

Reduction in back and joint pain and increase in performance in a 10-year-old male competitive swimmer: A case report

Jennifer Luu, Ruth Postlethwaite and Clare McIvor

Background: A ten-year-old male presented for Chiropractic care with primary complaints of low back, shoulder and ankle pain. While his original care plan was to address musculoskeletal complaints, his swimming times were monitored over the course of care.

Intervention: The patient underwent a course of Chiropractic care spanning six months, during which time he was managed using vertebral subluxation-based Chiropractic care including diversified Technique and Activator Methods®.

Outcomes: Along with a significant reduction in his back and joint pain, the patient's swim times improved, raising him from 'average' in his age group to qualifying for the State Swim Team.

Conclusion: Existing research has indicated the cortical and muscle effects of chiropractic care, including shortening of the cortical silent period and increased bite force. This case report indicates that Chiropractic care may impact on human performance in a paediatric population. This is a standalone case report and further research is warranted.

Indexing Terms: Chiropractic; Subluxation; diversified technique; Activator Methods; Quality of Life; Swimming; Sports performance.

Introduction

Chiropractic care beyond musculoskeletal pain remains arguably the most promising area of emerging research. Adjusting and correcting the vertebral subluxation has led to discoveries regarding the brain and how it drives muscles.

At this point in time, research has been restricted to adult populations. This body of work includes a line of investigation into stroke patients. A 2022 study found that a single spinal adjustment increased cortical drive to the lower limb muscles. (1) This followed a 2019 study looking at maximum voluntary contractions in plantar flexor muscles in stroke victims after one session of chiropractic care. (2) The study revealed a significant increase in plantar muscle strength and V-wave amplitude.

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While the stroke rehabilitation population was recovering from an injury to the brain, other research looked at a sample group of athletes. The sample was drawn from a group of elite Taekwondo athletes, and the muscle examined was the *plantar flexor* muscle as in the 2019 stroke study. The study found that a single session of spinal manipulation produced a significant increase in muscle strength and corticospinal excitability. The muscle effect lasted 30 minutes and the corticospinal effect persisted for an hour. (3)

These studies emerged following seminal work by Haavik and Murphy in 2007 which examined somatosensory evoked potentials and found that cervical spinal manipulation altered sensorimotor integration. (4) This study suggested that Chiropractic care may alter (improve) cortical processing and sensorimotor integration. More recent studies have revealed that Chiropractic care shortens the cortical silent period, increases bite force, increases muscle strength and improves joint position sense. (5, 6, 7)

These studies in combination create a picture of the potential of Chiropractic to impact human performance via increasing sensorimotor integration, the amplitude of brain signals and the ability of the body to receive those signals. While there is a significant amount yet to be discovered in this line of research, the area of paediatric care and human performance remains a blank slate.

The following case report follows a paediatric case in which a patient presented for musculoskeletal complaints which were significantly reduced with Chiropractic care. At the same time, the patient was able to lift his swimming performance from 'average' to qualifying for the state swim team.

Case details

A 10-year-old male presented for Chiropractic care with primary complaints of lower back pain, right shoulder pain and some ankle pain. He was a novice to Chiropractic and seeking treatment for musculoskeletal pain. His ankle pain was thought to be due to his swim kick, as he was a high-level breaststroke and freestyle swimmer.

While musculoskeletal pain was his original concern and presentation, it was quickly established that his goals included being able to gain acceptance into the State Swim Team, despite his swim time not being competitive enough for inclusion in the squad.

At the first appointment the history and examination was performed during which it was revealed that he had undergone two previous surgeries for strep pneumonia in 2018 (five years prior). As part of his treatment, chest tubes were inserted into his left lung and he had been advised to start swimming in order to rehabilitate the lung. At the time of presentation, he was training five days per week.

Clinical findings

The patient underwent a standard battery of tests to determine the location and nature of his vertebral subluxations. These were in line with Diversified Technique and Activator Methods® protocols and revealed decreased range of motion in the lumbar, thoracic and cervical spine. Vertebral subluxations were noted at C1 right posterior, C4 left posterior, L5 right posterior and RAIS.

Postural analysis was undertaken using the Posture Screen Assessment tool. This revealed an increased forward head posture of 1.77cm (0.7") forward past the lateral posture line, equating to an equivalent head weight of 6.5kg (14.3lb) (up from 3.9kg, 8.6lb). The patient also showed hips and shoulders shifted backward (by 2.8° and 1.3°), and knees shifted forward by 3.3°, equating to total anterior to posterior shifts of 12.8°.

The patient had a left head tilt of 2.5° and a right shoulder shift of 1.5°. His hips were shifted to the right by 1.1cm (0.4”) While these were not significant shifts, the athletic interests of the patient made them an issue for consideration. The agreed aims of care were to improve swimming times by enhancing the function of the nervous system.

Management

Following this examination the patient commenced a course of Chiropractic care on a schedule of one visit per fortnight with reviews every twelve visits. While he stuck to this schedule, he also had extra adjustments post-swimming competitions. In addition to his vertebral subluxation findings and review scans, swim times were noted as a measure of physical performance.

As part of his care plan, he was adjusted using Activator Methods and Diversified Technique.

Outcomes

Alongside a marked decrease in his shoulder, ankle and low back pain and subluxation listings, the patient’s swim times improved significantly. At the beginning of his care plan, he was ‘average’ in his category.

At the conclusion of his care plan, his performance had lifted to the point where he was selected for the state swim team. This was due to significant decreases in his short-course swim times, and during which his long-distance swim times were also notably improved, with his 200m freestyle time improving by 29.2 seconds (nearly 10% off of his original time). His 200m breaststroke time was reduced by 12.7 seconds, which was a marked improvement on his original time.

His swim times are as follows.

	Baseline 26/11/2022	Adjustment 2 9/10/2023	Adjustment 3 4/11/2023	Adjustment 4 25/11/2023	Adjustment 5 16/12/2023	Adjustment 6 20/01/2024	Adjustment 7 17/2/24	Decrease
50M Freestyle		36.34	36.34	35.46	34	35:96	34.43	1.91
100M Freestyle			01:22.2	01:20.8		01:18.0		00:04.2
200M Freestyle	03:22.3	03:01.8		03:00.9		02:53.1		00:29.2
50M Breaststroke		47.22	45.04	44.96	42.83	44.76	42.03	5.19
100M Breaststroke		01:41.3	01:47.6			01:40.2	01:33.8	00:07.5
200M Breaststroke			03:40.9			03:28.2		00:12.7
100M Breaststroke		01:41.3	01:47.6			01:40.2	01:33.8	00:07.5
200M Breaststroke			03:40.9			03:28.2		00:12.7

At the time of writing, the patient and his parents had decided to maintain his care schedule as he was swimming 30 hours per week (minimum). The demands of his training regime on his

body, and the benefits experienced under care, meant that they felt keeping Chiropractic in his health plan at the frequency of once per fortnight was optimal.

Discussion

While some of this may have been attributed to a reduction in musculoskeletal pain, the above-mentioned research indicates that a reduction in subluxation may also have contributed. Either way, Chiropractic care was the single point of care and routine that changed. There were no additional changes to his training regime or care during that time. Additionally, given the first significant increase in swim times took place after the second adjustment (200m freestyle, 20.5 seconds), it is reasonable to say that the improvements spiked close to the beginning of the care plan and could not be attributed to time or training.

Human performance has not been studied in child or adolescent populations within the Chiropractic patient cohort yet, making this case report novel. With this said, it is reasonable to deduce that if Chiropractic care was shown to increase muscle strength and maximal contraction and decrease the cortical silent period in an adult population, this effect is also likely to take place in a paediatric population. The potential this has to impact both athlete and paediatric populations may be significant. Further research is required to confirm and explain this effect.

Conclusion

We, as Chiropractors, know that the potential of a person can be impacted by the presence of vertebral subluxations. The child's swimming times are a clear demonstration of the potential that can be achieved by having no interference on the nervous system.

At the time of publication, his swim times were still decreasing steadily. Therefore, we contend that Chiropractic care may have a significant impact on human performance as further evidence that the identification of vertebral subluxation and its subsequent adjustment may have a significant impact on a person's ability to express life and interact with it.

Ruth Postlethwaite
BBiomedSc
Writer, ASRF

Clare McIvor
BBus(Admin),
GD Comms(ProfWrit,Edit),
GD(Psych)(Cand)
Writer, ASRF

Jennifer Luu
BSc, BHSc(Chiropr) MChiropr
Private practice of Chiropractic
Melbourne
Australia
jen@knoxchiropractic.com.au

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References

1. Navid MS, Niazi IK, Lelic D, et al. chiropractic spinal adjustment increases the cortical drive to the lower limb muscle in chronic stroke patients. *Front Neurol*. 2022;12. [10.3389/fneur.2021.747261](https://doi.org/10.3389/fneur.2021.747261)
2. The effects of a single session of chiropractic care on strength, cortical drive, and spinal excitability in stroke patients. *Sci Rep*. 2019;9(1). [10.1038/s41598-019-39577-5](https://doi.org/10.1038/s41598-019-39577-5)
3. Christiansen TL, Niazi IK, Holt K, et al. The effects of a single session of spinal manipulation on strength and cortical drive in athletes. *Eur J Appl Physiol*. 2018;118(4):737-749. [10.1007/s00421-018-3799-x](https://doi.org/10.1007/s00421-018-3799-x)
4. Haavik-Taylor H, Murphy B. Cervical spine manipulation alters sensorimotor integration: A somatosensory evoked potential study. *Clin Neurophysiol*. 2007;118(2):391-402. [10.1016/j.clinph.2006.09.014](https://doi.org/10.1016/j.clinph.2006.09.014)
5. Haavik H, Murphy B. Subclinical neck pain and the effects of cervical manipulation on elbow joint position sense. *J Manipulative Physiol Ther*. 2011;34(2):88-97. [10.1016/j.jmpt.2010.12.009](https://doi.org/10.1016/j.jmpt.2010.12.009)
6. Haavik H, Ozyurt M, Niazi I, Holt K, Nedergaard R, Yilmaz G, Turker K (2018), "Chiropractic Manipulation Increases Maximal Bite Force in Healthy Individuals," *Brian Sciences*, 2018, 8, 76; [10.3390/brainsci8050076](https://doi.org/10.3390/brainsci8050076) <https://doi.org/10.3390/brainsci8050076>
7. Christiansen, T.; Niazi, I.; Holt, K.; et al. The effects of a single session of spinal manipulation on strength and cortical drive in athletes. *Eur J Appl Physiol*. 2018 Apr;118(4):737-49. <https://doi.org/10.1007/s00421-018-3799-x>
8. Haavik H, Niazi I, Jochumsen M, et al. (2018), "Chiropractic spinal manipulation alters TMS induced I-wave excitability and shortens the cortical silent period," *Journal of Electromyography and Kinesiology*, Volume 42 (2018), pp. 24-35. <https://doi.org/10.1016/j.jelekin.2018.06.010>

About the Chiropractor

Dr Jennifer Luu graduated from the Royal Melbourne Institute of Technology (RMIT) in 2012. She is passionate about being a servant to service, and as such, aims to be a positive influence on as many lives possible, so they, too, can be a positive influence on as many lives as possible.

She is involved with *To Love & Serve*, where she coordinates teams of chiropractic volunteers in Cambodia and creates products for the Chiropractic profession.

Dr Luu is the current Vice-President of the Australian Spinal Research Foundation, Board Director of the International Federation of Chiropractors & Organisations, and Vice-Chair of the Rotary Club of Scoresby-Caribbean-Gardens.

Since becoming a Board Governor with the ASRF, Dr Luu now heads up the Fundraising portfolio where she uses her extensive fundraising experience to assist the Foundation to raise important funds for research.

About the Case Report project

This Case Report is a part of the [ASRF Case Report Project](#), a project designed to gather client studies from chiropractors and transform them into much-needed case reports, focused on the effects of chiropractic care on clinical presentations highly relevant to chiropractic, such as stress, immunity and adaptability.

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