Dynamic Chiropractic

CHIROPRACTIC (GENERAL)

Physiology Does Interact with the Subluxation Complex

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Recently I was privileged to attend the most recent MPI Subluxation Complex seminar here in Toronto, Ontario. Drs. David Seaman and Keith Innes were seminar leaders. Dr. Innes would remember this, however Dr. Seaman was plagued on that day with the flu and might have a hazy memory of doing his seminar. (I thought he did a remarkable job considering his condition -- I'd love to see David on an "on" day.)

I was the lone observer-physiologist undertaking to re-learn some neurology, but more importantly, I was there to indelibly imprint the subluxation complex on my brain, in preparation for the upcoming MPI exercise physiology seminars.

Now, with David taking an extended lunch/recuperation break, I was called upon in the extra time available to say a few words. I introduced myself, my future seminars, and managed to -- off the top of my head -- phrase why exactly exercise physiology relates not only to the chiropractic profession but also to the subluxation complex.

Curiously, the first thing that came to mind up there in front of 70 glaze-eyed fourth-year chiropractic students and practitioners was why the increased respiration rate I was now experiencing (due to the psychological stress of the moment) was occurring and why I felt unusually warm ... Eureka! There's a connection. My personal interior biochemical milieu had been perturbed by my emotional responses, and the increased rate and depth of breathing (efferent activity from higher center) had interacted with my central nervous system, most probably impinging upon the dorsal horn at C-4 through 8 and T-1 through 7, causing the muscular vasodilatation I'm sensing as warmth. Wow. Right there, I am able to demonstrate to the students that by varying respiratory rate and depth, voluntarily or involuntarily, that the biochemical changes (and nociceptor stimuli) can indeed input onto the dorsal horn and affect the CNS and musculoskeletal system.

If this can indeed impinge on the dorsal horn, then I could most certainly demonstrate that by gross voluntary hyperventilation, I could drive off CO2 from the blood, raise the blood's pH (i.e., causing a respiratory alkalosis), and alter the biochemistry of the blood, and internally generate nociceptive stimuli at the dorsal horn. Thankfully, I decided just to describe the process instead. For that matter, the matrix of influences that the pulmonary system alone interacts with the CNS is far-reaching. Many factors impact directly with the medullary centers/nuclei responsible for regulating breathing and acid-base balance: Vagal afferents from pulmonary stretch receptors, and the efferent responses are regulated by epinephrine and steroid hormones; muscle stretch receptors; swallowing, coughing, sneezing, yawning; sleep excitation, singing, vocalizations; blood temperature; presso-receptors; cutaneous cold receptors. Blood pH and CO2 tension is sensed at the chemoreceptors in the medulla, and efferent responses to increase or decrease respiratory rate and depth will adjust the pH down to normal values. In severe cases of hyperventilation, a temporarily increased irritability of motor and sensory nerves occurs with reduction of ionized calcium ions in skeletal muscle, resulting in tonic contractions known as tetany. If respiration can

influence muscular contraction so profoundly, then certainly influences on the dorsal horn can affect much of our physiology!

The point here is that physiology does interact with the subluxation complex. When we exercise hard, or under/over breathe, we re-adjusting the interior chemical milieu. When we generate excess lactate during hard unaccustomed anaerobic exercise, the H+ liberated causes a fall in pH (until normal buffering by the bicarbonate occurs), which not only slows the glycolytic and oxidative process of ATP production, but is a nociceptive agent to the muscle and nerves. Conversely, it has been shown experimentally, that when the joints are passively or actively manipulated, proprioceptive afferents synapse in the dorsal horn, travel to the medulla, and interact with respiratory nuclei, causing altered breathing patterns.

So we are physiologically and chemically interconnected. Function affects structure. Structure affects function. Physiology impacts upon chiropractic.

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