A RELATIONSHIP BETWEEN HEADACHES AND LOW BACK PAIN AND DYSFUNCTION

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A correlation between low back pain and dysfunction and headaches has not been discussed in any depth in medical and rehabilitation literature. Hundreds of case studies provide evidence of a direct correlation between low back pain and headaches. This article will attempt to provide a cursory review of some structural and functional analyses of the bond between the low back and the head and neck which may promote further discussion on this topic.

Headaches and low back pain can be reviewed and analyzed as merely subjective complaints, which often don't reflect the true mechanical and, at times, organic etiologies. The authors suggest that the applied anatomic relationships between the cranium, spine, sacrum, pelvis and correlative structures are among the most common reasons people seek medical advice.

Almost 45 million people in the U.S. live with headaches. Apparently seven million people get debilitating headaches that last for hours at a time, at the frequency of once every two days. Popular estimates include a loss of 157 million workdays a year to headaches and the expenditure of two billion dollars a year for over-the-counter painkillers. Headache patients often require strong doses of medication to alleviate their pain. They use simple analgesics such as aspirin, Anacin (aspirin with caffeine), Tylenol (acetaminophen), and other combinations. They also use a wide range of prescription medications ranging from anti-migraine medication to nonsteroidal anti-inflammatory medication.

There are commonly described contributing factors to headaches, which include muscle tension of the facial, cranial, masticatory and neck musculature and impairment of circulation due to compromise of blood vessels by muscles in spasm, such as temporal artery compression under the temporalis muscle. Compression of the circulatory vessels at the craniocervical junction is also implicated in causalgia for headaches secondary to postural and soft tissue dysfunction.[1] Musculoskeletal dysfunction represents only part of the entire spectrum of possible etiologies of headaches and low back pain. Neurologic and endocrine system dysfunction must be assessed, and more, to cover all possible causes.

The craniosacral system is an integral anatomic component that needs evaluation when low back pain or headaches are presented symptoms. This system includes the dura mater, the membrane which envelopes the brain, spinal cord and spinal nerve roots. This dural membrane inserts into the sacrum and represents a key link as a sensitive structure that can mechanically generate head, neck or low back pain. The dura mater is a free and mobile membrane, except for its moorings at several locations on the bony axial skeleton. These attachments are situated within the vertebral bodies of C2 and C3, on the sacrum at the level of S2, at the joint between the sacrum and coccyx and on the coccyx.[2] The place of insertion of the dura mater on the second sacral vertebral segment has additional functional significance because it is also the center of gravity of the human body. Any pathologic tension on the dura mater may affect the connective tissue of this continuous membrane and its attachments, including that part of the membrane which envelops the brain, lines the inner skull, divides the right and left hemispheres (the falx cerebrum and the falx cerebellum), and divides the cerebrum from the cerebellum (the tentorium cerebellum).

At the caudal end of this dural link, the structural anatomy of the low back can be categorized into four specific and distinct segments: 1. the pelvis, 2. the sacrum, 3. the lumbosacral junction, and 4.

the lumbar spine. The pelvic joints, inclusive of the pubic symphysis and the iliosacral articulations, work concurrently, facilitating a “mobile stability” for standing balance, moving from sitting to standing, ambulation and stair climbing. Secondary to the functional nature of these joints, the repetitive movements affecting them, and the transcription of forces up the closed kinetic chains of the lower extremities through these joints,[3] biomechanical dysfunction is common at the pelvis.

We find that pelvic joint dysfunction manifests itself as structural and postural obliquities: the pelvis girdle appears elevated on one side when compared to the other side. Occasionally, the pelvic obliquities manifest as apparent leg length discrepancies. This means that these “pseudo” leg length differences are often secondary to neuromusculoskeletal dysfunction affecting the pelvic joints.

We have discerned that chronic pelvic girdle obliquities typically create far reaching mechanical and soft tissue dysfunction within the total body system. Because the pelvis represents the direct base of support for the spinal column, any asymmetry in static structure of dynamic function of the pelvis often gets relayed to the cranium via the postural adaptations of sidebending and rotation which occur in the lumbar, thoracic and cervical spine secondary to pelvic obliquities.

The head, which in essence is the open end of the spinal kinetic chain, must adapt itself in space according to the severity of the pelvic obliquity and the spinal postural adaptations. The head and neck righting responses and other neurological reflexes will facilitate a steady state of correction of the position of the head in space, regardless of the position of the pelvis and spine.

As these reflexes exert their influence on the head and neck in order to attain a more neutral position in space for the brain, the tissues and structures of the cervical joints, the craniocervical junction and the cranial sutures will be compromised. Some of the surrounding musculature will be required to sustain muscle contraction, as in protective muscle spasm, which the soft connective tissue, the fascia of the head and neck, will tighten and compromise the nerve endings and the circulatory vessels in the region.

A major contributory factor to low back dysfunction and headaches is biomechanical and soft tissue dysfunction of the sacral joint and surrounding musculature and fascia. The sacrum acts somewhat like a universal joint in a car. It is the center of gravity and, therefore, a center of stability, while simultaneously negotiating forces transcribed from above and from below. The sacrum’s “L” shaped (auricular) surfaces articulate with the ilia, forming the sacroiliac joints. The sacrum also forms joints with the fifth lumbar vertebra, the lumbosacral junction. These joints represent significant structural and functional units during bending, lifting, twisting, gait and other activities of daily living.

The sacroiliac joints appear to contribute significantly to the stability of the low back; the lumbosacral junction appears to contribute greatly to low back mobility. Although many educators, including Dr. Jacquelin Perry from Ranchos Los Amigo, in her most recently published book on gait analysis,[4] have described the reciprocal movement of gait to be the reciprocal movement of one arm together synchronously with the opposite leg. We contend that reciprocal movement is a phenomenon which occurs at the lumbosacral junction.

Reciprocal movement appears to be a neurologically-driven, reflexive-like mechanical movement which occurs during ambulation as the fifth lumbar vertebra rotates to the opposite side that the sacrum rotates (L5 rotation to the left as sacrum rotates to the right is palpable), and the arms and legs are a continuation of that proximally responding and reflex-oriented leg, arm and trunk phenomenon. The reciprocally occurring movement at the lumbosacral junction can be assessed easily on the sagittal plane as well.

During trunk flexion, when the fifth lumbar vertebra flexes and moves in an anterior direction, the sacral base moves in the opposite posterior direction. This movement pattern differentiates the lumbosacral junction, which is the articulation between L5 and the sacral base of sacrum (S1), from the other lumbar spine articulations between L1 and L5.
Manual therapists have found a high correlation with dysfunction of the sacroiliac joints, the lumbosacral junction and headaches. This association is so significant that headaches often subside in intensity and in frequency after successful treatment of low back dysfunction without any other intervention.

Statistics indicate that eight out of every ten Americans will suffer from some form of low back pain during their lifetime. Statistics also provide evidence that the area of most frequent dysfunction is between L5 and sacrum, assumed by the fact that the greatest number of patients are presenting with L5 discogenic signs and symptoms and 85% of patients undergoing spinal surgery for back problems have the surgery at the level of the lumbosacral junction. As the disc prolapses, the disc space narrows. The compression forces at the lumbosacral junction contribute significantly to similar compressive forces at the craniocervical junction. These compressive forces can potentially compromise the neurovascular tissues within the suboccipital space. Common sequelae of suboccipital compression are tension and vascular headaches. Decompression of the lumbosacral space often facilitates a decrease in the compressive forces at the suboccipital space, evidence provided by the increases in occipitoatlantal joint mobility and upper cervical ranges of motion.

Pain experienced in the head may be the result of sustained muscle contraction and joint hypomobility secondary to postural imbalances because of biomechanical dysfunction of the pelvic joints; the pain may be due to intracranial dural tension which is secondary to the sacral dysfunction, which is applying a pathologic force on the dura mater insertion. It may be due to compressive forces at the craniocervical junction which are compromising the neurovascular tissues in the suboccipital space which are secondary to the compressive forces at the lumbosacral junction.

Movement potential, whether minimal as at the cranial sutures and the sacroiliac joints, moderate as at the occipitoatlantal joints, and maximal as at the lumbosacral junction, needs to be maintained in appropriate rations. Joint mobility can lead to protective muscle spasm, limitations in accessory and physiologic ranges of motion, tissue tension and pain on palpation, spontaneous atrophy and degeneration of articular structures. Neuromusculoskeletal dysfunction of these key areas will lead to complaints of headaches.

There are manual therapy techniques which can effectively address the dysfunction in the low back, which will indirectly affect the joint mobility, tissue tension and ranges of motion of the cranial and cervical tissues and structures. Muscle energy technique, strain and counterstrain techniques, fascial release, craniosacral therapy and visceral manipulation, when integrated, can attain full and pain-free mobility of the lower spinal kinetic chain, which affect the severity and the frequency of headaches.

References

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