

[IMAGE]

Dynamic Chiropractic – April 6, 1998, Vol. 16, Issue 08

Spinal Algometry in Clinical Practice

By David R. Reich

The chiropractic profession, as a "hands-on" profession, relies heavily on palpation to provide clinical findings. Palpation can be used to locate and evaluate motion or position of a particular structure. Palpation is also a good way to determine if a particular structure is hypersensitive to digital pressure.

One drawback with palpation is that the examiner is unable to determine how much pressure is being applied. Terms like "mild," "moderate," or "strong" mean different things to different practitioners and patients.

An instrument which is very useful in quantifying pressure is the algometer, also known as the pain threshold meter. This is a hand-held force gauge, fitted with a stylus and covered by a 1cm² rubber tip. An analogue gauge is calibrated in kilograms/cm², with a minimum reading of 1kg/cm², and a maximum reading of 10kgs/cm².

The rubber tip is placed over the point being examined and pressure is applied. The patient is asked to tell the examiner when pain is induced. A reading is made and recorded, and the results become data to evaluate the patient.

There are many ways to evaluate the patient with an algometer. One method is to locate a region on the body which the patient complains is painful. The examiner palpates for a relatively tender spot and takes an algometric reading over that immediate area. Values and location are recorded in the records and rechecked immediately after the adjustment or at a later time.

Another use of the algometer is in the diagnosis of fibromyalgia syndrome. Eighteen specific points along the body are tested using a maximum of 4.0kg/cm² of force. If 11 or more of these points elicit a pain response, the diagnosis of fibromyalgia syndrome can be made.

The testing method I will be describing was developed as a full- spine procedure, testing regions of the spine, as opposed to one or more tender spots.

Procedure

Ask the patient to remove their shirt or blouse and put on a patient gown that is open in the back. A female patient may keep her brassiere on if the hooks are in the back; if not, it is advised that she remove it. Also ask the patient to loosen their pants or skirt, so that the skin in the region of the sacroiliac joints is exposed.

Show the patient the algometer and demonstrate how it works, with the patient's palm. Say something like, "This instrument is called an algometer. It is used to measure pressure or force. I am going to apply pressure to the inside of your palm, and I will stop once I reach 4 kilograms" (proceed to demonstrate). "Forty-three points along your spine and pelvis will be tested using this instrument. At first you will experience pressure, which may change suddenly and cause a mild sharp pain. I want you to let me know the moment you feel this pain by saying 'now.' I will stop the pressure, read the scale, and jot down the number in your records. Do you have any questions before I begin?"

The rule-of-thumb is to keep the algometer stylus perpendicular to the region being tested. Steady pressure is applied at an approximate rate of 0.5kg/second, and at a maximum force of 4 kgs. Place a thin strip of tape on the face of the algometer at the 4 kg mark to notify the examiner when to stop applying force.

Next, ask the patient to stand on the platform of the Hi-Lo table. I have found this to be the best position for cervical algometry, although the cervical spine can also be examined in the prone position with the headpiece put into moderate flexion.

There are four levels of the cervical spine which I evaluate: the region of the occiput/C1; C2/C3; C4/C5; and C6/C7. Since I work from the left, I prefer to begin the examination by testing the left side of the cervical spine, in the region of the articular facets. When testing the occiput/C1 region the algometer should have a slight superior incline and pressure should be applied to the suboccipital muscles near the lateral masses of C1. The C2/C3 test is held level, the C4/C5 has a slight inferior decline, and the C6/C7 has a more pronounced incline. The same procedure is then applied to the central spinous regions (post-tubercle of C1), and then to the right articular facet regions.

When the patient says "now" or gives some signal to stop, such as a "jump sign," read the algometer in 0.1 increments and record the results on a worksheet.

After testing the cervical spine, lower the Hi-Lo table and test the thoracic spine. Using a grease pencil, I mark the interspinous space of T1/2; T3/4; T5/6; T7/8; T9/10; T11/12; L1/L2; L3/L4; and L5/S1. In addition, I place a mark over the posterior-superior iliac spines (PSIS) bilaterally. I prefer to first test the left thoracic spine near the costo-transverse junctions, then the spinous regions, and then the right side. Care is taken to ensure the algometer is held perpendicular to the skin along the thoracic kyphosis.

It is advised that when examining the spinous regions of the thoracic and lumbar spines the algometer stylus be stabilized on the spinous processes using the indifferent hand. (The cervical spine is usually not a problem and does not have to be stabilized.) Stabilization prevents the algometer from slipping off the bony processes and irritating the patient.

After testing the thoracic and lumbar spines, I test a region slightly superior/medial, and then a region slightly inferior/medial along the sacroiliac articulation, near the grease-pencil mark on the PSIS.

Regional (as opposed to full spine) testing can also be performed using this method. Due to the fact that the neck in most people is relatively short (compared to the lumbar and thoracic spine), it is advisable to test every other segment and prevent overlap of tested regions. In the thoracic and lumbar spine, each individual segment can be tested; however, it is strongly advised that the skin be demarcated at each spinal level along the spinous processes.

The data from algometric testing can be taperecorded, or an assistant in the room can write down the information. You can also jot down the results yourself. Once you become proficient, all 43 points can be tested and documented in less than seven minutes without a recorder or an assistant.

I have developed a software program which generates a detailed narrative report using the raw data obtained from an algometric examination. With a little experience, the data can be evaluated and fed into the program in less than four minutes, including "touch-up" editing in the word processor. This can be done by an assistant as you interpret the data.

Evaluating the Data

The results of the algometric evaluation can be interpreted as follows:

- 1.0 to 1.6 = severe myofascial pain disorder
- 1.7 to 2.4 = marked myofascial pain disorder

- 2.5 to 3.2 = moderate myofascial pain disorder
- 3.3 to 3.9 = mild myofascial disorder
- 4.0 and up = normal

It is important to use common sense and get the complete picture when evaluating the data. If the majority of the readings are in the moderate range of a particular region, and one or two readings appear in the marked range, it would be reported as a moderate myofascial disorder. If the readings are approximately equal in severity between mild and moderate, the report would read mild to moderate myofascial pain disorder. If a region is for the most part mild, but there are one or two hot spots in which the reading may be in the marked or severe range, it would be reported as a mild myofascial pain disorder with increased sensitivity to pain in those particular regions.

I also compute the average values in each region for the patient, and use those values to document improvement or regression when compared to previous examinations. When using an average, it is advised that a value of 4.0 be given to those areas which do not elicit a pain response, and this number should be averaged with the other data.

If a person is asymptomatic in a particular region, and algometric evaluation reveals a myofascial pain disorder (and you don't suspect malingering), the patient may have a low threshold for pain; therefore, the upper limit may have to be lowered from 4.0 to 3.5, and the other regions' values extrapolated down accordingly. The same is true at the other extreme. If a patient feels no pain anywhere with a maximum force of 4 kgs/cm², and you have evaluated the region and believe that the pain is of musculoskeletal origin, you may need to increase the force to 4.5 and extrapolate up accordingly. The name of the game is to use common sense when evaluating the data.

Identifying the Malingerer

The needle on the analogue gauge of the algometer does not deflect until a minimum of 1 kg of force/cm² is applied. Hysteria, very low pain tolerance, psychological overlay, or malingering may be involved if the patient reports pain prior to the needle deflecting.

It is advisable to look for consistency of adjacent readings if malingering is suspected. Malingerers can be easily identified by repeating the test in the same region and looking for a significant deviation from the first trial (greater than 0.4 kg). In addition, there are usually small variations between adjacent readings in a

genuine patient. A malingerer's readings can be all over the place without rhyme or reason.

Conclusions

The algometer is a low-cost diagnostic instrument that is well-documented with reference to interexaminer reliability. The algometer has been used extensively in clinical pain research, and is very easy to use.

The initial reading should be performed within the first five visits, and should consist of a full spine evaluation. Re-evaluations can be full-spine or regional, based on clinical necessity. I recommend retesting your patient approximately every four weeks during active care and more frequently as MMI approaches.

Algometric testing can provide third parties with documentation that further proves care is or is not necessary. Algometry can be used toward the end of care to determine MMI (i.e.-if there are no significant changes in consecutive readings, and the patient's condition appears to be stable, the patient can be discharged from active care). I suggest doing regional studies toward the end of care when testing is more frequent.

The results of algometric testing can be used to alter your treatment protocols. For example, your chiropractic findings may indicate that the patient has made significant overall improvement, but the myofascial evaluation reveals little if any improvement. There is also the possibility that the readings appear worse, even though the patient feels better and your chiropractic findings show improvement. You may choose to alter or add adjunctive therapies, exercise, or nutritional support. Psychological overlays may also lower pain-threshold readings; the clinician should be made aware of these factors when evaluating a patient who is not responding symptomatically.

I find that the more I use the algometer, the more I learn. I find it to be an excellent tool for patient education. I can demonstrate and quantify the effects of subluxation on the myological component of the vertebral motor unit. Algometry can also be used as a post-check during routine office visits. In my experience, there is a dramatic improvement noted in algometric readings immediately following the adjustment.

This paper has been written in the hopes that other chiropractors can begin using algometry as part of their routine examination procedures. The spinal algometer is a simple, inexpensive diagnostic instrument to help assess the outcome of your treatment procedures.

David R. Reich, DC

Richmond Hill Chiropractic Offices

86-10 117th Street

Richmond Hill, NY 11418

Tel: (718) 857-5252

Fax: (718) 847-5303



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