indexing Terms: *Spine; Range of Motion, Articular; Manipulation, Chiropractic; Instrumentation*

Range of motion changes after spinal manipulation have been studied by Yeomans and others.[1-4] Two of these studies investigated changes in motion of one body region after manipulation in another. A study by Pollard and Ward[5] showed an increase in hip joint range of motion, as measured by the straight leg raise test, after upper cervical adjustment. Kessinger and Boneva[6] showed both short- and longer-term improvements in lumbar range of motion after upper cervical adjustments. Wittingham and Nilsson studied the effect of toggle recoil adjustments on cervical range of motion and found an increase in motion after adjustments were given. However, Nilsson et al[7] found only temporary passive cervical motion increases in patients receiving both toggle recoil and diversified cervical adjustments.

A commonly used procedure is Sacro Occipital Technique (SOT) category II pelvic blocking. A large survey done by the National Board of Chiropractic Examiners reported 41% of respondents used some degree of SOT in practice.[8] This method of placing wedges under the iliac crest and acetabular region, as the patient is lying supine, is purported to enhance sacroiliac stability by removing stresses from the sacroiliac interosseous ligaments. The SOT model is not based on spinal range of motion and motion palpation of the spine is not a formal part of the technique.

Normal lumbar function is, to a degree, dependent upon normal pelvic function. The sacroiliac joint creates a kinetic link between the spine and the lower extremities.[9] The four spinal regions are interdependent on each other for full spinal normal function. It is not known whether pelvic blocking as used in SOT can affect this function.

The purpose of this case series is to determine whether supine pelvic blocking, used on patients with proprietary indicators of pelvic instability and/or mechanical imbalance, has any effect on lumbar or cervical ranges of spinal motions.

Materials and Methods

Ten subjects were interviewed by telephone first, in response to posted notices and a published advertisement in a local weekly newspaper. Inclusion requirements were as follows: subjects had to be 21 to 45 years of age; no history of spinal pathology (infection, fracture, or metastatic disease); and not under current chiropractic care. Patients also had to have proprietary SOT indicators of category II (sacroiliac weight-bearing dysfunction) as described by

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De Jarnette[10] determined to exist by patient examination. The three indicators are the following: (1) lateral sway of the entire spine to the left or right away from center as seen on plumb line analysis; (2) unilateral palpatory pain and hypertonicity within the medial upper trapezius and scalene muscles; and (3) palpatory muscle weakness of the posterior deltoid muscle during deep palpation of the origin of the sartorius or insertion of the rectus abdominus muscles on the anterior pelvis deltoid (known as the arm fossa test).

Although reliability studies have not been done for category II posture analysis (lateral sway), Harrison et al[11] and Vernon[12] have shown interexaminer and intraexaminer reliability in assessing posture using plumb line analysis. Weakness of the arm fossa test on symptomatic low back patients has been established by Leboeuf.[13] Other indicators also exist but are less indicative of the category II situation. This study was approved by the Institutional Review Board of Life University.

Subjects

Five subjects met the inclusion criteria and gave written informed consent to both the measurement protocol and the pelvic blocking. Four of the subjects were female and one was male. All patients were white.

Outcome Measurements

Each subject had lumbar and cervical ranges of motion measured in the sagittal, transverse, and coronal planes, using a Zebris ultrasound motion detector (Zebris GmbH Tuebingen, Germany). Reliability and validity studies have been conducted on this device by Solinger et al.[14] The range of motion measurements were assessed by a researcher blinded to the intervention. Each region (lumbar and cervical) was fitted with ultrasound emitters that send position information to an ultrasound detector mounted on a movable stand. In the analysis of cervical and lumbar spinal column movements, the synkinesis between lateral inclination and pelvic rotation as well as the coordination between hip and lumbar spine during flexion/extension are recorded. In addition, dorsal motion is subtracted from cervical motion to get a true inclinometric reading. In the lumber region, pelvic motion is subtracted from lumbar motion. During the measurement, the subject was asked to perform forward flexion and extension, lateral bending, and axial rotation to each side. Each motion was performed 7 times.

Intervention

After the initial measurements were taken and recorded, a schedule of sessions of supine category II SOT pelvic blocking was arranged with each patient. Ranges of motion were then reevaluated when the proprietary indicators for pelvic blocking disappeared.

Table 1. *Mean changes in lumbar flexibility*

Motion measured	Mean pre-blocking motion	Mean post-blocking motion	Mean change (%)
Flexion	49.72°	63.08°	27
Extension	14.66°	14.1°	−4
Right rotation	14.65°	19.1°	30
Left rotation	14.75°	17.85°	21
Right lateral flexion	15.32°	23.93°	57
Left lateral flexion	14.68°	22.33°	53

The number of visits for each patient ranged from 3 to 8, with most visits requiring 15 minutes to complete the analysis and/or blocking procedure. When the category II SOT proprietary indicators for pelvic blocking no longer appeared, the patient was seen one more time to confirm no further need for blocking. Visual analog scale measurements of subjective pain varied from 7 (10 being the worst) down to 1 on the first visit and decreased 3 to 4 points over 3 to 4 visits. These measurements were made, although the purpose of this study is to measure motion changes.

Data Analysis

Data were entered into an Excel spreadsheet. According to the protocol by Lantz,[15] the fourth, fifth, and sixth repetitions for each motion for each subject were computed for pretreatment and posttreatment averages. Mean values and percent changes [(pre − post) / pre] and global or regional changes were calculated.

Results

Of the 5 subjects, 4 had a history of low back pain and 3 had a history of cervical pain. Three had a history of a motor vehicle accident, with one requiring short hospitalization for traction and therapy 5 years before this study. The mean age of the subjects was 33.4 years, and the mean number of visits for category II blocking was 4.8. Three to 7 pelvic blocking treatments were applied, with treatment ending when the indicators for blocking were no longer present. The symptoms of cervical and/or lumbar pain were not monitored during this study.

There were minor increases in mean cervical ranges of motion of 2° to 6°, with a slight loss of 3° in cervical left lateral flexion. Cervical increases in flexibility averaged 1.5°. Increases in lumbar motions ranged from 3° to 13°, with an average increase of 6.1° (Tables 1 and 2).

The greatest change was in cervical range of motion in one subject (120% increase in total cervical rotation); however, in another subject, total cervical rotation decreased by 63%. It is interesting to note that in the subject with the 120% increase, the pretreatment total cervical rotation was 63°, whereas in the subject with the 63% decrease, the