Case Series

Reduction in Anxiety & Dysautonomia in Five Adult Patients Undergoing Chiropractic Care for Vertebral Subluxation: A Case Series & Review of the Literature

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Abstract

Objective: To chronicle the reduction in severity of anxiety, measured with the Hamilton Anxiety Rating Scale (HAM-A), in 5 patients receiving chiropractic care.

Clinical Features: Five patients from one chiropractic office with a chief concern of anxiety. Pre and post care HAM-A assessments, heart rate variability (HRV) and thermography studies were performed. The patients, aged 24 to 53 years, also presented with a variety of musculoskeletal complaints.

Interventions and Outcomes: Chiropractic care was provided using the Torque Release Technique (TRT) protocol for the assessment and correction of vertebral subluxation. Visit schedules ranged from 6 to 12 weeks. The patients reported improvements in their presenting complaints and additional non-musculoskeletal symptoms. Each patient demonstrated clinically significant improvement in their HAM-A scores improving from moderate/severe anxiety to mild or mild/moderate, and reduction in dysautonomia as measured by HRV and thermography studies.

Conclusion: This case series describes a reduction in severity of anxiety symptoms measured by the HAM-A, as well as improved autonomic nervous system function measured through HRV and thermography, in 5 adult patients receiving chiropractic care.

Keywords: *Chiropractic, anxiety, vertebral subluxation, adjustment, Hamilton Anxiety Scale, Torque Release technique*

Introduction

Mental health disorders, of which anxiety is common, is of growing public concern and are among the highest ranking causes of nonfatal burden worldwide.[1,2] Anxiety disorders were reported as the 9th leading cause of nonfatal burden as measured by years lived with disability.[3] It is estimated that 1 in 9 adults have experienced an anxiety disorder in their lives.[4] In the United States it is estimated that 31.1% of adults will experience an anxiety disorder at some time in their lives, equaling an estimated annual economic burden of $46.6 billion.[5-7]

Anxiety is commonly defined as the presence of "fear or nervousness about what might happen".[8] It is a natural emotion that supports adaptability and promotes survival. The DSM-IV describes the criteria for anxiety disorders as "excessive anxiety and worry (apprehensive expectation), occurring on more days than not for at least 6 months, about a number of events or activities (such as work or school performance)".[9] Anxiety disorders are known to have far reaching effects including impact on quality of life, individual performance, family and social life, and economic sustainability.[10-12] Globally it is recommended that government bodies seek to provide adequate services for the treatment and prevention of mental health disorders such as anxiety.[1]

Psychotherapy, psychological approaches and pharmacological interventions are most commonly employed for mental health disorders such as anxiety, panic attacks and depression.[13] As anxiety symptoms are also common in

individuals experiencing depression, prescription of benzodiazepines and anti-depressant medications is common.[13]

There is a growing usage of complementary and alternative medicine (CAM) approaches for mental health management, with approximately 20% of anxiety sufferers choosing CAM approaches to help manage their condition.[14-17] The most commonly used CAM approaches include relaxation techniques, meditation, massage, and spiritual healing.[17,18] Chiropractic is the largest and most regulated CAM healthcare profession, though is rarely indicated as a CAM choice for people with anxiety.[17-20] As it is so common, individuals presenting for chiropractic care may have mental health concerns such as anxiety, regardless of their primary reason for choosing chiropractic care.[21]

There is limited evidence describing the chiropractic management of and benefit to individuals presenting with anxiety. Two clinical trials report conflicting results, though a recent review reported benefit in isolated cases in clinical practice.[22-24] The purpose of this case series is to chronicle the reduction in severity of anxiety, measured with the Hamilton Anxiety Rating Scale (HAM-A), and improved autonomic nervous system function, measured via heart rate variability (HRV) and thermography, in 5 patients receiving Torque Release Technique (TRT) chiropractic care.

Case Series

This retrospective case series chronicles 5 patients presenting for chiropractic care with a complaint of anxiety. The patients (2 female and 3 male) ranged in age from 24 to 53, and all presented with concomitant musculoskeletal complaints (headache, neck pain, and/or back pain) except for one presenting with concomitant hypertension. All patients declared a goal of decreasing stress and anxiety. Inclusion criteria for the case series included reporting anxiety as a complaint, having a baseline and at least one follow up assessment using the HAM-A, clinical findings identifying vertebral subluxation, receiving chiropractic care for at least one recommended program of care, and having pre and post care HRV and thermography studies. None of the patients received external care or additional lifestyle and home care advice during the course of their chiropractic care.

Outcome measures - HAM-A, HRV & Thermography

The HAM-A is one of the most widely used, clinician-rated instruments for the assessment of severity of anxiety, and is considered reliable and valid.[25,26] The HAM-A is a 14 item questionnaire where each question is rated 0 (absent) to 4 (very severe), with a maximum possible score of 56. A combined total score of >17 out of 56 indicates mild severity, 18-24 mild to moderate severity, and 25-30 moderate to severe severity.

HRV and thermography data were collected using Insight™ scanning technology. HRV is widely used in healthcare and a reliable, valid, objective measure of changes in autonomic nervous system activity.[27] HRV readings are considered more desirable when numerically higher on the y-axis, with balance between the sympathetic and parasympathetic part of the autonomic nervous system represented by a dot point approximating the x-axis (Figure 1).

Thermography is used as an indirect measure of autonomic nervous system function through paraspinal skin temperature.[28] Thermographic readings varying up to 0.6C° are considered within a normal range, variations above that range are coded mild (green), moderate (blue) or severe (red) alteration from normal autonomic function (Figure 2). Both HRV and thermography are recorded at rest, and measure the impact of vertebral subluxation on the autonomic nervous system known as dysautonomia.

Clinical assessment for vertebral subluxation

All patients were initially assessed for vertebral subluxation using a battery of commonly-used direct clinical indicators.[29] Clinical indicators identified in each patient included aberrant static and intersegmental spinal and pelvic motion on palpation, palpated changes in paraspinal muscle tone on soft tissue, and observed prone leg length inequality, Derefield and cervical syndrome tests.

Chiropractic management protocols

Each patient followed a unique care plan for a period of time ranging in duration from 6 to 12 weeks. Patients were typically examined twice weekly at the initiation of care, frequency of visits was reduced as determined by the chiropractor. A progress examination, where each patient completed a follow up HAM-A questionnaire and HRV and thermography studies, was completed at the end of the initial program of care. Subjective improvements as reported by the patient were also recorded.

Chiropractic care was administered using TRT protocol. TRT protocol applies functional leg checking and confirmatory spinal pressure testing procedures for the assessment of levels and directions of vertebral subluxation. Vertebral subluxations are primarily identified at locations of dural attachment, notably the occiput, upper and lower cervical spine (C1, C2, C5), sacrum, coccyx and the pelvis. The application of the chiropractic adjustment is via the hand-held Integrator instrument.[30,31]

Patient responses to chiropractic care

All patients HAM-A scores indicated a reduction in severity of anxiety symptoms. The initial average HAM-A score was 35.8 out of 56 and the average progress exam score was 11.6 out of 56. Three of the patients HAM-A scores demonstrated a reduction from moderate/severe to mild severity of anxiety symptoms, while the remaining 2 patients scores reflected the lowest level of mild/moderate severity of anxiety symptoms, down from moderate/severe. For a complete review of HAM-A scores for each patient see table 1.

Case 1

A 47-year-old male presented with chief complaint of neck pain with concomitant anxiety, headaches, weight management concerns, allergies and decreased immune system function. No previous medical treatment had been

sought for these presentations. His initial HAM-A score was 31, indicating moderate/severe anxiety.

Chiropractic care was provided on a total of 12 visits over a 6-week period. Following chiropractic care the patient reported a decrease in anxiety, less neck and hip pain, better mood and increased energy and diminished allergies. A follow-up his HAM-A had improved to a score of 15, indicating a reduction in severity to mild anxiety. Improvement in autonomic nervous system function was recorded on both HRV and thermography studies (Figures 1 and 2).

Case 2

A 24-year-old male, smoker, presented with a chief complaint of neck pain stemming from a car accident 3 years prior which resulted in fractures of C2 and C3. He also presented with anxiety, headaches and decreased immune system function. He had previously seen a medical doctor and physical therapist for his complaints and was prescribed Paxil which he only took for 2 weeks. His initial HAM-A score was 39, indicating moderate/severe anxiety.

Chiropractic care was provided on a total of 13 visits over a 6-week period. Following chiropractic care the patient reported a decrease in anxiety, better mood, less stress, more energy, less neck pain, better digestion and improvement in sinus issues. A follow up HAM-A showed a score of 2 indicating a marked reduction in severity to mild anxiety. Improvement in autonomic nervous system function was recorded on both HRV and thermography studies (Figures 1 and 2).

Case 3

A 53-year-old male presented with a chief complaint of anxiety, and diagnosed hypertension and high cholesterol. He also had sleep and mood disturbances. The patient was medically managed with Lisinopril and low dose aspirin for the hypertension and cholesterol. His initial HAM-A score was 31, indicating moderate/severe anxiety.

Chiropractic care was provided on a total of 11 visits over a 6-week period. Following chiropractic care the patient reported that he was back in the gym, a decrease in anxiety, resolution of heart palpitations and more focused. A follow up HAM-A showed a score of 5, indicating a reduction of severity to mild anxiety. Improvement in autonomic nervous system function was recorded on thermography studies, while the HRV remained fairly consistent (Figures 1 and 2).

Case 4

A 43-year-old female presented with a chief complaint of anxiety along with headaches, allergies, sleep disturbances, PTSD and depression. She was managed by a neurologist and allergist, and prescribed Topamax and Imitrex for migraines, Loratadine, Montelukast, Fluticasone and Flovent for allergies and asthma, Trazadone for sleep, Prozasin for PTSD and nightmares and Effexor for depression. Her initial HAM-A score was 39, indicating moderate/severe anxiety.

Chiropractic care was provided on a total of 19 visits over a 12-week period. Following chiropractic care the patient reported less frequent headaches, improved movement, less anxiety, improved immune system function, improved digestion and bowel movements, less panic attacks and a decrease in the frequency of use of Imitrex for migraines and had reduced other medications (unspecified). During the time of her care she had experienced the grief of the loss of a close loved one. A follow up HAM-A showed a score of 18, indicating a reduction of severe anxiety to mild/moderate anxiety. Improvement in autonomic nervous system function was recorded on thermography studies, while the HRV recorded lower autonomic activity (Figures 1 and 2).

Case 5

A 46-year-old female presented with a chief complaint of headaches and neck pain with concomitant anxiety and decreased immune system function. No previous medical treatment was administered but patient was taking Zquil and Excedrin for headaches. Her initial HAM-A score was 39, indicating moderate/severe anxiety.

Chiropractic care was provided on a total of 12 visits over a 6-week period. Following chiropractic care the patient reported having stronger, better works outs, feeling healthier, more alert, decrease in neck and low back pain, less frequent headaches, ability to calm herself easier, decrease in anxiety, improved immune system function and had ceased the use of over the counter medications. A follow up HAM-A showed a score of 18, indicating a reduction of severe anxiety to mild/moderate anxiety. Improvement in autonomic nervous system function was recorded on both HRV and thermography studies (Figures 1 and 2).

Discussion

This case series chronicles the reduction in severity of anxiety and improvement in autonomic nervous system function in 5 patients receiving chiropractic care following the TRT protocol. Reduction in severity of anxiety was measured using the HAM-A instrument, and improvement in autonomic nervous system function via HRV and thermography studies.

While there is scientific evidence supporting chiropractic management of people with anxiety, the available literature suggests this is an area that warrants further investigation. The neurobiological mechanisms by which vertebral subluxation effects on nervous system function could lead to altered mental health has been described in a recent review.[32]

Previously established theories and current clinical evidence suggest that an individual's psychological experience and mental health is related to the function of their autonomic nervous system, and that dysregulation of the autonomic nervous system negatively effects that individuals psychological experience.[32,33] Outcome measures of autonomic nervous system integrity, such as HRV and thermography, are commonly used to assess changes following vertebral subluxation correction. Kent concludes it is biologically plausible that vertebral subluxation compromises autonomic nervous system function affecting mental health.[32]

Of the available literature, two clinical trials examined the

effects of chiropractic care, using an Activator instrument, on subjects with anxiety using the Spielberger STAI self-reported instrument with conflicting results.[22,23] Yates *et al*[22] reported significant improvement in anxiety scores following chiropractic care, while Brockman[23] reported no significant improvement between the control and chiropractic groups. A key difference between these 2 studies is the populations used. Yates *et al* used subjects with a medical history of hypertension, where Brockman used subjects that were healthy.

Additional evidence suggests chiropractic care may play a role in reducing anxiety symptoms. Russell and Glucina[24] conducted a recent review of the available literature and reported on a further case series (reporting on 5 adults) and 7 case reports, in all cases there were positive improvements in presenting anxiety symptoms following a program of chiropractic care. Improvements in anxiety symptoms were self-reported in 4 of the case reports, though formal assessment of anxiety using the Generalized Anxiety Disorder – 7 (GAD-7), Patient Health Questionnaire – 9 (PHQ-9), Short Form -36 (SF-36, or Patient Health Questionnaire – 4 (PHQ-4) all demonstrated reduction in anxiety in the reported cases. In the current case series a clinically significant reduction in severity of anxiety symptoms was reported in all cases, in this case measured with the HAM-A instrument.[25,26]

In the 10 available clinical trials, case series and case reports describing the chiropractic management of individuals with anxiety, all studies specifically discuss the correction of vertebral subluxation as the chiropractic intervention.[22-24] The assessment and correction, or reduction, of vertebral subluxation has been reported as being a core objective of chiropractic clinical practice.[34] A primary aim of chiropractic care is to optimize an individual's health and wellbeing through improving nervous system function through the correction or reduction of vertebral subluxation regardless of their symptomatic presentation,[35-38] The Australian Spinal Research Foundation has conceptually defined vertebral subluxation as "a diminished state of being, comprising of a state of reduced coherence, altered biomechanical function, altered neurological function and altered adaptability."[39]

The general theme in reduced anxiety symptoms reported in this case series is congruent with those previously reported in the literature.[22,24] Further, the recorded change in HRV and thermography studies reflect a reduction in nervous system interference attributed to the correction of vertebral subluxation.[27,40] While the current literature is positive, further research is recommended to investigate the role chiropractic care may play in supporting similar populations of people so as to inform clinical practice.

Limitations

As with any case series there are inherent limitations. Study limitations include a small sample size, lack of a control group, and inability to control for confounding factors. While all patients demonstrated reduction in severity of anxiety, it cannot be ruled out that these improvements were due to natural progression, pain reduction in concomitant MSK presentations, or unreported home care or adjunct therapies administered during the program of care.

Conclusion

This case series describes a reduction in severity of anxiety symptoms measured by the HAM-A, as well as improvement in autonomic nervous system function measured through HRV and thermography, in 5 adult patients receiving chiropractic care using the TRT protocol. Considering the burden mental health issues, such as anxiety, have on society globally, further clinical research investigating the role of chiropractic care and its effects on anxiety is warranted.

Highlights

- Anxiety is a major burden on society and impacts on an individual's quality of life
- Anxiety is a major economic burden on society
- Chiropractic care may provide a benefit for individuals with anxiety

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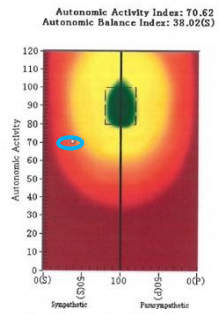
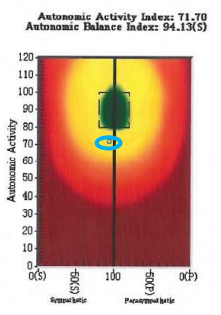
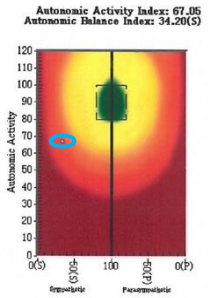
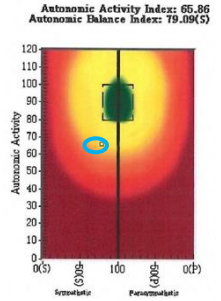
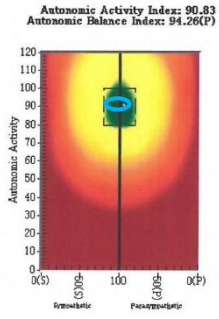
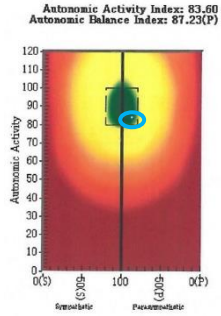
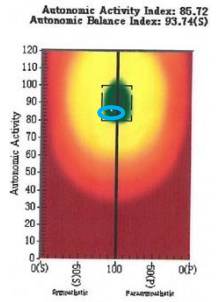
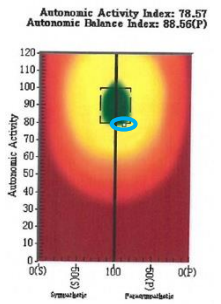
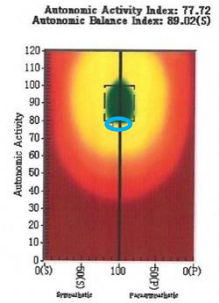
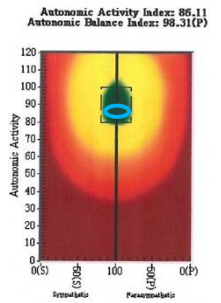
Case 1		
Case 2		
Case 3		
Case 4		
Case 5		

Figure 1. HRV scans pre and post chiropractic care. HRV is represented graphically by 2 factors; a data point (circled in blue) approximating the X-axis signifying sympathetic / parasympathetic balance or deviation to either sympathetic dominance (right side) or parasympathetic dominance (left side); the data point relative to the Y-axis represents autonomic activity where the green area is considered optimal.

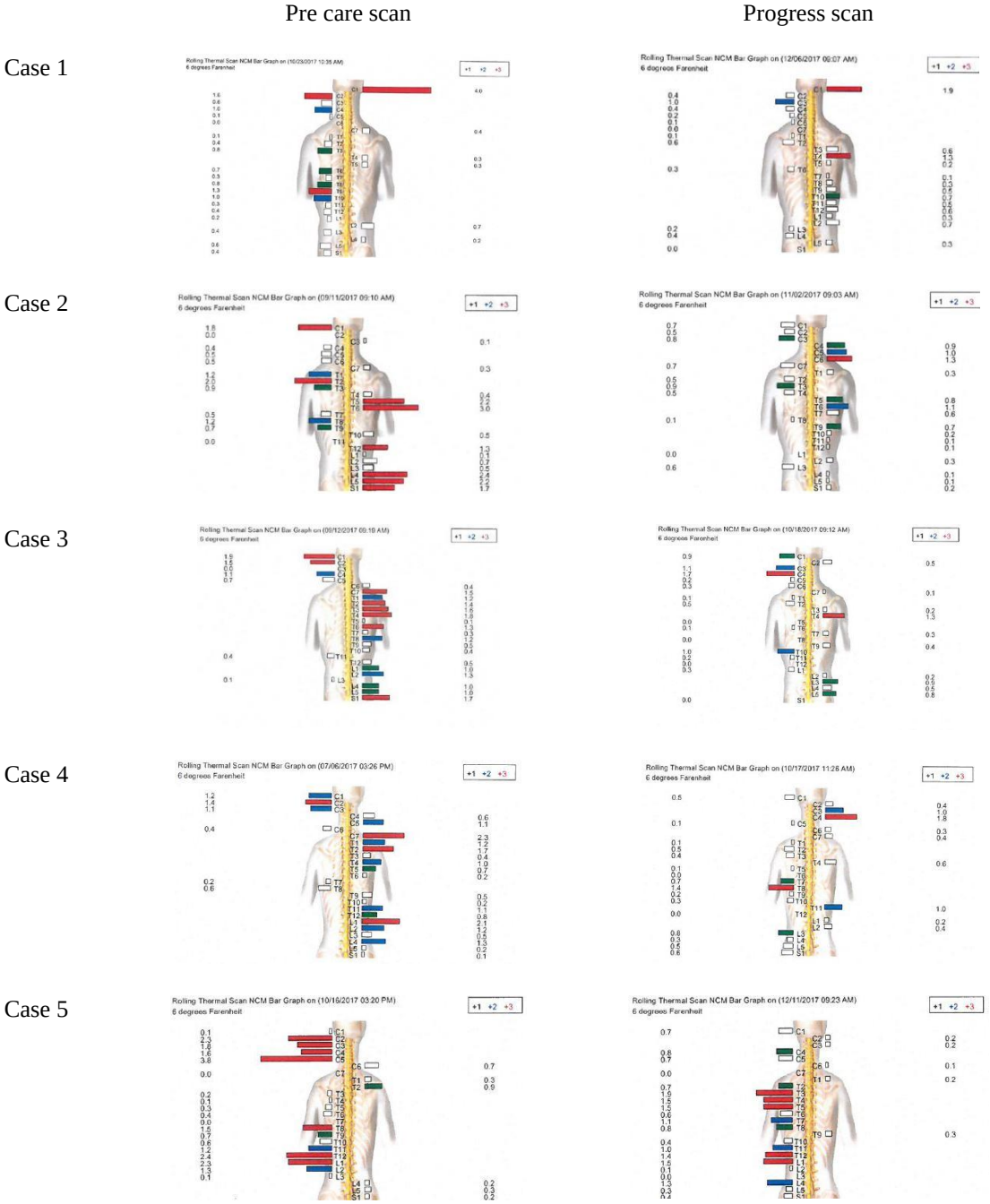


Figure 2. Thermography scans pre and post chiropractic care. Thermographic readings varying up to 0.6Cº are considered within a normal range (white), variations above that range are coded mild (green), moderate (blue) or severe (red) alteration from normal autonomic function.

Case	Initial HAM-A score	Progress HAM-A score
1	31	15
2	39	2
3	31	5
4	39	18
5	39	18

Table 1. HAM-A scores for each patient (initial and progress exam scores)