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Review Article

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BECAUTIOUS: CHRONIC NECK PAIN MAY PREDISPOSE RESPIRATORY DYSFUNCTION AND DYSPHAGIA

[1]*V. Rajalaxmi and [2]G. Yuvarani

[1]Vice Principal, Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai.
[2]Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai.

***Corresponding Author: V. Rajalaxmi**

Vice Principal, Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai.

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ABSTRACT

This article aims to review various published articles whether neck pain has any relationship with dysphagia and respiratory dysfunction. various indexed article searches were conducted to initially screen the articles for neck pain and then added dysphagia and respiratory dysfunction as a second level search. neck pain is usually associated with protective spasm combined with tightness of the neck muscles which is also an accessory muscle of respiration leading to reduced lung volumes and capacities and the tightness of long flexors of the neck leads to swallowing difficulty.

Neck pain is a major public health problem which has a great effect on both the individual and society in terms of Pain, suffering and lost work days. It's one of the leading causes of years lived with disability worldwide.[1] Recent report by the global burden of disease, where 291 conditions were studied, neck pain ranked 21st in terms of overall burden and fourth when measured by years lived with disability (Hoy et al., 2014). Neck pain is musculoskeletal problem with tremendous impact on health and quality of life of the individual which includes costly treatment and on society as a whole. Previous researches showed that neck pain can cause decreased strength of deep neck flexors and extensors[2,7], hyperactivity and increased fatigability of superficial neck flexors (especially sternocleidomastoids and anterior scalene)[8,12], limitation of range of motion[13,17], increased forward head position (FHP)[18,21], decrease in proprioception and neuromuscular disturbances[22,23], existence of pain, and psychosocial dysfunction.[24,28] Chest expansion was the only significant predictor for Maximum Voluntary Ventilation determined by neck muscle endurance, which suggest that chronic neck pain patients should improve the endurance of the neck flexor muscles and thoracic spine and chest mobility. Combination of neck muscle exercise along with respiratory muscle endurance training result in increase in chest mobility and maximal expiratory pressure (Pemax).[29] Recent studies concludes that maximal voluntary ventilation, strength of respiratory muscles, chest mechanics and partial pressure of arterial carbon dioxide are affected in patients with chronic neck pain.[30] Neck muscle strength was the only predictor that shows significance in the prediction models of Maximum Inspiratory Pressure and Maximum Expiratory Pressure. It can be concluded that patients with chronic neck pain present weakness of their respiratory muscles. This weakness seems to be a result of the impaired global stabilizers and local stabilising muscle system in neck pain patients, and psychological states also appear to have an additional contribution. Clinicians are advised to consider the respiratory system of patients with chronic neck pain during their usual assessment and appropriately address their problems in treating them.[31] Maximum Voluntary Ventilation, Peak inspiratory maximum and Peak expiratory maximum were reduced in the patients with neck pain on par with controls. The authors concluded weakness of the inspiratory and expiratory muscles, implying a connection between neck pathology and respiratory muscles.[32] Respiratory exercise contributes to increase in respiratory muscle endurance and reduces neck pain in patient suffering from Chronic Neck Pain.[33] one of a current study demonstrated a strong association between an increased forward head posture and decreased respiratory muscle strength in neck patients. The connection of neck pain and respiratory function should be given at most importance in patient assessment, rehabilitation and consumption of pharmacological agents.[34]

Respiratory Muscle Endurance Training emerged from this pilot study as a feasible and effective method to rehabilitate chronic neck pain.[35] Patients with chronic neck pain do not have optimal pulmonary function. Cervical spine muscle dysfunction in parallel with pain intensity and kinesiophobia are factors that are associated mainly with this respiratory dysfunction.[36] Abdominal and chest breathing was assessed by observation showed that 83% of patients with neck pain, in a population of different chronic musculoskeletal pain syndromes, experienced a changed breathing pattern indicating a

relationship between neck pain and respiration.[37] An increased forward head posture was strongly associated with decreased respiratory muscle strength in patients. "The connection of neck pain and respiratory function could have a great impact on various clinical aspects, notably patient assessment, rehabilitation, and consumption of pharmacological agents," Dr. Kapreli said in an interview with Reuters Health. "In terms of assessment, all the different components of respiratory function should be included, aiming to gather a representative wholesome perspective of patients' problems.

The deep flexors and extensors of the cervical spine, although they do not play a direct role in respiration, are important dynamic elements for correct posture, muscle balance and segmental stability which is Known as 'active ligaments'.[38] These muscles could have an impact on kinetic control, not only on the specific area but also on articulations related to it such as in the shoulder or thoracic spine.[39] Although sternocleidomastoids and scalene used to be considered as accessory respiratory muscles, their respiratory role has recently proved to be essential[40] influencing dorsoventral rib diameter and lung volume.[41] In the case of increased fatigability in neck pain patients, muscles could either influence the respiration directly (especially inspiration) or indirectly, due to alterations in the functional length and recruitment, causing a change in rib cage mechanics. These elements provide an explanation for limited respiratory strength in chronic neck patients described through a biomechanical model.

Hence to conclude whenever there is a neck pain it is associated with decrease ROM, decrease in strength of deep neck flexors and extensors, hyperactivity and increase fatigability of sternocleidomastoid, upper trapezius and decrease in proprioception which leads to muscle imbalance causing postural abnormality, forward head posture and alteration the craniocervical angle sometimes dysphagia because of the tightness of the neck muscle leading to swallowing difficulties. Physiologically during breathing the chest wall expands tri dimensionally and this mobility is decreased by the decrease in strength and endurance of accessory muscles of respiration resulting in decreased chest wall mobility and lung volumes and capacities resulting in respiratory dysfunctions.

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REFERENCES

1. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. Lancet, 2012; 380(9859): 2163.
2. Watson D, Trott P. Cervical headache: an investigation of natural head posture and upper cervical flexor muscle performance. Cephalalgia, 1993; 13: 272–84.
3. Jull G, Barrett C, Magee R, Ho P. Further clinical clarifi- cation of the muscle dysfunction in cervical headache. Cephalalgia, 1999; 19: 179–85.
4. Placzek J, Pagett B, Roubal P, Jones B, McMichael H, Rozanski E et al. The influence of the cervical spine on chronic headache in women: a pilot study. J Manipulative Physiol Ther., 1999; 7: 33–9.
5. Ljungquist T, Fransson B, Harms-Ringdahl K, Bjornham A, Nygren A. A physiotherapy test package for assessing back and neck dysfunction—discriminative ability for patients versus healthy control subjects. Physiother Res Int., 1999; 4: 123–40.
6. Kumar S, Narayan Y, Prasad N, Shuaib A, Siddiqi ZA. Cervical electromyogram profile differences between patients of neck pain and control. Spine, 2007; 32: E246– 53.
7. Dumas JP, Arsenault AB, Boudreau G, Magnoux E, Lepage Y, Bellavance A et al. Physical impairments in cervicogenic headache: traumatic vs. non-traumatic onset. Cephalalgia, 2001; 21: 884–93.
8. Gogia P, Sabbahi M. Electromyographic analysis of neck muscle fatigue in patients with osteoarthritis of the cervical spine. Spine, 1994; 19: 502–6.
9. Falla D, Rainoldi A, Merletti R, Jull G. Myoelectric manifestations of sternocleidomastoid and anterior scalene muscle fatigue in chronic neck pain patients. Clin Neurophysiol, 2003; 114: 488–95.
10. Falla D, Farina D, Graven-Nielsen T. Experimental muscle pain results in reorganization of coordination among trapezius muscle subdivisions during repetitive shoulder flexion. Exp Brain Res., 2007; 178: 385–93.
11. Uhlig Y, Weber BR, Grob D, Muntener M. Fiber composition and fiber transformations in neck muscles of patients with dysfunction of the cervical spine. J Orthop Res., 1995; 13: 240–9.
12. Falla D, Rainoldi A, Jull G, Stavrou G, Tsao H. Lack of correlation between sternocleidomastoid and scalene muscle fatigability and duration of symptoms in chronic neck pain patients. Neurophysiol Clin., 2004; 34: 159–65.
13. Vogt L, Segieth C, Banzer W, Himmelreich H. Movement behaviour in patients with chronic neck pain. Physiother Res Int., 2007; 12: 206–12.
14. Osterbauer PJ, Long K, Ribaudo TA, Petermann EA, Fuhr AW, Bigos SJ et al. Three-dimensional head kinematics and cervical range of motion in the diagnosis of patients with neck trauma. J Manipulative Physiol Ther., 1996; 19: 231–7.
15. Feipel V, Rondelet B, Le Pallec J-P, Rooze M. Normal global motion of the cervical spine: an electrogoniometer study. Clinical Biomechanics, 1999; 14: 462–70.

16. Dall'Alba PT, Sterling MM, Treleaven JM, Edwards SL, Jull GA. Cervical range of motion discriminates between asymptomatic persons and those with whiplash. Spine, 2001; 26: 2090–4.
17. Ohberg F, Grip H, Wiklund U, Sterner Y, Karlsson JS, Gerdle B. Chronic whiplash associated disorders and neck movement measurements: an instantaneous helical 708 E Kapreli et al. © Blackwell Publishing Ltd Cephalalgia, 2009; 29: 701–710 axis approach. IEEE Trans Inf Technol Biomed, 2003; 7: 274–82.
18. Fernandez-de-las-Penas C, Alonso-Blanco C, Cuadrado ML, Pareja JA. Forward head posture and neck mobility in chronic tension-type headache: a blinded, controlled study. Cephalalgia, 2006; 26: 314–9.
19. Fernandez-de-las-Penas C, Perez-de-Heredia M, MoleroSanchez A, Miangolarra-Page JC. Performance of the craniocervical flexion test, forward head posture, and headache clinical parameters in patients with chronic tension-type headache: a pilot study. J Orthop Sports Phys Ther, 2007; 37: 33–9.
20. Edmondston SJ, Chan HY, Ngai GC, Warren ML, Williams JM, Glennon S et al. Postural neck pain: an investigation of habitual sitting posture, perception of 'good' posture and cervicothoracic kinaesthesia. Man Ther., 2007; 12: 363–71.
21. Yip CH, Chiu TT, Poon AT. The relationship between head posture and severity and disability of patients with neck pain. Man Ther., 2008; 13: 148–54.
22. Loudon J, Ruhl M, Field E. Ability to reproduce head position after whiplash injury. Spine, 1997; 22: 865–8.
23. Lee HY, Wang JD, Yao G, Wang SF. Association between cervicocephalic kinesthetic sensibility and frequency of subclinical neck pain. Man Ther., 2008; 13: 419–25.
24. Nicholas MK. Mental disorders in people with chronic pain: an international perspective. Pain, 2007; 129: 231–2.
25. Demyttenaere K, Bruffaerts R, Lee S, Posada-Villa J, Kovess V, Angermeyer MC et al. Mental disorders among persons with chronic back or neck pain: results from the World Mental Health Surveys. Pain, 2007; 129: 332–42.
26. Grip H, Sundelin G, Gerdle B, Karlsson JS. Variations in the axis of motion during head repositioning—a comparison of subjects with whiplash-associated disorders or non-specific neck pain and healthy controls. Clin Biomech (Bristol, Avon), 2007; 22: 865–73.
27. Fishbain DA, Cutler RB, Cole B, Lewis J, Smets E, Rosomoff HL et al. Are patients with chronic low back pain or chronic neck pain fatigued? Pain Med., 2004; 5: 187–95.
28. Wilhelm FH, Gevirtz R, Roth WT. Respiratory dysregulation in anxiety, functional cardiac, and pain disorders. Assessment, phenomenology, and treatment. Behav Modif, 2001; 25: 513–45.
29. B.Wirth, M.Amstalden, M.Perk, U.Boutellier, B.K.Humphreys, Respiratory dysfunction in patients with chronic neck pain – Influence of thoracic spine and chest mobility, Manual Therapy, October 2014; 19(5): 440-444.
30. Zacharias Dimitriadis, Eleni Kapreli, Nikolaos Strimpakos, Jacqueline Oldham, Respiratory dysfunction in patients with chronic neck pain: What is the current evidence? Journal of Bodywork and Movement Therapies, October 2016; 20(4): 704-714.
31. Zacharias Dimitriadis[ab] Eleni Kapreli[a] Nikolaos Strimpakos[ab] Jacqueline Oldham, Respiratory weakness in patients with chronic neck pain Manual Therapy, June 2013; 18(3): 248-253.
32. *Kapreli E et al. Respiratory dysfunction in chronic neck pain patients: A pilot study. Cephalalgia, 2009 Jul; 29: 701.*
33. *Vikram Mohan Nabilah Bt Ahmad Norain Bt Tambi, Effect of respiratory exercises on neck pain patients: A pilot study, Polish Annals of Medicine, February 2016; 23(1): 15-20.*
34. E Kapreli, E Vourazanis, E Billis, JA Oldham, N Strimpakos, Respiratory dysfunction in chronic neck pain patients. A pilot study, Cephalalgia An international journal of headache, July 2009; 29: 701–710.
35. B. Wirtha,c,∗, T. Duarte Ferreirab, M. Mittelholzerb, B.K. Humphreysc and U. Boutellierb, Respiratory muscle endurance training reduces chronic neck pain: A pilot study, Journal of Back and Musculoskeletal Rehabilitation, 2016; 29: 825–834.
36. Zacharias Dimitriadis, Eleni Kapreli, Nikolaos Strimpakos and Jacqueline Oldham, Pulmonary Function of Patients with Chronic Neck Pain: A Spirometry Study, Respiratory Care, April 2014; 59(4): 543-549; DOI: https://doi.org/10.4187/respcare.01828
37. Perri MA, Halford E. Pain and faulty breathing: a pilot study. J Bodywork Mov Ther., 2004; 8: 297–306.
38. Bastide G, Zadeh J, Lefebvre D. Are the 'little muscles'what we think they are? Surg Radiol Anat, 1989; 11: 255–6.
39. Key J, Clift A, Condie F, Harley C. A model of movement dysfunction provides a classification system guiding diagnosis and therapeutic care in spinal pain and related musculoskeletal syndromes: a paradigm shift—part 2.J Bodywork Mov Ther., 2008; 12: 105–20.
40. Legrand A, Schneider E, Gevenois PA, De Troyer A. Respiratory effects of the scalene and sternomastoid muscles in humans. J Appl Physiol, 2003; 94: 1467–72.
41. De Troyer A, Kelly S. Action of neck accessory muscles on rib cage in dogs. J Appl Physiol, 1984; 56: 326–32.