Original Article

DOI: 10.7860/JCDR/2016/16456.7492

Cervicobrachial pain - How Often is it Neurogenic?

Physiotherapy Section

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ABSTRACT

Introduction: Neck pain associated with pain in the arm (cervicobrachial pain) is a common complaint in patients seeking physiotherapy management. The source of symptoms for this complaint is commonly presumed to be neural. However, this pain pattern could also result from various other innervated tissue structures of the upper quarter. Knowledge about frequency of neural structures being a predominant source of symptoms would help in implementing appropriate therapeutic strategies such as neural tissue mobilization along with other complimentary therapies for optimal outcomes.

Aim: To determine the frequency of cervicobrachial pain being neurogenic.

Materials and Methods: Participants (n=361) aged between 20-65 years, reporting cervicobrachial pain were screened for neurogenic nature of symptoms. These physical signs included: active and passive movement dysfunction, adverse responses to neural tissue provocation tests, tenderness on palpating nerve trunks and related cutaneous tissues and evidence of a related local area of pathology (Clinical/radiological). The consistency of all these signs was checked to identify a significant neural involvement.

Results: Descriptive statistics were used to analyse data. Of 361 participants, 206 were males (44.6 ±10.8 years) and 155 were females (41.8 ± 11.2 years). The frequency of neurogenic cervicobrachial pain was determined to be 19.9% (n=72) and the non-neurogenic sources for symptoms were attributed to 80.1% (n=289) of screened participants.

Conclusion: Lower frequency of cervicobrachial pain being neurogenic indicates thorough screening for appropriate therapeutic interventions to be successful.

Keywords: Arm pain, Epidemiology, Neck pain

INTRODUCTION

Neck pain associated with tingling, numbness or discomfort in the arm, upper back and upper chest with or without an associated head ache is considered as cervicobrachial pain syndrome (CBPS) [1]. This complaint is common among the patients seeking physiotherapy interventions for neck and arm pain. Cervical radiculopathy can be a diagnosis of choice for this presentation in presence of frank sensorimotor deficits in the related nerve root territory (dermatome and myotome) [2]. However, thorough neuromusculoskeletal evaluation often indicates absence of deficits in the peripheral nervous system in patients with cervicobrachial pain. The possible reasons for such a presentation can be due to referred pain from dysfunctional somatic sources such as cervical discs, facet joints, upper quarter muscular imbalances with associated trigger or tender points and inflamed neural tissues [3,4]. Clinicians should also bear in mind about the possible non somatic referral patterns presenting as cervicobrachial pain [5]. The results of therapeutic interventions can be improved on identifying the probable predominant source of symptoms.

Previous studies had investigated specific therapeutic interventions for this cervicobrachial pain utilizing electro physical therapeutic modalities, cervical traction, manual therapy, strength and motor control training in cervical region. However, the diagnostic categories for therapeutic interventions are often non-specific or poorly defined [6-8]. Few studies with specific inclusion criteria have utilized neural tissue mobilization and demonstrated better reductions in pain with improved functional outcomes [9-11]. This treatment approach focuses on passive mobilization of mechanically sensitized neural tissue structures with a primary objective of restoring appropriate neurodynamics [9-14]. Hypothesized benefits of this technique include improved neurophysiological and neuromechanical functions of the peripheral nervous system [12,14-18]. However, the appropriate patient selection remains pivotal for success of this intervention.

The estimated frequency of neurogenic CBPS among the patients reporting to physiotherapy practice with neck and arm pain was not reported in the literature. This data on frequency of CBPS being neurogenic will direct the utility of neural tissue mobilization techniques. Appropriate implementation of specific therapy may enhance the chances for early recovery and may reduce recurrence rates. Hence the objective of this study was to determine the frequency of CBPS being neurogenic in nature among the patients seeking rehabilitation.

MATERIALS AND METHODS

This study was conducted at Department of Physiotherapy in a multispecialty tertiary referral center located in coastal region of Karnataka state in India from January 2011 till February 2015. The data presented in this manuscript is an observational finding from the screening process for a pragmatic randomized controlled trial registered in Clinical Trial Registry of India {CTRI/2011/06/001851 -Registered on: 30/06/2011 - Trial Registered Retrospectively}. Approvals from Institutional Research Committee and University Ethics Committee were obtained prior to commencement of the study and were renewed in subsequent years.

Participants aged between 20 to 65 years from either gender with acute or sub-acute onset (symptom duration ranging from a week to six months) of cervicobrachial pain were considered for inclusion in the study. Prior to screening at physiotherapy department, all participants underwent a thorough evaluation by medical doctors of Department of Orthopedics, Neurology and General Medicine for non neuromusculoskeletal sources for symptoms (such as visceral referral source etc.). These participants were then evaluated for neurogenic nature of reported cervicobrachial pain at Department

of Physiotherapy by a qualified physiotherapist with a decade of clinical experience in manual therapy practice.

Participants were considered to have neurogenic cervicobrachial pain syndrome, if their complaints were reproduced, and are consistent with all of the below mentioned physical signs and symptoms. The following signs and symptoms were suggested and described as indicators of neurogenic nature of cervicobrachial pain [1,2,4,5,9,10,14,19-27].

- Active movements of cervical spine (extension, lateral flexion to either side and ipsilateral rotations) and arm movements reproducing pain.
- Symptom reproduction on passive movements in the same pattern as with active movements.
- Elicitation of adverse response (in terms of range of movement and reproduction of symptoms) to neural tissue provocation testing of median, ulnar and radial nerves and subsequent symptom alteration with neural tissue differentiating maneuvers.
- Tenderness at transverse processes of cervical spine (nerve roots), nerve trunks of median, ulnar and radial nerves at different anatomical locations in the course of respective neural tissue.
- Hyperalgesic related cutaneous tissues on palpation (tender points).
- Evidence of a related pathology (example: positive spurling's test or radiological evidence of cervical disc pathology in the vicinity of involved nerve roots or evidence of stenosis at cervical neural foramen as diagnosed by a qualified musculoskeletal Radiologist)

If this detailed physical evaluation failed to demonstrate the consistency of the signs and symptoms, the participant's presentation was considered to be non-neurogenic. Further thorough physical examination with clinical reasoning was carried out to determine other possible sources of symptoms. In a difficult case scenario, consensus was obtained following discussion among authors. The frequency of cervicobrachial pain being neurogenic was documented and the data was computed in Statistical Package for the Social Sciences (SPSS) software version 14. Descriptive statistics were used to analyse the data.

RESULTS

During the study period, 361 participants with complaints of cervicobrachial pain were randomly selected for screening. Of these participants, 206 were males (44.6 ± 10.8 years) and 155 were females (41.8 ± 11.2 years). Neurogenic CBPS was identified in 19.9% (n=72) of the participants as they fulfilled all the signs and symptoms required. These participants were from different work profiles {Business (n=13), Agriculture and related works (n=14), Home maker (n=13), Health care professionals (n=7), General duty workers (n=5), Computer operators and other technicians (n=20)}. The cervicobrachial symptoms in the rest 80.1% (n=289) of the participants were considered to be non-neurogenic in nature.

Among these participants with neurogenic CBPS (n=72), median nerve predominance on neural tissue provocative testing was observed in 68.06% (n=49) participants, radial nerve predominance in 15.28% (n=11) and ulnar nerve predominance was noticed in 11.11% (n=8). About 5.55% (n=4) participants were found to have bilateral neurological deficits and Lhermitte's sign indicating possible compressive cervical myelopathy.

Upon thorough physical examination with clinical reasoning, the predominant non neurogenic sources for the symptoms were identified in the rest of the participants (n=289) reporting cervicobrachial pain. Among these participants, 83.39% (n=241) were identified to have cervical intervertebral disc or facet joint mediated symptoms and cervico-thoracic muscular imbalances (trigger points in levator scapulae, trapezius and scalene muscles). Often, more than one source was attributed for the symptoms in these participants.

Similarly, physician diagnosed cervical degenerative or inflammatory arthropathies contributed for 3.81% (n=11), rotator cuff and other shoulder girdle musculature dysfunctions contributed for 3.11% (n=9) of non-neurogenic sources. Authors also noted associated significant low back pain complaints among some of the screened participants contributing to 9.69% (n=28) indicating possible postural or structural abnormalities necessitating for further evaluation. However, these participants did not demonstrate neurogenic nature of symptoms as well.

DISCUSSION

This study attempted to determine the frequency of cervicobrachial pain being neurogenic in nature and identified nearly one fifth of the screened participants to have neurogenic CBPS. The proportional involvement of the three major nerves of upper quarter was found to be different with predominant contribution from median nerve followed by radial and ulnar nerves subsequently.

Diagnostic blockade is a preferred method of differentiating and establishing the diagnosis for somatic source of symptom [3,20]. However in this study, the structural sources for symptoms were identified based on thorough physical examination complimented with suggestive radiological findings. The screening procedure had included evaluation for symptom reproduction with Spurling's test, neural tissue provocative testing and deficits in ipsilateral cervical rotation range of motion. Existing literature suggests an increase in reliability and validity to identify a neurogenic cervicobrachial pain syndrome on utilizing the mentioned cluster of tests [21,28] This method of screening is justifiable, as the routine clinical decision making strategies depend predominantly on the currently adapted method.

The prevalence for neck pain was widely published in the existing literature [29,30]. However, many studies have failed to address the frequency of specific source of symptoms. The possible reason being multifactorial and multidimensional nature of chronic pain i.e. symptom presentation and nature of response on evaluation can have psychosocial and central sensitization dimensions. However, chronic presentations were not included for evaluation in this study. Hence authors presume the true nature of presenting symptoms as existing in any given clinical scenario.

Presently identified frequency of neurogenic CBPS (19.94%) is in accordance with available literature (6% -31%) indicating variation in frequency with nature of occupation. However, a systematic approach (using a cluster of sensitive and specific clinical evaluation methods) was adapted in the current study to hypothesize the significant and predominant sources of symptom rather than basing on a single test (Shoulder abduction external rotation test) [31]. Future studies may incorporate multiple qualified therapists from multiple centers in the process of screening to substantiate findings.

CONCLUSION

Cervicobrachial pain is a common complaint among the patients reporting to physiotherapy practice. Success of treatment strategies depend on their need for implementation. Lower frequency (19.94%) of neurogenic cervicobrachial pain indicates specific interventions such as neural mobilization techniques should be judiciously applied with appropriate patient selection.

Submission statement: We represent that this submission is original work, and is not under consideration for publication with any other journal.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Aug 24, 2015**
Date of Peer Review: **Oct 24, 2015**
Date of Acceptance: **Jan 01, 2016**
Date of Publishing: **Mar 01, 2016**