

Neck Pain & Benefits of Osteopathic Treatment

Cervical pain, otherwise known as neck pain, is very common in today's society, sending many people seeking medical treatment. Manual Osteopathy can be of great benefit to neck pain sufferers. This paper will focus mostly on soft tissue neck pain and will outline some background information about the differences in types of neck pain and treatment options, specifically osteopathic treatment.

Neck pain is common in people of all ages and can have many causes across a spectrum of acute and chronic pain. Some of the more prevalent causes are muscular tension and trigger points, degenerating disc disease, herniated discs, pinched nerves, osteoarthritis, and whiplash. Neck pain can also come from common infections, such as a viral infection of the throat, or from more rare infections such as osteomyelitis or meningitis, as well as multiple other causes not mentioned here.

Causes

Working all day bent over a computer, repetitive strain at work, driving long distances, poor posture while standing or sitting, stress and tiredness are all factors that can cause the muscles of the neck to become tight and the joints to become stiff. This can lead to muscular tension and myofascial trigger points which not only cause neck pain but can also cause radiating pain and/or parasthesia up the neck or down the arms to the hand and fingers and can also be a common cause of headaches. Most episodes of acute neck pain are due to muscle strain or a ligament sprain. This type of injury can be caused by a sudden force or trauma such as whiplash or a sporting injury, or from straining the neck, which can be caused simply by sleeping in the wrong position, leading to torticollis, or can also be caused from carrying heavy objects.

As we age, the water and protein content of the cartilage of the body changes. This results in weaker, more fragile intervertebral discs. Because both the discs and facet joints of the spine are partly composed of cartilage, these areas are subject to wear and tear over time. The gradual deterioration of these discs is referred to as degenerative disc disease, or DDD. Degenerating disc disease is often characterized by a low level of chronic pain that sometimes "flares" and gets worse, generally made worse by certain positions or activities. It can also be accompanied by arm pain. Degeneration of the tissue of the disc can make the disc more susceptible to herniation.

The intervertebral discs are pads that serve as "cushions" between the vertebral bodies of the spine, minimizing the impact of movement on the spinal column. Abnormal rupture of the central portion of the disc is known as a disc herniation. If the herniation is large enough, the disc tissue can press on the adjacent spinal nerves. Symptoms vary from no symptoms, to local pain only, to pain with nerve referral or parasthesia in the distribution of the nerve being

impinged. Herniated discs are generally caused by an injury to the spine, such as a sports injury, an automobile accident or improper lifting of heavy objects.

A pinched nerve happens when pressure on a peripheral nerve irritates the nerve itself, its protective covering, known as the myelin sheath, or both. When this occurs the nerve is unable to conduct impulses properly, leading to sensations of pain or parasthesia. When this happens in the neck it is known as a cervical radiculopathy. Common causes include bulging or herniated discs, cervical arthritis, poor posture and repetitive activities.

Cervical spondylosis is also known as osteoarthritis of the neck. It is caused by the wear and tear of the joints and bones in the neck and occurs naturally as we age. It does not always cause symptoms, although in some people the bone changes can cause neck stiffness and muscle tension of the neck and into the shoulder. The nearby nerves can also be affected and cause pain and parasthesia in that nerve distribution. When pain is present, it is generally worse in the morning and at the end of the day, with the person achieving relief throughout the day when the neck is being moved around more.

Whiplash is an acceleration-deceleration neck injury caused by a sudden movement of the head forwards, backwards or sideways. It often occurs after a sudden impact, such as a road traffic accident. The vigorous movement of the head overstretches and damages the tendons and ligaments in the neck. As well as pain and stiffness, whiplash can cause tenderness in the neck muscles, reduced and painful neck movements and headaches.

Anatomy

The neck anatomy is a well-engineered structure of bones, nerves, muscles, ligaments and tendons. Although it is a delicate structure housing the spinal cord, it is remarkably strong and flexible, allowing movement in all directions. The neck begins at the base of the skull and through a series of seven vertebral segments connects to the thoracic spine. With its complex and intricate construction, the many stresses and forces that can be placed on it through trauma or just regular daily activities, make the cervical spine at risk for developing the painful conditions mentioned above.

The neck maintains several crucial roles, including: **1.** Housing and protecting the spinal cord- The spinal cord is a bundle of nerves that extends from the brain and runs through the cervical and thoracic spine prior to ending just before the lumbar spine. It relays messages from the brain to the rest of the body and from the body back to the brain. **2.** Supporting the head and its movement- The head weighs on average between 10 and 13 pounds. In addition to supporting the head, the neck allows for the head's flexibility, including rotation, flexion/extension, and lateral flexion motions. **3.** Facilitating blood flow to the brain- Vertebral openings in the cervical spine provide a passageway for vertebral arteries to pass and ensure proper blood flow to the brain. These openings are found only in the cervical spine.

The bones of the spine, called vertebrae, are each named by its position in order from superior, C1, to inferior, C7. The C1 vertebrae, which holds up the skull, is specially named the atlas, after the mythological titan Atlas who similarly held the earth on his shoulders. The articulation formed between the atlas and the skull is known as the atlantooccipital joint.

Similar to C1, the C2 vertebrae is specially named the axis. The axis has a very distinct shape due to the presence of the odontoid process, a tooth-like prominence that extends from its body superiorly toward the axis. The odontoid process serves as the axis upon which the atlas rotates at the atlantoaxial joint. Each vertebrae consists of a thin ring of bone, or vertebral arch, surrounding the vertebral and transverse foramina. The vertebral foramen is a large opening in the centre of the vertebra that provides passage for the spinal cord and its meninges through the neck. Flanking the vertebral foramen on each side are the much smaller transverse foramina. The transverse foramina surround the vertebral arteries and veins, which, along with the carotid arteries and jugular veins, have the vital job of carrying blood to and from the brain. Extending from the vertebral arch are several bony processes that are involved in muscle attachment and movement of the neck. The spinous process extends from the posterior end of the arch and serves as a connection point for the muscles that extend the neck. On the left and right lateral side of each vertebra is a transverse process that forms the insertion point for the muscles that flex and extend the neck. A thickened region of bone known as the body lies anterior to the vertebral foramen and forms the main bone mass in all cervical vertebrae except for the atlas. The bodies strengthen the vertebrae and support most of the weight of the head and neck. The intervertebral discs made of rubbery fibrocartilage lie between the vertebral bodies. Lateral to the vertebral bodies are flattened facets that form joints with the neighboring vertebrae and skull, allowing movement among the vertebrae.

The motions of the neck are flexion, extension, lateral flexion and rotation. The motion of bending the head forward is called flexion and this action is caused by the longus colli and capitus, scalenes and sternocleidomastoid(SCM) muscles. The scalene and SCM muscles are located on both the right and left sides of the neck, both sides must work together to produce the flexion action, while the longus colli and capitus lie on the anterior portion of the neck. Moving the head in a backwards direction is known as extension. The muscles causing this action are splenius capitus, semispinalis capitus, the suboccipital group, and upper trapezius. These muscles are all located bilaterally on both sides of the spine. Tilting or leaning the head and neck to one side is called lateral flexion. This action is caused by the scalene muscle group. Even though the scalenes are located on both sides of the neck, only the muscles on the side of the neck being bent are used. The fourth type of movement of the neck is rotation, the act of turning the head to one side. This motion is produced by the splenius capitus, SCM, levator scapulae and suboccipital muscles. Again, all are located on both sides of the spine but only the muscles on the side being rotated towards are working.

Assessment

To determine possible causes of neck pain, practitioners will go through a series of assessments that may point to muscular, ligament, nerve, or bony causes.

Neck evaluation would start with having the client move their head and neck through the active ranges of motion of the neck. Normal cervical ranges of motion for the average adult are 40-60 degrees of flexion, done by having them try to touch their chin to their chest. 40-70 degrees of extension, having the client try to look up at the ceiling. 60-80 degrees of rotation, turning the head as far as possible to each side trying to look over the shoulder. And 45 degrees of lateral flexion, having the client lean the ear down towards the same side shoulder.

When limited active range of motion is present in any range, the practitioner will move on to passive range of motion by manually moving the person's head and neck through the limited ranges. Generally when there is pain present during active range of motion but the pain goes away with passive range of motion the cause is muscular. However, if the pain is still present with passive range of motion the cause is more likely to be of ligament, nerve or bony origin.

If muscular cause has been ruled out, and is thought to be of nerve root origin, there are comparison charts available to relate the affected muscles to their corresponding nerve root to be looked into further.

Once range of motion testing is completed, the practitioner may move on to orthopedic tests to look at more specific conditions. This will help to rule out and/or confirm certain conditions. Some of these may include O'Donohue's Test which differentiates between ligament pain and muscular pain in the back of the neck, Valsalva's Test which can indicate a herniated cervical disc, and Spurling's Test which assesses facet joint pain and nerve root irritation. Some others include Cervical Spine Distraction Test, which differentiates between radicular pain in the back of the neck, shoulder and arm and ligament or muscular pain in these regions, and Jackson's compression test, which assess the presence of nerve root irritation.

When a condition of the neck is thought to be of non-soft tissue cause the person may be sent for imaging to help with a diagnosis. Generally starting with an x-ray of the spine, which may be followed by a CT scan or MRI if more precise imaging is required.

Common Treatment

Since most everyday neck pain is due to the muscles, ligament or joints of the spine, most pain may last from just a few days to a few weeks and can be treated quite easily at home, not requiring surgery. The acute stage is classified from onset for the first seven days. It is generally best to rest for the first 24-72 hours and apply a combination of cold and heat therapy as well as anti-inflammatory medication as needed. The main focus in the acute phase is reducing any inflammation and decreasing any swelling present to help begin the healing process. Therapeutic treatment is also helpful from the onset of the pain, whether it be manual osteopathy, physiotherapy, massage therapy or chiropractic care. As the injury progresses into the subacute stage, classified as longer than one week but less than three months, the patient may try to return to as many normal activities of daily living as possible while still using heat and cold therapy as needed and introducing some stretching and strengthening exercises. Any treatment modalities being used by a practitioner will be increased in intensity during this phase. The aim in the subacute stage is to continue to decrease and hopefully eliminate any inflammation still present and augment the tissues in repairing themselves so as not to develop scar tissue, calcification, muscle contractures or more permanent joint stiffness. If an injury moves into a chronic phase, being present for more than three months, the focus is still placed on reducing pain and improving function so the patient can continue on with normal activities. However, chronic pain may be limiting to a person's movements, often causing reduced flexibility, strength and stamina. This difficulty carrying out important and enjoyable activities can lead to further disability and despair.

Osteopathic Treatment

Manual osteopathy is a hands-on system of diagnosis and treatment, designed to improve health and resolve symptoms by aligning the structures of the body and facilitating mobility. Circulation in the body (blood, lymphatics, CSF and the nervous system) is thereby improved, and this enhances the body's ability to maintain its own health. As the structure of the body improves, so does its function. The main types of manual osteopathic treatment that would be beneficial to neck pain are Muscle Energy Technique, joint manipulation, and soft tissue therapy.

Muscle Energy Technique (MET) is defined as a system of diagnosis and treatment in which the patient voluntarily moves the body as specifically directed by the practitioner; this directed patient action is from a precisely controlled position, against a defined resistance by the practitioner. The practitioner positions the patient so as to engage the restrictive barrier of the muscle being focused on by placing that particular muscle into a stretched position stopping at the first barrier of resistance. The patient then would contract that muscle against the practitioners resistance for a period of five seconds, followed by a two second rest period with that muscle back in its neutral position. The muscle is again stretched to the point where it engages its barrier, ideally farther into a stretch than the first time. The patient once again contracts the muscle against the practitioners resistance for five seconds, followed by a two second rest. The cycle is repeated once more through with an ideal final stretch with the muscle achieving greater length than at the beginning. This technique is greatly beneficial to helping to decrease tension, relax and lengthen the tense muscles of the neck and upper shoulder when there is dysfunction occurring at the cervical level. This in turn allows for increased range of motion of the spinal joints without the restriction of the hypertonic muscles.

Osteopathic joint mobilizations, also known articulatory technique or low velocity, high amplitude technique involves taking a joint through its complete range of motion in a fairly slow but controlled manner. It is aimed at restoring joint mobility and reducing soft tissue tension around the joint being 'articulated'. In addition, it promotes drainage of soft tissues and thus reduces inflammation. Joint mobilizations can be done on every single joint in the body but in the case of neck pain, focus would be placed on mobilizing the intervertebral joints of the spine. This aims to increase proper movement of the spinal column, increase joint health and help decrease muscle tension in the surrounding muscles.

Soft tissue therapy, also known as myofascial technique generally focuses on the musculature and fascia of the body. It is defined as a direct technique, which usually involves lateral stretching, linear stretching, deep pressure, traction and/or separation of muscle origin and insertion while monitoring tissue response and motion change by palpation. Soft tissue techniques may be the only techniques needed in a treatment session or sometimes they are used as preparation or in combination with other techniques. Like MET, soft tissue therapy would aim to decrease the tension in the affected neck muscles while promoting blood circulation to the affected areas to augment in the healing process.

Other important components to osteopathic care are the clinical advice and homecare the practitioner has to offer the patient. This is very likely to include a stretching and strengthening exercise regime to help return the affected portion of the body to working order and therefore help prevent re-injury, advice on proper nutrition for the whole body to keep the body running as a well oiled mechanism, and helpful tips to prevent injury in the future.

Conclusion

Due to the prevalence of pain, specifically neck pain, that is present around us all the time, whether it be due to work, leisure, injury, or anything in between, manual osteopathy is an extremely beneficial treatment option for the entire population, young or old. All of its components hold benefits for the entire body and focuses on healing the structure to therefore heal the function, giving many people the chance for an improved quality of life.

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Benefits of Manual Osteopathy for Neck Pain Sufferers.

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