Hemisphericity

By Edgar Romero, DC, DACNB

Hemisphericity is the term we use in functional neurology to describe differences in firing rates between the left and right sides of the brain. It is a term that is now found in the literature quite frequently, though the medical usage of hemisphericity is quite more limited than the chiropractic description of hemisphericity.

Without getting into the complex neurological pathways and cellular explanations that could explain the theoretical validation of the clinical results seen when a hemispheric model is applied, let’s take a brief glimpse into the hemispheric model and the potentially tremendous results we can achieve when focusing on this neurological approach.\(^1\) If you are at all curious as to these mechanisms and pathways, I wholeheartedly suggest checking out some of the seminars on the topic.

The hemispheric model theorizes that a side of the brain is not firing properly, generally having a different central integrative state from the other side. This is usually due to a physiological process involving a different firing rate of afferent bombardment, either from a joint position error (e.g., vertebral subluxation complex) or some other neurological lesion. Essentially, if one neurological system is not firing properly, then its post-synaptic neurological system will also not fire properly. If A cannot fire to B, and B fires to C, then C will have a decreased firing rate.

Chiropractors can most easily understand this through mechanoreceptor inhibition of pain at the spinal cord, which causes the cortical centers of pain to also fire less and decreases perception of pain. (The opposite is true, of course.)\(^2\) If we apply this same theoretical process to other brain centers, we can begin to see the vast scope of importance this could have when describing various structural and autonomic functions. More importantly, it can provide an explanation for some of the miracles chiropractors see every day in their offices with a myriad of disorders.

When we talk about the hemispheric model, it is inherent in the definition that there will be a lower performing cerebral cortex and a higher performing cerebral cortex. Generally, the left brain is more reality-based, whereas the right brain is more fantasy-based. The left brain tends to be the accelerator of the body, whereas the right brain tends to be the "brake" system. As gross as these generalizations may be, I use them every day in my practice.
When a patient comes in with ADHD or OCD, or any of the other disorders that are so commonly bandied about in recent times, my first inclination is to assess them for a right-brain hemisphericity. (Dr. Robert Melillo’s book *Disconnected Kids* explains this whole approach regarding children and the neurological approach to these disorders.) Put more simply, if the right brain is the "brakes" of the body and the brakes cannot be applied, we have, literally, a runaway nervous system with everything that would imply. Allergies, overactive immune activity, hypersensitivity reactions and emotional instabilities could all be, theoretically, linked to a right-brain hemisphericity.

Taking this further, a left-brain hemisphericity would mean a decreased "accelerator" neurologically, so we would think of conditions whereby the body or brain would not be stimulated enough. For example, if a patient is suffering from depression, I would look closely at the left-brain’s function.

Since the cortex itself is primarily inhibitory, if the cortex is not inhibiting the ponto-medullary brainstem, which in and of itself inhibits the IML (the interomedialateral nucleus, the primary nucleus of the sympathetic system), then we will see a phenomenon known as IML escape, in which we can go from primary parasympathetic function to primary sympathetic function, with the potential for a whole host of autonomic disorders. IML escape can cause the increased release of glucose and cortisol through adrenal mechanisms, necessitating the need for increased B vitamins as well as increasing general stress-related responses in the body, with all the ramifications that entails.

Since we are further increasing sympathetic firing, concomitant parasympathetic deficiency can cause intestinal disorders including GERD, ulcers and IBS, all of which could be classified as parasympathetic dysfunctions. Leaky gut syndrome, ulcerative colitis, Crohn’s disease and other autoimmune conditions may also respond to a hemispheric approach due to the modulation of the sympathetic system through the IML.

As I have written about previously, hemisphericity also tends to produce an ipsilateral "soft" pyramidal weakness (as well as a contralateral "hard" pyramidal weakness associated with stroke; a complexity that could be food for another article!), creating decreased tone of the extensor muscles above T6 and the flexor muscles below T6. This would lead to injuries we could classify as carpal tunnel syndrome, the misdiagnosis of a lumbar sciatica, foot drop and even tennis elbow; all because of the associated weaknesses seen secondary to a hemisphericity.
A justification for treatment for just about any disease process could be made through neurological pathways. For example, I tend to adjust all cardiac arrhythmia patients on the left side, since the SA node of the heart has neurological controls from the right cortex, and a right hemisphericity will allow escape to occur and a breakdown of cardiac rhythm. Adjust that same patient on their right side, however, and the response may not be as favorable.

The only way to truly know these pathways is to learn from people who have been studying them for years and can make sense of them all. In the meantime, start looking at the patient with a complete neurological approach and evaluation. Starting to connect neurological and functional states to specific hemisphericities will start to make this information more accessible and relevant, and your patients will benefit.

References

1. Much of this paper was adapted from Dr. John Donofrio’s presentation at the neurosegmental seminar sponsored by the Carrick Institute last July.

2. Read "Pain in the Brain" (Part 1 and Part 2) (March 25, 2008 and Sept. 23, 2008 issues of DC) to learn more.

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