

Can massage therapy support muscle regrowth? Translating bench science to massage and myotherapy practice

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Few massage and myotherapy therapists read or think much about bench research, especially considering that related clinical trials, observation studies, or even case reports are so much more applicable to practice. However, all massage and myotherapy therapists should be aware of recent animal research from the University of Kentucky in the United States and its potential implications for practice. ‘Enhanced skeletal muscle regrowth and remodelling in massaged and contralateral non-massaged hindlimb’ was published last year in *The Journal of Physiology* and examined the extent to which a massage mimetic could impact muscle regrowth after atrophy in massaged and non-massaged contralateral muscles.¹

Researchers used a computer-driven device to apply cyclic compressive loading (CCL)^{2,3} on an anaesthetised rat’s hind limb with atrophy. The rat was supported in a sling while its gastrocnemius muscle was rhythmically ‘massaged’ with a pneumatically driven wheel. Compressive (weight) and shear (angled glide) forces were controlled allowing a standardised treatment application. The study was a four-armed randomised control design with eight rats in each group (N=32): 1) Control, no induced atrophy, re-ambulation, or massage; 2) atrophy only; 3) atrophy and reambulation; 4) atrophy, reambulation, and 30-minutes of standardised CCL applied every other day over one gastrocnemius muscle (CCL started on the first day of reambulation).

Data analysis confirmed the existence of hindlimb muscle atrophy with muscle fibre cross sectional area decreasing 38 per cent on average through the inducement procedure (two weeks of hindlimb

This is the author’s version of the work published in final form as:

Munk, N. (2019). Can massage therapy support muscle regrowth? Translating bench science to massage and myotherapy practice. *Massage & Myotherapy Journal (Australia)*. 34-35.

suspension). The atrophy and reambulation rats (Group 3) had no significant muscle regrowth, however, rats in the CCL group (Group 4) had significantly larger muscle fibres compared to Groups 2 and 3 indicating the massage memitic when combined with reambulation enhanced muscle regrowth when directly applied to the atrophied muscle. This demonstration of muscle growth enhancement with a massage memitic in and of itself is meaningful but an additional finding is what makes this research particularly significant. Researchers also examined the non-massaged contralateral limb of the rats in Group 4 and found significant muscle size increase indicating a cross-over effect may have occurred. In other words, this research has demonstrated that an animal memitic for massage (CCL) can enhance muscle regrowth through direct application and contralaterally. The exact mechanisms of these outcomes are not currently known. The study's authors point to elevations in protein degradation (which enhances the identification and elimination of faulty or damaged proteins within a cell) and hypothesise increased myofibrillar and cytosolic protein synthesis to explain the increased muscle size for the rats who received the CCL in addition to reambulation.

The implications of this research are exciting even though the results must be considered with caution due to its conduct in animals and very controlled environment. Many people across the age spectrum experience muscle atrophy through functional decline, sedentariness, accident, illness, and immobility. While this research does not prove that massage or myotherapy reverses muscle atrophy or enhances muscle regrowth in humans, the results provide a growing evidence base to which massage and myotherapy clinicians can point supporting an assertion that provided treatment supports muscle health. The results also support the theoretical application of cross-over or Pflüger's Law of Symmetry^{4,5} for treatment; essentially when force is applied to one part of the body, a neurological impulse produces the same effect on corresponding muscle contralaterally. When faced with situations in which one side of the body is not directly available for treatment application (e.g., casts, wounds,

burns or other acute injury), clinicians should consider providing treatment on the opposite side of the body to address the inaccessible area.

It is easy for clinicians in any applied field to focus primarily on clinical trials or only on research in human populations due to the immediately derived clinical relevance of research results. However, massage and myotherapy clinicians are encouraged to consider relevant bench research when the opportunity arises and build mechanistic knowledge to help support clinical decision making and explain treatment outcomes experienced and demonstrated by their patients and clients.

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