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CLINICAL EVIDENCE

Non-surgical manual spinal neural decompression adjustment of the Y-axis: Can the results be quantified?

A case report.

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Abstract: A measurable physiological change was observed in a test subject after the manual spinal neural decompression adjustment of the y axis via the '*Ring Dinger*' procedure. The ability to measure physiological changes would allow for a full study of the chiropractic procedure using standard research practices. A minimum of twenty-five subjects in a pilot study should be used to establish the necessary limits for established statistical analysis.

Indexing Terms: Chiropractic, spinal decompression, traction, Ring Dinger, technique.

Introduction

Spinal decompression has been around for many years although it has been argued that there is a lack of clinical evidence to support the efficacy of this treatment. This paper seeks to determine whether or not a physiological measurement can be taken to quantify the decompression procedure so that a controlled experiment may be designed to properly demonstrate the efficacy of this procedure.

... this case report demonstrates observable changes in a related measured following Y-axis decompression. A pilot study is recommended to better understand the relationship and the effect size.

Non-surgical spinal decompression therapy uses a traction table to stretch the spine so that chiropractors are able to relieve pressure on the discs and vertebrae in either the lumbar or cervical spine regions. For this procedure, the patient is strapped at the pelvis, either face down or face up on a computer-controlled table for 30-45 minutes while the table is rotated to allow gravity to stretch and lengthen the impacted area of the spine. (Mauricio Chiropractic, 2018) Another procedure uses a specialized decompression table that allows the supine patient to be pinned to the decompression table using two adjustable bolsters while the legs are elevated parallel to the table surface. This allows the chiropractor to decompress the entire spine from the occiput to the sacrum with a high velocity low amplitude pull adjustment on the y-axis in one maneuver. (Johnson, 2020)

In order to provide evidence of efficacy for the decompression procedure, a repeatable measurement must be made to document changes observed in the subject both before and after the decompression

procedure. The purpose of this case study is to demonstrate that such a measurement may provide sufficient information to allow an objective efficacy decision to be made.

Materials and methods

Chiropractic Methods

The piece of chiropractic equipment used in this pilot study is unique but similar to other traction decompression tables such as the DRX 900 decompression table to traction the spine on the Y-axis. Another similar technique is done with a Pettibon Y strap but does not incorporate the pins to fix the pelvis while applying the trust (adjustment manoeuvre). It is also similar to traction devices including decompression tables manufactured by Hill Labs which stretch the spine on the y axis and have been used in chiropractic, medical clinical and hospital environments for years.

With the supine patient lying comfortably on the table, a sensitive actuator lifts the lower legs up to a parallel position flattening the lumbar spine biomechanics relaxing the musculoligamentous paraspinal and intraspinal ligaments so as to allow the licensed practitioner to deliver the high velocity low amplitude adjustment using a quick pulling movement. This is accomplished using a wet towel against the occiput (posteriorly) and the mandible (antero-inferiorly) with the spine in its most relaxed supine posture with the head lying flat back against the table preserving the cervical lordosis. The bolster pins are placed in the holes on the table on the superior aspect of the iliac crest bilaterally to provide a fixed lever with soft cushions around the steel pins to keep the pelvis from moving during the adjustment procedure. The pin placement is between the iliac crest and the lowest ribs squeezing the soft tissues tight so there is no movement of the segments below L5 fixated at the iliac crest.

Fine Motor Control Testing Methods

To monitor the physiological changes the patient is expected to experience, changes in the fine motor control of the hands will be measured and recorded using the SR-3053 system produced by RedOak Instruments. This system consists of a hand-held sensor that the subject squeezes with the thumb, index and small fingers simultaneously when given an asynchronous prompt from a computer program. Measurements are made every millisecond on all three digits which are then used to provide information on strength, reaction times, coordination and timing errors between the digits for each hand separately. The bio-mechanical test is non-invasive, rapid, taking about seven minutes to complete and the results are available within minutes from a remote HIPAA compliant server system. The procedure has been previously described. (Lefeber, et al., 2018; Karasch, et al., 2015; Mireles, et al. 2013)

Test Subject

The patient, YMZ-4382, a 32-year-old male Veteran entered with a history of lower back pain and leg pain to their mid-calf on the right leg which has gotten worse over the past 5 years. He fell off an F-16 fighter jet knocking him out. He has had a previous lumbar discectomy at L 5-S1 disc which did not give him relief. VA supervised care included PT, chiropractic adjustments, massage, opioid medication leading to opioid dependence, and ultimately led the VA to refer him for non-surgical manual spinal decompression on the Y axis adjustment, i.e., the '*Ring Dinger.*'

The diagnosis is nonspecific lower back pain and lumbosacral radiculopathy, (Sciatica). Comorbidities include spondylolisthesis, facet arthrosis, osteoarthritis, cardiovascular hypertension, osteoporosis, hyperlipidemia, smoking, obesity. Due to the diagnosis on nonspecific lower back pain, exclusions such as pathology (cancer), space occupying lesions, fractures, infection, need to be ruled out.

The comparison is provided by a 32-year-old male engineer with no history of injury. His results, shown by AJD-4071, were collected over an hour and a half, and no therapy administered before, during, or after the testing.

Study Procedure

The test subject was a regularly scheduled patient at the clinic. He was advised of the project and asked if he wished to be a part of the pilot study. Agreeing, he was asked to sign a consent form and was then given a baseline test with the SR-3053 system. After the baseline test, he was taken into a treatment room for the decompression procedure. Once the decompression treatment was completed, he was retested using the SR-3053 to determine whether any physiological changes were evident. For comparison, a second subject was tested outside the chiropractic offices to determine what variations should be expected from test to test without chiropractic treatment.

Results

The results of this comparison are shown in Table I. The test subject took two series of tests while the control took three series. The summary scores shown are derived from the data presented in Figs 1 and 2 which show a variety of test parameters.

Each series of tests consists of four individual tests: right hand, left hand, right hand, and left hand.

The first test for the right hand and the left hand is shown in the open/lightly shaded bars while the second tests are shown as solid bars.

Table I - Summary Scores

	Subject: YMZ-4382		Control: YMZ-4382	
	Left	**Right**	**Left**	**Right**
Series 1	0.50	0.57	0.25	0.20
Series 2	0.43	0.42	0.22	0.27
Series 3			0.23	0.21
Ave	0.47	0.50	0.23	0.23
StDev	0.05	0.11	0.02	0.04

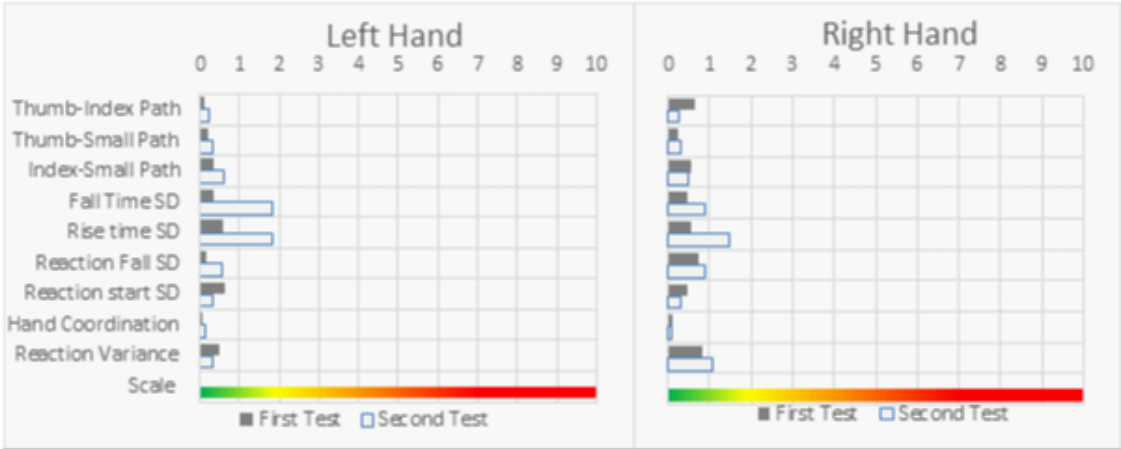

Figure 1: Series 1 tests for YMZ-4382 collected prior to treatments.

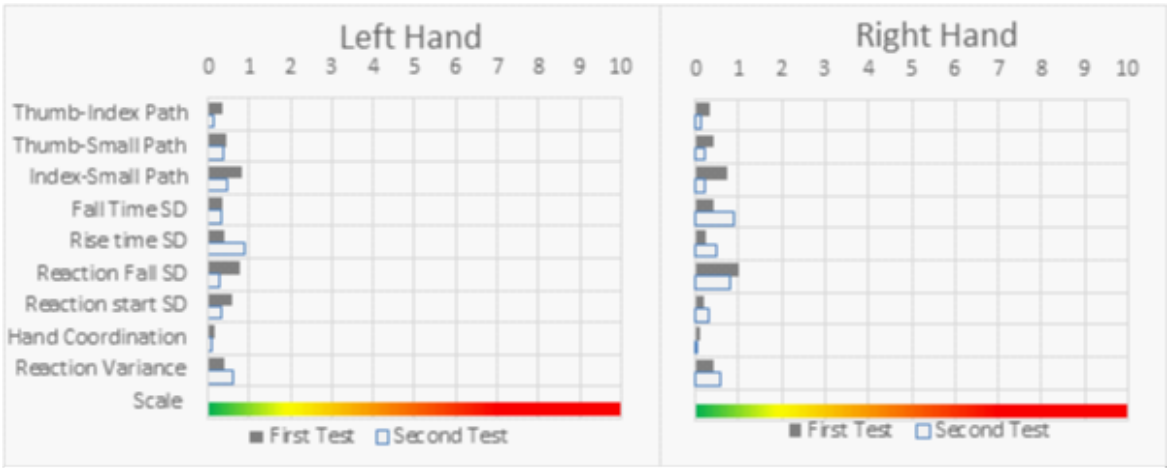

Figure 2: Series 2 tests collected for YMZ-4382 after chiropractic treatment

Discussion and conclusion

The data indicate that the test individual did show an observable improvement immediately after the chiropractic treatment. The change was more than would be expected and was observed for the control subject who did not receive the same chiropractic treatment. This would suggest that a full study should be feasible and practical to produce data for statistical analysis.

It should be reasonable to enrol at least twenty-five subjects in a pilot study to determine the efficacy of the chiropractic procedure known as the '*Ring Dinger*'. Ideally, at least two, preferably three procedures would be conducted on each subject over the course of the treatment.

The subject would take a preliminary SR-3053 test to establish a baseline, as well as a thorough diagnostic evaluation for co-morbidities present. After the first treatment, a second SR-3053 test would be conducted to determine any improvements in the subject's fine motor control/coordination.

During any subsequent treatments in the following days, the procedure would be repeated: Test with the SR-3053, conduct the chiropractic treatment, and test with the SR-3053 after the treatment.

This would allow for a measure/evaluation of the relaxation or regression from the previous day's treatment ... if any. If possible, this procedure would be repeated during a third treatment as well. This would allow for a series evaluation on each of the subjects to determine the 'rate' of improvement as well as the magnitude of the improvement for the group of subjects.

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Note: Informed consent to chiropractic care and for the provision of data for reporting is held by the practitioner