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Cervicobrachial Pain Syndrome: Revisiting The Terminology with Implications for Medicine and Health Sciences

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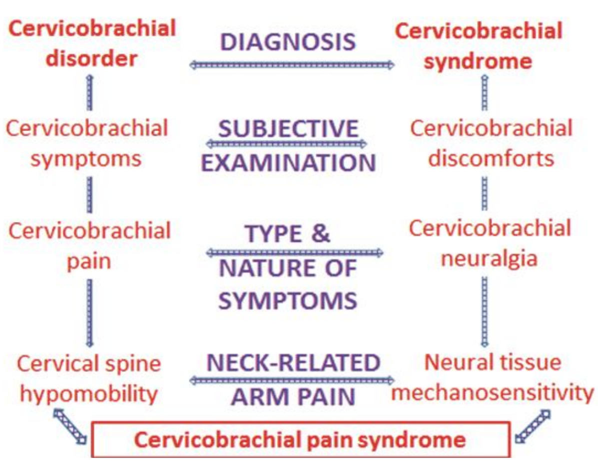
Abstract

This short article is aimed to enlighten the terminology associated with cervicobrachial pain syndrome, and to provide implications for medical and healthcare evaluation and treatment of this condition.

Schematic illustration of inter-relationship between terms and cervcobrachial pain syndrome



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Introduction–definition of terms:

Cervicobrachial disease/ disorder/ syndrome is a clinical diagnosis of presenting symptoms and signs in neck and arm regions. The presenting symptoms are described as cervicobrachial symptoms/ discomfort which include pain and many others upon which cervicobrachial pain or cervicobrachial weakness terms arise. Nerve-related pain in the neck and arm is termed as cervicobrachial neuralgia (CBN). Cervicobrachial pain (CBP) arising from cervical spine hypomobility dysfunction and cervicobrachial neural tissue mechanosensitivity (CBNTM) are two key characteristics of cervicobrachial pain syndrome (CBPS).

Cervicobrachial symptoms or discomfort (present in neck and/or arm) include pain (musculoskeletal and neural), stiffness, weakness, fatigue, swelling, heaviness, sensorimotor deficits, sounds (snapping, clicks, crepitus, clunks) and loss of function (Antonelli et al, 2012).. Presence of pain as a predominant feature characterizes Cervico-Brachial Pain Syndrome (CBPS) whereas neural pain would characterize Cervicobrachial neuralgia (CBN) (Aimard and Charles, 1992).Cervicobrachial neuralgia (CBN) was associated with psychosocial factors (anxiety and depression), clinical signs of C7 dysfunction, acroparesthesia, nocturnal pain, absent reflexes, and shoulder tendinitis (Bouvier, 1992). CBN was also described as a CBPS with stretch-induced neural tissue mechanosensitivity (Qunitner, 1990).

CBPS was commonly prevalent as work-related musculoskeletal disorder of upper limb and was termed as occupational cervicobrachial disease (OCBD) (Kim and Nakata, 2014). Maeda (1977) mentioned, "The factors provoking the OCBD can be divided into two categories, i.e, the ways how the workers use the musculature and strain the nervous system and the conditions in which the job is organized into the work system and is controlled."The disorder was occupationally associated with forced body posture during work, repetitive movements at work, arm strain and cervical spine burden during household activities (Krapac et al, 1992).

Risk factors for CBPS

Among the two studies found; increasing age, female gender, and obesity (Kostova and Koleva, 2001); and, use of vibrating hand tools and playing racquet sports (Dimberg et al, 1989) were reported as risk factors for developing CBPS.

Diagnosis of CBPS

Symptoms

- Primary complaints of neck and arm pain
- Onset and progression of symptoms suggesting regional inter-relationship in source of symptoms (similar mode of onset- sudden / gradual / insidious; type of progression- worsening / improving; rate of symptom progression- slow / rapid)
- Symptom behavior suggesting "neck-related arm pain" (NRAP), aggravating and relieving activities of one segment influence the symptom manifestation at the other (eg., neck movements produce arm symptoms or vice versa).
- Ipsilaterally reduced neck mobility in specific directions during neck movements and activities.
- Ipsilateral findings of alteration of nerve-related arm symptoms (pulling, tingling and numbness, pins and needles, shooting pain) with local touch / pressure and activities of hand or wrist.

Signs

Postural examination- deviations, with asymmetry in skeletal and soft tissue appearance and alignment (cervical spine lateral shift towards or away from side of symptoms; elevated / depressed shoulder girdle as a pathological / protective postural deformity) (Greenman, 1992).

Tests for cervical spine hypomobility- active intervertebral movement testing (AIVMs) showing frontal / transverse plane deviations during flexion / extension testing; passive physiological intervertebral mobility testing (PPIVMs) showing asymmetry in lateral flexion and rotation range of motion; and passive accessory intervertebral mobility testing (PAIVMs) indicating single / multiple level hypomobility dysfunction suggesting ipsilateral / contralateral shift of vertebra (Maitland, 1986).

Tests for neural mechanosensitivity-Tinel's sign producing local elicitation and reproduction of nerve-related symptoms; Nerve trunk palpation along the nerve's course demonstrating mechanical allodynia (pain on touch / pressure) (Butler, 1988); and, Neurodynamic testing demonstrating positive findings with structural differentiation in mid-range or end-range suggesting slider or tensioner dysfunctionrespectively (Shacklock, 2005).

Cervicobrachial muscle activity was evaluated in two studies; the former on influence of posture and the latter on influence of cognitive challenge.

Postural correction and cervicobrachial muscle activity

Mclean (2005) found that postural correction reduced the muscle activity of levator scapulae, upper trapezius, supraspinatus, posterior deltoid, masseter, rhomboid major, cervical erector spinae and sternocleidomastoid in the dominant side in asymptomatic subjects during computer work.

Cognitive challenge and cervicobrachial muscle activity

Leyman et al (2004) found that dual task paradigm involving cognitive load in office-type tasks produced 61% higher muscle activity in upper trapezius, 6-11% in cervical erector spinae, which was also associated with 23% decreased typing productivity.

Differential diagnosis

There were two clinical conditions reported: Thoracic outlet syndrome (Ozoa et al, 2011) which is a sinister pathology; and, Vertebral artery loop formation (Paksoy et al, 2003) which is a clinical red flag.

Conservative interventions for CBPS

Salt et al (2011) performed a systematic review to assess effectiveness of non-invasive therapy for the management of cervicobrachial pain, in terms of pain, function and disability. The review included 11 studies and the interventions included general physiotherapy, cervical traction, manual therapy, exercise therapy, and behavioral change approaches. Manual therapy such as use of CLG, exercise and behavioral therapies reduced pain but mixed results were noted for effects on functional disability.

Rehabilitation

Work conditioning

Parenmarkand Malmkvist (1992) studied 33 patients who underwent a 4-8 weeks of individualized on-the-job training and gradual return-to-work. Following the intervention, the total number of work-related absence due to recurrences was found to be lower among the subjects.

Physical Therapy

Nemes et al (2013) studied a heterogeneous population (with CBPS) of dentists who were treated either with medical treatment alone or in combination with physical therapy for a 2-year period. The outcome measurements included visual analogue scale (VAS), the Health Assessment Questionnaire adapted for Dentists (HAQD) and the number of days of work-related absenteeism. The study found significant improvements of functional parameters and increase in work productivity in dentists who underwent physical therapy.

Active versus passive methods

LevoskaandKeinänen-Kiukaanniemi (1993) studied 47 female employees with occupational cervicobrachial disorders who were treated either with dynamic muscle training of neck and shoulder muscles (active physiotherapy)or with surface heat, massage, and stretching (passive physiotherapy).Lesser incidence of headache, maximum isometric muscle strength and endurance of shoulder muscles, and increased pressure thresholds were observed in active group compared to passive group.

McKenzie treatment

Rasmussen et al (2001) studied a cohort of 60 patients with cervical radiculopathy who presented with CBPS and compared the treatment outcomes between those who received financial compensation versus those who did not.The former group reported lack of treatment-associated improvement, with adverse effects.

Mechanism-based reasoning and spinal manipulation

Increased knowledge of the pathogenesis of upper quadrant pain syndromes have demonstrated evidence of peripheral and central sensitization mechanisms in different local pain syndromes of the upper quadrant and spinal manipulation has been found to be effective for patients with cervicobrachial pain (Isabel de-la-Llave-Rincón et al, 2011).

Cervical lateral glide technique

Coppieters et al (2003) studied the immediate effects of CLG compared to that of therapeutic ultrasound in 20 patients with sub-acute neurogenic CBPS by measuring range of elbow extension (EE), symptom distribution (SD), and pain intensity (PI) during the median nerve provocation testing. The mobilization group showed significant increase in EE, decrease in area of SD and decreased PI.

Coppieters et al (2003b) studied shoulder girdle elevators force generation during median nerve provocation testing and changes following CLG mobilization versus therapeutic ultrasound in 20 patients with neurogenic CBPS in their single-blind randomized clinical trial. The study found aberrant force production in involved side compared to uninvolved side which was normalized after CLG treatment compared to control intervention.

Cowell and Philips (2002) evaluated the effectiveness of CLG in a 44-year-old woman with an 8-month history of neurogenic CBPS who had abnormalities of neural tissue mechanosensitivity and C5/6 disc pathology on MRI. Upon a 4-week pre-assessment, 4-week treatment and 2-week home exercise, beneficial improvements were reported for pain, functional disability as well as cervical and shoulder mobility which were maintained over the home exercise phase and at 1-month follow-up.

Summary and implications

From the pooled evidence, it is warranted that this clinical entity of CBPS should be identified not only as a diagnosis of exclusion but also as a sinister pathology co-existing with other specific diagnoses. Conservative interventions should be considered, especially manual therapy techniques such as cervical lateral glide, with need for more high quality randomized clinical trials comparing conventional treatment methods. Medical and healthcare professionals need to recognize this condition in primary care so that appropriate referral would be done for conservative treatments.

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Conflicts of interest

None identified and / or declared.

References

1. Aimard G, Charles N.Cervicobrachial neuralgia: diagnostic problems in neurology.J Neuroradiol. 1992; 9(3):149–53.
2. Antonelli BA, de Paula Xavier AA, Oenning P, Baumer MH, da Silva TF, Pilatti LA. Prevalence of cervicobrachial discomforts in elementary school teachers.Work. 2012; 41Suppl 1:5709–14.
3. Bouvier M1.Clinical semiology of common cervicobrachial neuralgia. Data from 50 hospital cases.J Neuroradiol. 1992;19(3):146–8.
4. Butler D. The sensitive nervous system. NOIgroup publications, Adelaide, 2000.
5. Coppieters MW, Stappaerts KH, Wouters LL, Janssens K. The immediate effects of a cervical lateral glide treatment technique in patients with neurogenic cervicobrachial pain. J Orthop Sports PhysTher. 2003; 33(7): 369–78.
6. Coppieters MW, Stappaerts KH, Wouters LL, Janssens K. Aberrant protective force generation during neural provocation testing and the effect of treatment in patients with neurogenic cervicobrachial pain. J Manipulative PhysiolTher. 2003; 26(2) :99–106.
7. Cowell IM, Phillips DR. Effectiveness of manipulative physiotherapy for the treatment of a neurogenic cervicobrachial pain syndrome: a single case study — experimental design. Man Ther. 2002; 7(1): 31–8.
8. Dimberg L, Olafsson A, Stefansson E, Aagaard H, Odén A, Andersson GB, Hansson T, Hagert CG.The correlation between work environment and the occurrence of cervicobrachial symptoms.J Occup Med. 1989; 31(5): 447–53.
9. Greenman P. Principles of Manual Medicine.3rd edition, Williams and Wilkins, Baltimore, 2003.
10. Isabel de-la-Llave-Rincón A, Puentedura EJ, Fernández-de-Las-Peñas C. Clinical presentation and manual therapy for upper quadrant musculoskeletal conditions.J Man ManipTher. 2011; 19(4): 201–11.
11. Kim EA, Nakata M. Work-related Musculoskeletal Disorders in Korea and Japan: A Comparative Description. Ann Occup Environ Med. 2014; 26: 17.
12. Krapac L, Krmpotiæ A, Paviæeviæ L, Domljan Z.Cervicobrachial syndrome—work and disability.ArhHigRadaToksikol. 1992; 43(3): 255–62.
13. Kostova V, Koleva M. Back disorders (low back pain, cervicobrachial and lumbosacral radicular syndromes) and some related risk factors. J Neurol Sci. 2001; 192(1-2): 17–25.
14. Levoska S, Keinänen-Kiukaanniemi S.Active or passive physiotherapy for occupational cervicobrachial disorders? A comparison of two treatment methods with a 1-year follow-up. Arch Phys Med Rehabil. 1993; 74(4): 425–30.
15. Leyman E, Mirka G, Kaber D, Sommerich C. Cervicobrachial muscle response to cognitive load in a dual-task scenario. Ergonomics. 2004; 47(6): 625–45.
16. Maitland GD. Vertebral manipulation 5th edition, Butterworths, Sydney, 1986.
17. McLean L. The effect of postural correction on muscle activation amplitudes recorded from the cervicobrachial region. JElectromyogrKinesiol. 2005; 15(6): 527–35.
18. Nemes D, Amaricai E, Tanase D, Popa D, Catan L, Andrei D. Physical therapy vs. medical treatment of musculoskeletal disorders in dentistry—a randomised prospective study. Ann Agric Environ Med. 2013; 20(2): 301–6.
19. Ozoa G, Alves D, Fish DE. Thoracic outlet syndrome.Phys Med RehabilClin N Am. 2011; 22(3): 473–83.
20. Paksoy Y, Levendoglu FD, Ogün CO, Ustün ME, Ogün TC. Vertebral artery loop formation: a frequent cause of cervicobrachial pain. Spine (Phila Pa 1976). 2003; 28(11): 1183–8.

21. Parenmark G, Malmkvist AK.The effect of an outpatient rehabilitation program on occupational cervicobrachial disorders.J OccupRehabil. 1992; 2(2): 67–72.

21. Quintner J.Stretch-induced cervicobrachial pain syndrome.Aust JPhysiother. 1990; 36(2): 99–103.

22. Rasmussen C, Rechter L, Schmidt I, Hansen VK, Therkelsen K. The association of the involvement of financial compensation with the outcome of cervicobrachial pain that is treated conservatively.Rheumatology (Oxford). 2001; 40(5): 552–4.

23. Salt E, Wright C, Kelly S, Dean A. A systematic literature review on the effectiveness of non-invasive therapy for cervicobrachial pain. Man Ther. 2011; 16(1): 53–65.

24. Shacklock MO. Clinical neurodynamics- a new system of neuromusculoskeletal examination and treatment.Oxford, UK: Butterworth Heinemann; 2005.