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Case Report

The clinical and subjective outcomes associated with spinal manipulation: A case study

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ABSTRACT

Spinal manipulation (SM) has been documented to have various physiological effects, of which the research literature has started to reflect over the past decade. This case study was designed with intent to further investigate these findings. A 31 year old woman with experience of lifting weights and working a very physical job presented with ipsilateral right-sided lower neck and shoulder pain (C7-T4, right trapezius, and right scapula area) and bilateral low back pain (L1-L5 and S.I joint area). Following the examination, a differential diagnosis list was decided on with the input of multiple doctors and therapists. The primary treatment was SM over a time span of 6 months. The patient displayed significant results. Objective testing through a follow-up range of motion (ROM) examination showed an increase in ROM and a spinal examination presented a reduction in local muscle tightness. In addition, subjectively, the patient reported a significant reduction in pain, an increase in movement confidence, and ability. The results of this case study suggest that SM in conjunction with patient education has a significant positive effect on the patient's reduction of pain, local muscle tightness and increase in ROM, and patient movement ability and confidence. Further studies are required to isolate the specific effects of SM in a high-powered study and clinical setting.

Keywords: Spinal manipulation, Chiropractic adjustment, Spine, Pain, Range of motion, Muscle, Education

INTRODUCTION

Spinal manipulation (SM) has been documented to have various physiological effects, of which the research literature has started to reflect over the past decade.^[1] Regardless of these efforts, there are still contrasting results being published and an absolute lack of evidence directly observing how SM impacts the performance of strength athletes. Williams (2022) performed a comprehensive literature review covering the clinical outcomes most evident from SM, and among these were (1) improved pain outcomes; (2) increased range of motion (ROM); (3) improved proprioception and balance/coordination; and (4) a decrease in local muscle tension and soft-tissue restrictions. This case study was designed with intent to further investigate these findings.^[2-9]

CASE REPORT

A 31 year old woman with experience of lifting weights and working a very physical job presented with ipsilateral right-sided lower neck and shoulder pain (C7-T4, R trap, and R scap

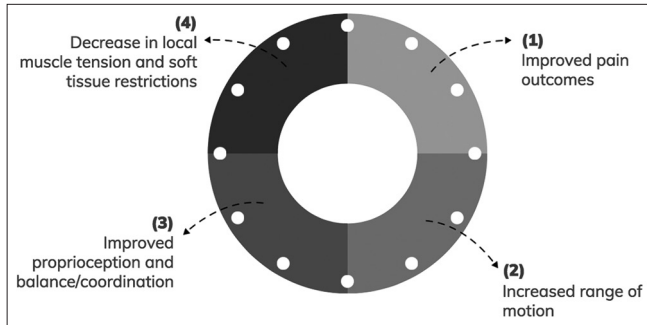


Figure 1: Spinal manipulation clinical outcomes (Williams, 2022a).

area). No rust's sign, minor's sign, or antalgic lean – postural assessment were mostly normal with a small elevation of the right shoulder and minor anterior head carriage. Weight and body mass index are WNL (within normal limits). Vitals such as temperature, heart rate, blood pressure, and respiratory rate were all within normal limits. She reported an achy/tight pain which gets worse throughout the day; 0/10 at best, 3/10 on average, and 7/10 at worst which often feels better with Panadol/rest and usually feels worst at the end of a long day at work – pain occurs 3–5 × per week and lasts for hours at a time until rest or medication is taken. Orthopedic tests were mostly normal apart from a positive O'Donoghue's test Part 1 and incidental muscle pain on convex side of the maximum cervical compression test and on the ipsilateral side of a shoulder depression test. ROM was all WNL with slight restriction on the right lateral flexion. No radiculopathy down the arm or any other radiating or referred pain was presented. On examination of the spine, she presented with computed tomography junction restriction, decreased JP, MP with some heat, point tenderness, and local muscle tension. CNs, myotomes, dermatomes, and DTRs are all WNL. Job includes asymmetric loading in awkward positions and she claims to notice a correlation between this and the pain.

Furthermore, the patient complained of bilateral low back pain. Pain was described as a dull ache/tightness that at best was 0/10, on average was 3/10, and at worst 6/10. Pain came on throughout the day and was at its worst after a long day's work or extended prolonged activity, rest made it better or light stretches. All myotomes, dermatomes, and DTRs were WNL and all orthopedic tests were negative apart from some incidental hamstring tightness on the SLR. ROM was mostly normal with some flexion restriction and tightness, no radiculopathy, or referred pain, however. The spinal examination revealed reduced R ilium JP and MP with bilateral hypertonic QLs and erector spinae. No specific areas of PT (point tenderness) but some increased heat over and around the lumbar spine bilaterally. Hip ROM was WNL. The patient regularly bends over and asymmetrically loads in flexion often at work, pain is exacerbated by being on her feet for long periods and bending over constantly on long shifts. The patient has no other health

conditions and consumed no anti-inflammatories or pain relief within this time – nor was any anti-inflammatory gel, or massage cream used that may have affected the results.

Differential diagnosis

Following the examination, an investigation was conducted by the lead researcher and a DDX list was decided on with the input of multiple doctor/therapists. The investigation involved the lead researcher narrowing down five key musculoskeletal conditions based on the participant's history, presentation, signs, and symptoms. This list was, then, discussed in depth alongside the case information with multiple other doctors and therapist. Based on the input received, the lead researcher reached a top three list of differential diagnoses.

The top DDX's are as follows

1. Muscular strain
2. Joint restriction (and/or vertebral subluxation)
3. Postural stress.

Treatment

The primary treatment was SM over a time span of 6 months. The upper back, T1-T4 was manipulated in various ways, including P-A, I-S, and distraction vectors. Education was provided on posture and shoulder positioning when lifting. Side posture manipulations were performed adjusting L1-L5 and the S.I joint, P-A drop table thrusts were also included in this treatment. Education was provided on how to hip hinge, which included proper movement through the hips, ways to bend over, and strategies on how to lift without pain.

Outcomes

The patient displayed encouraging results. Objective testing through a follow-up ROM examination showed an increase in ROM and a spinal examination presented a reduction in local muscle tightness. In addition, subjectively, the patient reported a rather large reduction in pain, an increase in movement confidence and ability [Figure 2].

DISCUSSION

The mechanisms discussed in Williams (2022) literature review provide a framework of which these results can be understood and replicated.^[2] It is important to understand that education around movement remains paramount and that is likely contributing to the success of this case study also.^[10] Nonetheless, it is evident that SM has a strong effect on the musculoskeletal system which is likely achieved through mechanical, biochemical, and neurological modulated processes.^[1] Although the results of this case study were encouraging, it is important to note that more

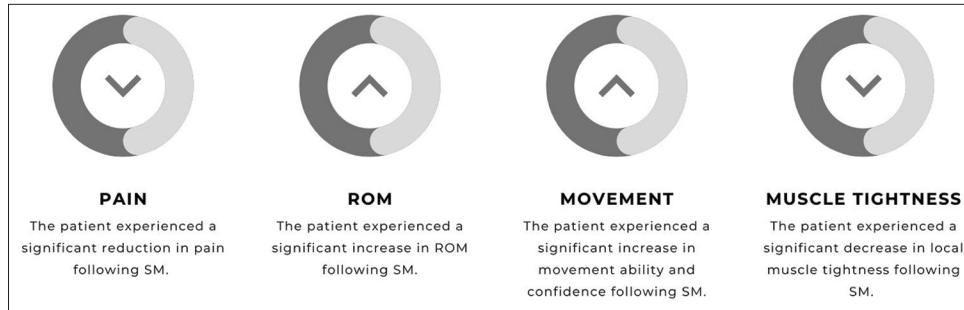


Figure 2: Reported outcomes (Williams, 2022a).

high-quality research is required to reach a stronger conclusion. Furthermore, it should be investigated whether the effects of SM are long term, which would require testing SM in isolation. This would most appropriately be done through a crossover, control group randomized clinical trial. The very nature of a randomized control trial provides more consistency with less room for biased outcomes. This case study provides a platform for more research to be done, which may benefit the overall medical system by providing more awareness and understanding around SM and the benefits it can provide at such a low cost and risk.

CONCLUSION

The results of this case study suggest that SM in conjunction with patient education may have a positive effect on the patient's reduction of pain, local muscle tightness, and increase in ROM and patient movement ability and confidence. Further studies are required to isolate the specific effects of SM in a high-powered study and clinical setting.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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