

Diagnostic Tests used for Complex Regional Pain Syndrome (CRPS) (Abstract)

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There are many types of diagnostic tests used to help physicians diagnose patients suffering from complex regional pain syndrome (CRPS).

Some test can be more accurate than others. Some test used in the diagnosis of CRPS can be less accurate or non-diagnostic. In the case of tests that are, non-diagnostic, they should not be used in the diagnosis of the disease.

The tests usually applied for the diagnosis of CRPS consist of

- Nerve conduction velocity (NCV).
- Infrared thermal imaging (ITI)
- Scintigraphic triphasic bone scan (STBS).
- Quantitative sensory test (QST).

The use of nerve conduction velocity (NCV) test is usually non-diagnostic in CRPS (1). It shows normal or borderline velocity and distal delay of the sensory nerves. That does not mean that there is no nerve damage or dysfunction in CRPS I or CRPS II. The NCV test measures the conduction velocity of large nerve trunks such as median, ulnar, or perineal nerve. The nerve dysfunction in CRPS involves the thermal sensory microscopic nerves fibers in the wall of the blood vessels (2-5). Expecting such nerve damage to reflect the NCV test, is the same as expecting a virus to show itself on a regular microscope rather than an electron microscope.

Infrared thermal imaging (ITI), is a sensitive test for the diagnosis of neuropathic pain, especially CRPS, which can be quite helpful in the diagnosis of the disease. The use of ITI has been quite confusing to the physicians due to poor understanding of basic anatomy and physiology of the autonomic system, and because of the application of improper technology.

The poor understanding of thermal function has its roots in superficial, brief teaching in medical schools regarding the autonomic nervous system (ANS). Without proper teaching of anatomy and physiology of the ANS, the pathology will be hard to understand or treat, and the disease ends up becoming a diagnostic and therapeutic puzzle. The conventional studies of pain address the somatic type of pain at the expense of overlooking the neuropathic, (sympathetic) type of pain.

Scintigraphic triphasic bone scan (STBS) usually shows a lack of diagnostic sensitivity in CRPS patients as reported in the recent medical literature. According to Lee and Weeks, in their meta-analysis of this subject found the test to be positive in only 55% of the patients (6). Chelimsky, et al, found it to be positive in no more than 25% of the patients (7). For these reasons, it should not be considered a valid diagnostic test for CRPS.

Quantitative sensory test (QST) is sensitive and useful in studying the functions of c-thermoreceptors and A-beta mechanoreceptors in CRPS (8-11).

This test identifies the threshold of somatic(spinothalamic)cold or heat touch sensation-versus neuropathic (sympathetic) cold or heat pain sensation (11).

Conclusion

In CRPS, no laboratory test is diagnostic in 100 % of the CRPS patients. Concerning tests such as NCV which has a non-diagnostic value in CRPS and STBS which is only 55% accurate in the diagnosis of CRPS, other tests such as ITI and QST should be considered in helping the physician with the diagnosis of CRPS.

Regardless, clinically, and with the application of thermal tests such as ITI and QST, independently and objectively confirm the diagnosis of CRPS.

References

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