

Neck Pain and Hamstring Tightness: A Less Known Connection

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Neck pain is the 4th highest reason for disability among adults. The adult population showed a prevalence of 5.9% to 38.9%. Females are more frequently affected than males.¹ Mostly, the patients with neck pain seek consultations in health care settings for their neck pain associated issues and the health care provider avails the best available evidence to make decision regarding treatment. The decision making for assessment and treatment of neck pain in clinical settings can be complex for health care providers when it is accompanied by hamstring tightness. This feature can put the health care provider at risk of avoiding connection of neck pain and hamstring tightness. Hamstring tightness influences the posture of the pelvic region which contributes to the symptoms like inappropriate lumbar pelvic region movements and low back pain. This distortion in the lumbar pelvic region can also cause limitation in a variety of cervical movements and can cause neck pain.² The fact is because one neural system connects the hamstrings and those muscles around the neck. That neural system passes through the dura and is known as the superficial back line (SBL).²

The Superficial Back Line (SBL) connects and protects from the base of the lower limbs to the top of the head on the posterior surface of the human body. The function of the SBL is to support the body in the upright position and to prevent forward bending.³ The fascia consists of myofascial chains that encompassed the SBL from the plantar fascia to neck muscles along with the erector spinea, sacrotuberous ligament, hamstrings,

gastrocnemius, and achilles tendon.³ The Figure-1 shows the concept of SBL with direction in red line connecting the back of human body between the neck and the base of heel.



Figure 1: Concept of superficial back line.

The flexion of upper limb increases movement of same side erector spinea, gluteal region till hamstring and muscles of foot. The SBL eases effective force transmission between the extremities and trunk due to its anatomical integration.⁴ Furthermore, it allows movements of upper limbs in combination with the trunk and the lower limbs during different functional activities like walking, sit to stand etc.³ The amount of force created by the cells of SBL is quite sufficient to influence the movement of musculoskeletal structures throughout the human body. Although the presence of myofibroblasts signifies a believable explanation for stiffness changes in tissues, it most likely is not the single cause. A systematic review

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suggests good evidence for the presence of myofascial chains which consists of plantar fascia, gastrocnemius, hamstrings, erector spinae muscles throughout the spine. Therefore, evidence of superficial backline association with hamstring tightness can be presented with neck pain.⁵



Figure 2: Hamstring flexibility allowing floor touch.

A clinical example regarding SBL is when treatment of the plantar fascia results in increased hamstring flexibility and hip range of motion. The Figure-2 shows the composite movement of floor touch, hamstring flexibility allowing touching the floor. This fact elaborates the implication of SBL that makes an impact on the flexibility of muscles.⁶ Meanwhile, it has been stated that the application of intervention on neck muscles can improve the flexibility of hamstring muscle with improved neck symptoms.³ Effectiveness of suboccipital muscle (muscle around the neck) inhibition technique, and self-myofascial release technique on hamstring flexibility has been recognized. The application of both techniques acknowledged, being effective with the direction of that when the tensed suboccipital muscles relax, the tone of the hamstrings muscle also decreases. This is because of the myofascial relaxation, where it revealed an association between a symptom of neck and hamstring.¹

The implication of SBL is also supported by the evidence found in a randomized clinical trial that the application of static stretching and remote myofascial release on plantar fascia and muscles around the neck has been seen to be beneficial to improve the flexibility of hamstring muscle. However, it was further found that combined effects of both have additional effects.⁶ In another randomized control trial, the suboccipital muscle inhibition technique and craniocervical flexion exercises have

been shown to improve the hamstring flexibility along with the increased popliteal angle, craniovertebral angle, and cervical range of motion. This evidence enlightens the implication of SBL as connection of suboccipital area with hamstring activity.⁴ A randomized clinical trial conducted to found remote effects of the instrument-assisted soft tissue mobilization of hamstring. It was found that the instrument-assisted soft tissue mobilization on the upper and lower part of the SBL can improve hamstring flexibility significantly leading to improved composite functions.³ These all facts suggest the validity of hamstring association in neck symptoms and enlightens the clinical application of SBL.

Hence, the recent clinical trials showed significant results in their mean indicating the important association of hamstring tightness and neck pain. It is important to acknowledge this relation in neck-related symptoms during examination and treatment of a patient's neck pain that would decrease the frequency of clinical consultancy. There is a need for further research for an implication of its clinical practice among patients with neck pain.

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References

1. Popescu A, Lee H. Neck Pain and Lower Back Pain. *Med Clin North Am* 2020; 104(2): 279-92.
2. Cho SH, Kim SH, Park DJ. The comparison of the immediate effects of application of the suboccipital muscle inhibition and self-myofascial release techniques in the suboccipital region on short hamstring. *J Phys Ther Sci* 2015; 27(1): 195-7.
3. Fousekis K, Eid K, Tafa E, Gkriklas P, Mylonas K, Angelopoulos P, Koumoundourou D, Billis V, Tsepis E. Can the application of the Ergon® IASTM treatment on remote parts of the superficial back myofascial line be equally effective with the local application for the improvement of the hamstrings' flexibility? A randomized control study. *J Phys Ther Sci* 2019; 31(7): 508-11.
4. Jeong ED, Kim CY, Kim SM, Lee SJ, Kim HD. Short-term effects of the suboccipital muscle inhibition technique and cranio-cervical flexion exercise on hamstring flexibility, cranio-vertebral angle, and range of motion of the cervical spine in subjects with neck pain: A randomized controlled trial. *J Back Musculoskeletal Rehabil* 2018; 31(6): 1025-34.
5. Krause F, Wilke J, Vogt L, Banzer W. Intermuscular force transmission along myofascial chains: a systematic review. *J Anat* 2016; 228(6): 910-8.
6. Joshi DG, Balthillaya G, Prabhu A. Effect of remote myofascial release on hamstring flexibility in asymptomatic individuals - A randomized clinical trial. *J Bodyw Mov Ther* 2018; 22(3): 832-7.