

## My Hunch Is ... It's Kyphosis

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Sitting at our computers, being on our phones, watching Netflix movies and having another excuse to not exercise can take its toll on our posture, back pain and activities of daily life. A forward head position, rounded shoulders, rounded back and weakness of muscles are the effects of poor posture, being sedentary, or unresolved physical trauma.

Pain and injuries can occur when the arm rotates too far inward (excessive internal rotation) and is one of the most common musculoskeletal imbalances of the thoracic spine and shoulder girdle (Price & Bratcher 2010). Excessive internal arm rotation is dictated by the position of the thoracic spine and shoulder blades (Kendall et al. 2005). Specifically, when the thoracic spine rounds forward in excessive thoracic kyphosis, the shoulder blades are protracted and elevated on the rib cage. Scapulothoracic dysfunction is when a tight scapula does not slide along the thorax. This means there is decreased motions of the scapula including elevation, depression, abduction and adduction. Additionally, there could be decreased upward and downward rotation with motions at the sternoclavicular and acromioclavicular joints. These faulty mechanics, or injury to the soft tissue may alter the relationship of the humerus in the suprahumeral space as the arm is abducted, leading to microtrauma within the joint, also known as impingement syndrome in the soft tissue of the suprahumeral space. Ouch! Other causes of muscle dysfunction in the thoracic spine and shoulder include arthritis, poor posture, scar tissue, psychological stress, breathing problems that affect the position and function of the rib cage and musculoskeletal imbalances in other areas of the body. (Clark & Lucett 2011; Petty & Moore 2002; Price and Bratcher 2010).

### **Posture Matters**

Let's discuss what improved, proper posture can do, and which Corrective Exercises to implement to stretch and strengthen to make functional gains and decreased pain.

Normal posture is defined as the vertical alignment between the midline of the shoulder and the mastoid process (Kendall et al 2005). When the acromion processes are more anteriorly positioned compared with the mastoid processes, a condition known as forward shoulder posture (FSP) occurs. This condition is characterized by protracted, internally rotated, anteriorly tilted, elevated and abducted scapula along with winging of scapula.

FSP can be attributed to repetitive overhead activities, bad habits, carrying heavy backpacks, computer use and prolonged study hours. FSP can lead to muscle imbalance in the form of shortening of the pectoralis major and minor, serratus anterior and upper trapezius. Additionally, the middle and lower trapezius muscles and rhomboids are lengthened. This muscle imbalance can lead to alteration in the scapular and glenohumeral orientation, thus increasing the risk of developing neck, shoulder and non specific arm pain. Borstad reported that reduced pectoralis minor muscle length would alter the scapular kinematics, which can predispose a personal to subacromial impingement syndrome. Stretching the pectoralis major and minor muscles can open up the chest. Strengthening lower trapezius, rhomboids and latissimus dorsi can help with improved posture.

Forward head posture (FHP) can be attributed to computer use, carrying heavy backpacks, excessive use of smartphones, bad habits or shoulder overuse. FHP has been associated with shortened levator

scapulae, sternocleidomastoids, upper trapezius, and posterior cervical spine muscles. Normally, the cervical spine is lordotic. Other than flexion and extension movements of the neck that take place in the sagittal plane, protraction and retraction movements also come into play in this plane. Protraction movement is a result of extension of the upper cervical spine and flexion of the lower cervical spine, whereas retraction movement results from flexion of the upper cervical spine and extension of the lower cervical spine. If the cervical spine is held in protracted position for prolonged duration, it can lead to alterations in head posture ultimately leading to poor posture known as forward head posture (FHP), which is thought to be a deviation from neutral or normal posture. The literature contains scientific evidence that increased cervical lordosis can lead to more pronounced thoracic kyphosis. (Deepika et al 2017). Stretching the levators and performing chin retractions to neutral can help to align the cervical spine in a neutral position.

Thoracic kyphosis has been thought to be one of the most frequently seen abnormalities in patients with lumbar lordosis, low back pain and osteoporosis as well as in postmenopausal women. Thoracic kyphosis is the technical term for the common “hunchback” position, where your upper back is excessively rounded. The pectoralis minor and major, upper abdominals and anterior intercostal muscles are shortened when thoracic kyphosis exists.

Although there is a consensus among researchers on the co-existence of FSP and FHP and increased thoracic kyphosis, doubt remains about one being the cause or the consequence of the other.

### **Addressing and Correcting Musculoskeletal Imbalances with Corrective Exercise**

Corrective exercises can start with self-myofascial release of all major muscles in the thoracic spine and shoulder girdle: rhomboids, trapezius, latissimus dorsi, pectorals, rotator cuff group, spinal erectors and abdominals. Self-myofascial release will improve circulation, decrease adhesions, loosen scar tissue, eliminate excessive tension and release endorphins to help break the pain cycle (Inkster 2015; Price 2013).

The next step is to stretch tight muscles and mimic ADLs such as reaching up to a shelf, pushing up from sit to stand, or donning clothing.

Here are a few ideas:

- Shoulder rolls backward loosens the shoulders and neck, the scapula, and joints between the ribs and spine and sternum. Start with 10;
- A chest opener stretch is to squeeze shoulder blades together behind the back, keeping shoulders relaxed. Hold for :20;
- A pec stretch opens the chest, mobilizes the rib joints at the sternum and strengthens the large muscles of the back. While standing, interlace fingers behind your back, palms up. Keep chin tucked in neutral. Slowly straighten arms and gently lift to a comfortable stretch of the pecs. Brace with abdominals to avoid arching the spine. Hold for :20;
- To stretch the thoracic spine, stand with feet hip width apart and extend arms back while pushing sternum forward. Hold for :20.
- Repeat all above 2-3 times.

Once the release and the stretch have been performed successfully, strengthening exercises can begin.

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