Dynamic Chiropractic

MUSCULOSKELETAL PAIN

Manual Muscle Testing and Postural Imbalance

Kim Christensen, DC, DACRB, CCSP, CSCS

The best posture is one in which the body segments are balanced in the position of optimal alignment and maximum support, with full mobility available. Optimal posture allows for pain-free movement with a minimum of energy expenditure, and is a sign of vigor and harmonious control of the body.[1] One of the most useful diagnostic procedures in chiropractic practice is the manual testing of the muscles responsible for maintaining postural alignment. This part of an examination provides valuable clinical information, which can be correlated with a patient's history and reported symptoms.

Postural patterns are maintained by a complex arrangement of proprioceptive input, modified by habits, somatotype, and even psychogenic factors, such as self-esteem. Deviations from the ideal, efficient alignment eventually result in the production of chronic pain symptoms, which have been shown to be predictable.[2] chiropractic adjustments can improve the segmental misalignments, but comprehensive and effective treatment requires that the muscle imbalances be addressed.

Postural Muscles and Alignment Problems

Persistent faulty postural alignment is almost always associated with an imbalance in the surrounding musculature. Sustained misalignments result in some muscles becoming shortened and others developing a constant overstretch. And, of course when certain muscles are used more frequently (at work, or during sports), they get stronger and tighter, while the underutilized opposing muscles are, by comparison, weaker. The eventual consequence is a malposition of the involved joint(s). Trying to determine which came first - the alignment problem or the muscle imbalance - may in some instances matter, however both will generally need to be addressed. In fact, they are usually bound together into neurological habit patterns that are imperceptible and unnoticed by the patient. The doctor must identify the structures and the muscles that are involved, so that the patient can begin to work on a corrective exercise program.

Common Muscle Imbalances

Many of us develop a similar, almost standardized configuration of muscle imbalance. While there are many individual variations, due to work habits and sport activities, there is a consistent pattern that is primarily the result of the way we customarily use our postural muscles. There also seems to be a neurological developmental component, since these patterns are very common and widespread.[3]

Upper Body Patterns

The postural muscles of the neck, upper and middle back, and shoulder girdle demonstrate this type of configuration, as discussed. It is very common to find tightness and trigger points in the neck extensor muscles, the upper *trapezius*, and the levator *scapulae* muscles. The opposing groups (*longus colli* and *capitis* and lower *trapezius*) are frequently lax, and in need of strengthening. In the shoulder, the

muscles in the front (*pectoralis major* and *minor*) are usually tight and hypertonic, while the *infraspinatus*, *teres minor*, rhomboids, and thoracic erector *spinae* muscles are inhibited. These muscle imbalances develop into the very common postural pattern of forward shoulders and increased kyphosis, with a forward head and loss of the cervical lordosis.

Lower Body Patterns

Similar muscle imbalances are frequently found in the lumbar spine and pelvic region. The lumbar erector *spinae* muscles are often tight and hypertonic, while the abdominal muscles are lax. The hip flexor muscles get tight, while the *gluteus maximus* muscles become weak, thereby interfering with full hip extension during gait. This combination is suspected to be a contributing factor in hamstring muscle strains and tears.[4] Tight hip flexors will inhibit the hamstrings, which are under more stress during strenuous hip extension, since the glutei are not being much help. The result is excessive stress on the hamstrings, causing a sudden tear injury. Tight hip adductor muscles are frequently found in conjunction with weakness of the *gluteus medius* and *minimus* muscles; this can develop into a chronic groin strain.

Manual Testing Procedures

Standard methods of muscle testing are well described in the textbooks by Kendall and Kendall, and by Walther.*5* As is stated in Kendall and Kendall, "Muscle imbalance distorts alignment and sets the stage for undue stress and strain on joints, ligaments, and muscles. Manual muscle testing is the tool of choice to determine the extent of imbalance."*6* One important key to be aware of is recruitment, also called substitution. This occurs when a patient has a weakened muscle and tries to use another muscle to pass the test. If a patient changes the angle of the joint or tries to rush the test, a careful repositioning will usually uncover a weak muscle. This is the reason that manual muscle testing requires practice and experience for accuracy. Otherwise, a patient can fool the unsuspecting tester.

Carefully performed manual testing procedures can help to identify the specific muscle groups that are weaker, and those that have become shortened in an individual patient, so that general patterns do not have to be assumed. This permits the doctor of chiropractic to develop an individualized plan to reestablish muscle balance, by combining stretches for shortened muscles and strengthening and neurological stimulating exercises for the inhibited groups. In some cases, the muscle imbalance may be caused by a distant malfunction, such as when the psoas muscle is inhibited by excessive pronation.

Successful treatment programs include individually determined exercises to regain postural muscle balance. Exercises to avoid include those that increase the strength of the tight, strong muscles or that stretch out the weakened, inhibited muscle groups. If pelvic unleveling has been identified during postural evaluation, effective treatment requires careful examination of the structures from the ground upward. Most commonly, the lower extremities are not providing the necessary support for the pelvis. In many cases, custom-made orthotic support for foot pronation may be needed. Manual testing of the postural muscles can provide much of the information needed to plan supportive care as the spine is adjusted.

References

1. Panzer DM, et al. Postural complex. In: Gatterman MI. *Chiropractic Management of Spine Related Disorders*. Baltimore: Williams & Wilkins; 1990:256.

2. Griegel-Morris P et al. Incidence of common postural abnormalities in the cervical, shoulder, and thoracic regions and their association with pain in two age groups of healthy subjects. *Phys Ther* 1992; 72:425-431.

3. Lewit K. Chain reactions in the locomotor system: coactivation patterns based on developmental neurology. *J Orthop Med* 1999; 22:52-57.

4. Geraci MC. Rehabilitation of the hip, pelvis, and thigh. In: Kibler WB, ed. *Functional Rehabilitation of Sports and Musculoskeletal Injuries*. Gaithersburg;

5. Walther DS. *Applied Kinesiology, Vol. 1: Basic Procedures and Muscle Testing*. Pueblo: Systems DC; 1981.

6. Kendall FP, McCreary EK, Provance PG. Muscles: *Testing and Function* (4th ed.). Baltimore: Williams & Wilkins; 1993:270.

Kim Christensen,DC, DACRB,CCSP
Ridgefield, Washington

NOVEMBER 2000