



EVIDENCE / RESEARCH / SCIENCE

## Chiropractic Adjustments Increase Muscle Function in Stroke Patients

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### WHAT YOU NEED TO KNOW

- Stroke patients are a subpopulation that can benefit from chiropractic services. Unfortunately, there are misconceptions about chiropractic and stroke.
- Stroke care has been relegated to rehabilitative approaches and has shown evidence to successfully promote motor control, but slowly.
- Chiropractic care appears to offer stroke patients an opportunity to maximize function, with a 64.2% increase in motor function; and perhaps avoid years of delayed improvements with rehabilitation alone.

Chiropractic care is too often “pigeonholed” into the realm of neck pain and back pain. There is an entire population of people with disparate maladies who can be helped with a chiropractic spinal adjustment, but are not considering chiropractic care as part of their treatment regimen.

Stroke: Misconceptions, Consequences ... and Opportunity

Stroke patients are a subpopulation that can benefit from chiropractic services. Unfortunately, there are misconceptions about chiropractic and stroke. The evidence in the literature has clearly shown that a chiropractic adjustment cannot cause a dissecting aneurysm (stroke).<sup>1-3</sup> Most stroke patients associated with chiropractic care are already undergoing a vascular incident, and either the chiropractor missed it during a clinical evaluation or it was not yet evident, which is in many cases.

Stroke is the leading cause of serious, long-term disability whose effects may be prolonged physical, psychological, emotional, social, financial, and other far-reaching negative sequelae. Every year, 17 million people worldwide suffer from a stroke, leaving 5,000,000 with permanent

disabling problems. It is estimated that 26% occur in those under 65 years old and 13 in 100,000 children suffer a stroke.<sup>4</sup> The economic burden for countries and the economic and stress burden for families is often devastating.

Clarke, et al., (2015) reported:<sup>4</sup>

"However, despite these advances, the longer-term outcome remains poor for many, with unmet needs common. Prevalence of depression is 31%, up to 40% of stroke survivors have loss of function of the upper limb at 1 year post-stroke, and 40% have problems with swallowing. A third of stroke survivors are aphasic, and ~15% are incontinent at 1 year. Deficits in memory, attention and concentration, perception, spatial awareness (neglect), apraxia, and executive functioning are consequences of stroke. Many stroke survivors require assistance from informal caregivers, often family members, for activities of daily living, including bathing, dressing, and toileting. This burden of care has an important effect on caregivers' physical and psychosocial well-being, with up to 48% of caregivers reporting health problems, two-thirds a decline in social life, and high self-reported levels of strain."

Stroke care has been relegated to rehabilitative approaches and has shown evidence to successfully promote motor control, but slowly. Holt, et al., (2019) reported:<sup>5</sup>

"Numerous rehabilitative approaches have been shown to promote motor recovery after a stroke. These include physical therapy, motor re-learning, and brain-computer interface-based approaches, amongst others. These approaches generally involve long-term treatment as a part of a large rehabilitation team. Advanced strategies are constantly being developed and tested in an attempt to improve long-term outcomes for stroke survivors. One possible intervention that may improve post-stroke motor recovery but has to date not been adequately tested is chiropractic care."

### Improving Muscle Strength Dramatically With One Adjustment

When considering neuromuscular changes, we look at the H reflex, which measures presynaptic inhibition and motor neuron excitability; and V wave measurements, which are changes in supraspinal input to the motor neuron pool. The first measures the immediate response of the chiropractic spinal adjustment, while the second measures the effect it has on the central nervous system.<sup>6-7</sup>

For people with subclinical spinal pain, a single session of chiropractic spinal adjustment significantly reduced the threshold for eliciting the H-reflex, increased the V-wave amplitude, and increased plantar flexor force by 16%. This was accompanied by a lack of fatigue associated with repeated maximal contractions done while recording the waves.

In comparison, participants in the control group became weaker and showed signs of fatigue. This indicates that the chiropractic spinal adjustment affects the H-reflex pathway and increases the cortical drive to muscles, preventing fatigue from developing during repeated maximum voluntary contractions. This enables the central nervous system to produce greater muscular force.<sup>8-9</sup>

This is part of the central segmental motor control affected by a chiropractic spinal adjustment. It occurs when a high-velocity, low-amplitude thrust affects the misplaced meniscoid and the facet, affecting the nociceptors on the facets, along with the mechanoreceptors, Golgi tendon apparatus, and nociceptors in the joint capsule; and "upregulates" neuropeptides that feed the dorsal root ganglion.<sup>10-12</sup>

As mentioned, the increased V-wave amplitude was correlated to an increase in plantar flexion force by 16% in respondents with subclinical spinal pain, which is significant. However, in stroke patients, with a single chiropractic adjustment, the increased average plantar flexion strength was 64.2%.<sup>13</sup>

Holt, et al., (2019) concluded:

"[C]hiropractic adjustments appear to alter the net excitability of low-threshold motor units and increase cortical drive, which may explain why the increase in strength that they observed occurred. They also suggested that chiropractic adjustments may prevent fatigue. Significant changes were also observed in strength and V-wave results. However, the changes in strength were far greater in the present study. The greater percentage increase in strength in the present study may be due to the stroke patients having weaker muscles to begin with, so they had more opportunity to increase in strength."<sup>14</sup>

### Clinical Takeaway

Chiropractic care appears to offer stroke patients an opportunity to maximize function, with a 64.2% increase in motor function; and perhaps avoid years of delayed improvements with rehabilitation alone. These findings are far-reaching and go well beyond stroke patients. This information, however, offers a neurological answer for improved motor function in the stroke population and beyond based on a chiropractic spinal adjustment.

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APRIL 2024