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Opinion

The Myofascial System and Mind-Body Connections for Improving Health

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Myofascial System

Throughout the years, scientists dissected the human body to obtain knowledge of the body's structure and functions. During dissection, fascia is cast aside in receptacles and rarely studied. Fascia is the connective tissue that forms a web-like structure that covers, and connects every aspect of the body including bones, organs, muscles, nerves and blood vessels [1]. Although this structure is found vastly throughout the entire body, all of the functions of this tissue are still being studied. The myofascial system acts as an "exoskeleton" for the body and its inherent architecture is described by principles of biotensegrity. Tensegrity principles describe architectural structures that have continuous tension with discontinuous compression providing stability and flexibility of structures. Within the human body, concepts of biotensegrity link organizational structures at the molecular, cellular, tissue, organ and organ system levels [2]. Biotensegrity refines the explanation of the body's ability to adapt to change and the mechanics of movement by providing mobility, stability and function [3]. At the cellular level, microfilaments serve as the tension components (straightening) and microtubules function as compression (bending) components [4]. In addition, compression of the extracellular matrix transmits mechanical forces directly to the cell and nucleus through the architectural model. At the tissue level, integrins, extracellular matrix and the cytoskeleton, mediate mechanical signal transduction (mechano transduction) throughout the body [5].

Furthermore, the fascial system or "exoskeleton" provides compression-resistant or tension-generating components [2,6]. Fascia is composed of collagen fibers and ground substance, rich in proteoglycans, especially hyaluronic acid (HA). The HA acts as a lubricant so that fascia glides easily over muscle epimysium and acts as a shock absorber [7]. Fascia constantly transmits and receives mechano-metabolic information that can influence the shape and function of the entire body [3]. Following an injury or lack of exercise, the fascial system weakens, and HA becomes adhesive causing fascial restrictions. The fascial restrictions lead to changes in biotensegrity causing poor body alignment, decreased muscular strength and coordination. The compressive forces or lines of tension within the joint can lead to pain due to free nerve endings [7].

Mind-Body

Langevin HM [8] hypothesizes that unspecialized "loose" connective tissue, or fascia, functions as a body-wide signaling network. If the fascial network provides a communication system, could emotions use this same system to communicate? Pert [9] believed that the body is the unconscious mind and traumatic events are stored within the body. Emotions and bodily sensations are intricately intertwined through a bidirectional network. Memories are not only stored in the brain, but within the psychosomatic network of cells within the body. Pert [9], states, "The idea that the mind and body could be treated as a whole, that the emotions could be accessed through the body, not just the mind, for healing, and that the result could improve the health of the organism appealed to our deepest instincts."

Additionally, the belief that tissues could possess the ability to store information or "memories" is still controversial in manual

medicine. However, Tozzi P [10], explores the idea that every time a cell changes its shape, a vibratory message signals through the extracellular matrix forming a "body consciousness" connecting the nervous system. Furthermore, memories related to disease, physical or emotional trauma cause distorted vibrations, thereby altering the consciousness of memories stored in soft tissue [10].

Moreover, the idea of mind-body is not a new idea. Emerging disciplines such as psychoneuroimmunology (PNI) focus on the interactions between the endocrine, immune, and nervous systems and allow for a broader scope of how the mind and body interact [11]. Biopsychosocial factors, such as psychological stress, influence the immune system. Chronic stress leads to immune suppression, which is mediated by endocrine factors [12]. The connection of mind-body is even more apparent when studying Adverse Childhood Experiences (ACE). Research indicates that individuals with ACE's have significantly poorer health outcomes, health risk behaviors and socioeconomic challenges [13]. Complementary and alternative medicine begins to bridge this gap in healthcare.

Myofascial Release

Uniquely, myofascial release (MFR) is a type of manual therapy that requires a low load, long-duration stretch to restore optimal length, decrease pain and improve function. The low load and long duration hold used in MFR allows for plasticity versus elasticity changes in the tissue. Myofascial release restores hydration of the tissue and physical changes to the body's structure so that improved movement patterns can be appreciated. Changes to the biotensegrity of the body allow for decompression of structures in the body leading to reductions in pain. Structural changes that occur from MFR may provide an avenue for releasing such memories by unloading tissues that decrease neural input and the mechanical load of fascial structures [14]. Manual therapy may affect the changes in the viscosity of HA causing a reset of "dysfunctional memories" that were stored in the fascia [10]. Within the biotensegrity matrix system, the body's information is communicated through a harmonic wave motion through vibrational chemo mechanical energy [15].

In a case report published by Goyal M, et al. [16], the use of MFR and myofascial unwinding improved depression and quality of life in a 39-year-old homemaker. Myofascial unwinding is a somatoemotional release technique that stimulates the parasympathetic nervous system that leads to the release of tissue emotions (Henley, et al, 2008). The authors contribute the improved quality of life and depression scores in the patient due to release of ascial restrictions at the physical and the emotional levels. Hence, MFR provides a conduit to the mind-body connection at the unconscious level in addition to structural changes to improve biotensegrity.

Recommendations

Undoubtedly, the mind-body relationship is a powerful connection. Traditional therapy typically works in silos for the treatment of either physical or emotional but not both. Western medicine often treats one system or aspect at a time. Myofascial treatment has the possibility to the change physical properties of the body (biotensegrity) and facilitate emotional release for a more holistic approach. Working interprofessionally should be encouraged to treat the biopsychosocial factors associated with improved quality of life.

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Conflict of Interest

Author declares no conflict interest.

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