

What Happens to Reflexes after Spinal Manipulation?



For quite some time now, research has been revealing that chiropractic care (sometimes referred to as spinal manipulative therapy) can do something other than assist with back and neck pain. We've been thrilled and delighted as we've seen research emerge indicating that chiropractic care could increase strength in leg muscles, decrease fatigue, change the structure and function of the brain, increase bite force, and increase our awareness of where we are in space (a sense called proprioception) thus decreasing falls risk in older adults.

So, a recent study published in the *Journal of Manipulative and Physiological Therapeutics* that examined reflex responses to upper cervical and upper thoracic HVLA spinal manipulation in asymptomatic individuals was a welcome addition to chiropractic-relative literature. It showed that reflex responses post-spinal manipulation increased both locally (at the adjustment site) and nonlocally (in tissues and muscles not directly impacted by the adjustment). It is also congruent with other similar work which adds to the reliability of the study and the claims we can make because of it.

The study looked at HVLA spinal manipulation which is a high-velocity, low-amplitude thrust used by many chiropractors to adjust the spine. It is usually deployed in a strategic, as-gentle-as-possible fashion in order to correct subluxations. Other practitioners do occasionally use HVLA Spinal manipulation, but it is common to chiropractic.

The study in question was conducted in order to investigate the effect of spinal manipulation on reflex responses in multiple muscles – mainly in the limbs, neck, and back. Reflex responses are essential to human health. They are involuntary movements that act to protect us from danger or harm. These reflexes are controlled by neural circuits that meet in the spinal cord: that is, sensory information synapses (or joins) onto an interneuron in the spinal cord, which synapses onto a motor neuron that innervates the muscle.

These circuits do not require input from the brain, rather information about what has happened is relayed to the brain after the movement has happened. For example, you are only aware that you touched something hot *and* moved your hand after you have already done it. Increased reflexes may be linked to increased response times.

Hence, one could ask whether improved reflex responses are due to better nervous system conduction and communication in the body. Based on prior research, this could be a reasonable hypothesis.

What the Study Found

The study in question took 11 participants who all received the intervention. As it was an observational study, there was no control group. In order to be part of the study, participants had to be asymptomatic and had to meet certain inclusion criteria (i.e. no spinal manipulation in the previous month, no consumption of certain drugs, etc.).

The treatment, specific adjustments to the cervical and upper thoracic areas of the spine, was administered by a registered and practicing chiropractor with over 30-years' experience in administering manual spinal manipulative therapy. Each participant received 6 adjustments in a set order with a two-minute rest period between each thrust to reduce the potential interference (residual reflex activity) in recording the electromyography of the individual thrusts.

The electromyography (a way of measuring electrical activity in the muscles) was analysed for the presence of a reflex response, looking for specific peaks following each of the adjustments to obtain the results.

The study found that spinal manipulation increased reflex responses. Researchers found that cervical manipulation had the greatest rate of increase of reflex responses in the greatest number of muscles. They found that "the greatest number of reflex responses, 77%, occurred after manipulation of the C7 vertebrae."

"This trend was similar, although decreased in magnitude after thoracic SMT [spinal manipulative therapy]," remarked the authors. They went on to state that:

"Previous studies investigating reflex responses associated with SMT using both manual and instrument techniques at several sites along the spine have been conducted. Collectively, the results from these studies suggest that reflex responses after manual SMT are both local and nonlocal in addition to be reproducible both within and between participants. Nonlocal effects after manual SMT, that is, effects that occur in tissues not directly related to the target area, have also been reported elsewhere in literature."

This is encouraging, as it indicates a thread of research showing chiropractic care increases reflex responses (in terms of strength and response time), which further indicates that a well-tuned nervous system reacts as it should to stimuli. It's a key to human adaptability. It is also congruent with other similar research, which is important as science needs to be reproducible in order to be reliable.

As for why the effect was stronger in the cervical spine than in the thoracic spine, the answer could be relatively simple: that section of the spine has a higher density of specific receptors that control motor neurons at all levels of the spinal cord, resulting in the increased reflex responses both locally and non-locally.

Why Use an Asymptomatic Population?

The choice to use an asymptomatic population is perhaps unsurprising. If a symptomatic population were used, researchers may have to attribute the increased reflex response to the treatment of a condition. This would truncate the results.

This study was also mostly made up of chiropractic novices. Hence, they were not used to spinal manipulation or the HVLA thrust. The researchers did note this as a limitation, along with potential variations in the placement of electrodes however both of these factors were only minor in terms of their potential impact upon findings.

While the study didn't offer anything novel in terms of findings, it did serve to back up prior research linking Spinal Manipulative Therapy to an increase in reflex responses, thus adding to reliability of the research.

Chiropractors, if you are interested in reading the specifics of the study, including the percentage increases and the specific sites adjusted, the full study is referenced below [8].

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