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Sympathetic Nervous System Studied at Interprofessional Symposium

By Susan Vlasuk, DC,DACBR

The profound effects of sympathetic nervous system function on human physiology were emphasized at the most recent interprofessional symposium of the American Chiropractic College of Thermology (ACCT). The symposium, an annual event, was held in Monroeville, Pennsylvania on May 15-16, 1999, at the autonomic laboratory of Constance Haber, DC,DABCO.

The keynote speaker was John Ortolani,MD, a neurologist who operates a large multidocor center in Daytona Beach which specializes in rehabilitation protocols. He made an academic presentation on sympathetic nervous system anatomy and physiology, followed by a slide presentation on diagnostic imaging of sympathetic nervous system function via high-resolution infrared methodology.

In his practice, Dr. Ortolani utilizes infrared imaging in his diagnostic evaluations for reflex sympathetic dystrophy (now known as Complex Regional Pain Syndrome, Type I) and other syndromes involving chronic pain and neurologic dysfunction.

Providing a complementary presentation to Dr. Ortolani's lecture was Jacob Green,MD,PhD, who also utilizes infrared imaging in his neurology practice.

High resolution infrared imaging exquisitely visualizes the surface temperature changes that are under the control of the sympathetic nervous system. In his lecture, Dr. Ortolani pointed out that doctors in all specialties, including his own specialty of neurology, characteristically evaluate sensory and motor function quite well, but they do not evaluate the much larger sympathetic nervous system. Motor nerves can be evaluated via deep tendon reflexes and muscle strength testing, followed by electromyographic testing when necessary. Sensory nerves can be evaluated by the common light touch, pinprick, and position sense evaluative procedures, followed by sensory evoked potential examination when necessary.

Sympathetic nervous system evaluation, however, has traditionally been difficult in the typical clinical setting. The sympathetic nervous system, controlling vascular tonus, skin temperature, sweating and piloerection, has lent itself only to more obscure laboratory testing procedures such as electrical skin resistance and time-intensive thermometric testing of multiple discrete regions of skin temperature.

On the other hand, current generation high-resolution infrared scanners can evaluate large areas of skin temperature in a global fashion, providing anatomically recognizable images of remarkable clarity. Surface temperature is not only visualized, but accompanying highly sophisticated software provides statistical analysis, including image processing techniques developed for MRI, such as fast Fourier transformation, convolutions, and filters which allow visualization of deeper heat patterns not previously possible via earlier infrared equipment.

Current image processing techniques allow imaging of heat conducted from greater depths within the body by displaying and processing core metabolic heat conducted to the surface of the body over time. Therefore, physiologic function involving deeper body tissues is displayed, not only for diagnostic evaluation, but for followup evaluation as a monitor of response to treatment.

The importance of this to doctors in clinical practice who evaluate patients experiencing pain, is that pain is always accompanied by physiologic changes reflected in sympathetic nervous system function. There is a complex feedback mechanism between sensory nerves and the sympathetic nervous system. Motor nerves and sensory nerves may not be compromised sufficiently to evoke abnormal findings on a neurological examination, leading to the very common "negative examination" in a patient who is suffering from various kinds of pain.

Patients in pain find it very difficult and disappointing to be told that doctors can find nothing wrong with them. In many cases, however, these doctors have only examined two-thirds of the possibilities concerned with the nervous system, completely omitting evaluation of sympathetic nervous system function. Infrared imaging helps to fill that examination void, a void which is truly gaping, considering the profound effect that the sympathetic nervous system has in responding to pain states.

Technological innovations and advancements in infrared imaging were described at the symposium by Maurice Bales, president and chief technologist of Bales Scientific, Inc., in Walnut Creek, California. Even more startling to symposium attendees, however, was Mr. Bales' development and demonstration of a therapeutic infrared emitter designed to provide photonic stimulation to the sympathetic nervous system.

Photonic stimulation has recently come to the attention of the scientific community because certain energy wavelengths have been shown to have distinct physiologic effects on cells. The research, concentrating originally on various laser wavelengths, has more recently included infrared wavelengths, which appear to have an effect on polarization of nerve fibers. In a stunning implication for clinical patient management, the effect of photonic stimulation on sympathetic nervous system function was evaluated contemporaneously via high resolution infrared imaging as the treatment was actually being rendered. The photon stimulation produced obvious and immediate changes in sympathetic nervous system function as monitored via infrared imaging. Sites, duration and cessation of photon emission treatment were all determined via infrared imaging.

Dr. Haber, host of the symposium, organized a grand-rounds session for the symposium attendees in which multiple patients were presented who manifested either chronic pain or chronic neurologic dysfunction. All underwent infrared imaging. The relevant regions showing sympathetic nervous dysfunction (displayed by surface temperature abnormalities) were treated with photonic stimulation, which produced immediate physiologic changes in sympathetic function. Dr. Haber has been using photonic stimulation as guided via infrared imaging in her practice for two years. She has successfully treated an amazing array of chronic pain syndromes and other complex neurologic conditions, drawing patients from a great many states and from various provinces in Canada. Dr. Haber notes that her success is based not only on her training and experience, but on the current developments in infrared technology that have allowed her to monitor physiologic function of the sympathetic nervous system, thus guiding her management of these conditions.

Dr. Green, also participating in these grand rounds, presented his research on the use of photonic stimulation guided via infrared imaging in cases of diabetic neuropathy. He currently has four papers submitted for publication concerning the use of infrared imaging-guided photonic stimulation.

The ACCT is a subdivision of the Council on Diagnostic Imaging of the American Chiropractic Association. Its symposium is held annually for the purpose of providing current information germane to the field of infrared imaging, and also for providing continuing education for the doctors of chiropractic who are postgraduate certified in thermal imaging. Interested doctors are invited to attend next year's symposium.

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