



Outcome of Physiotherapy Treatment for Chronic Neck Pain: A Case Study

Mohammad Habibur Rahman*

School of Science and Technology, Bangladesh Open University, Gazipur-1705, Bangladesh.

Abstract

Physiotherapists are autonomous health professionals and they have to deal with familiar and unfamiliar cases in clinical practice in musculoskeletal area. Based on the patients complains and evaluation of complaints, Physiotherapists select different treatment approaches. The aim of the study was to describe the clinical decision as well as treatment of a single case suffering from cervical spine problem. Mrs. X is a 47 years old housewife complained of occasional mild posterior and right lateral neck and right shoulder pain. The intensity of pain was moderately higher in right shoulder than neck. She has been suffering from this problem for last six months. The patient rated her neck pain 3/10 and right shoulder pain as a 6/10 on a numeric pain rating (NPR) scale. Patient also had history of hypertension and taking medication for it. Physician initially diagnosed her as right frozen shoulder and he referred to Physiotherapist for better management. Cervical muscle strengthening exercise, Mulligan and Maitland mobilization applied 3 sessions per week for 4 weeks. Each session consists of 30 minutes. The outcome of this case study would strengthen Physiotherapy practitioners, academicians and researchers knowledge on chronic neck pain management.

Keywords: Physiotherapy, Chronic neck pain.

1. Introduction

The musculoskeletal disorders regarded as limiting factor for uninterrupted performance in daily activities. Within the musculoskeletal disorder, chronic neck pain is increasing throughout the world (Gordon & Bloxham, 2016). Chronic neck pain defined as pain in the neck with or without referred into one or both upper limbs that lasts for at least 3 months (Hoy et al., 2014). The prevalence and burden of chronic neck pain varies worldwide. Overall prevalence of neck pain in the general population is 27.0 per 1000 population (Kazeminasab et al., 2022). In Bangladesh, the prevalence of neck pain is 15.1% (Ali & Mehjabin, 2023).

However, chronic neck pain often leads to a considerably declines in the quality of life, functional limitations, and increased healthcare costs. Physiotherapy has emerged as a comprehensive management of chronic neck pain. The multifaceted nature of physiotherapy allows for a personalized and holistic approach, targeting both the underlying causes and symptomatic relief (Gross et al., 2016).

Physiotherapy is an independent health profession aiming to emphasis on improving the quality of life, habilitation and rehabilitation (World Confederation for Physical Therapy, 2015). In clinical practice, Physiotherapists require sound propositional and non-propositional knowledge in order to deliver evidence based service. However, Physiotherapists have to deal with familiar and unfamiliar cases and they have to apply clinical reasoning skills in order to make diagnosis and formulate treatment plans.

*Corresponding author: Mohammad Habibur Rahman (habibsst@bou.ac.bd)
Journal homepage: <https://jstr.bousst.edu.bd>

2. Materials and Methods

A case study research design followed to find out the outcome of physiotherapy treatment following chronic neck pain.

Case Description

Mrs. X is a 47 years old housewife. She has complained of occasional mild posterior and right lateral neck pain. Pain also present just below to right shoulder joint. The intensity of pain is moderately higher in right shoulder than neck. The nature of pain became sharp and shooting while performing activities. There was no history of trauma in recent past on either neck or right shoulder. She has been suffering from this problem for last six months. Patient rated her neck pain intensity 3/10 and right shoulder pain as 6/10 on a numeric pain rating (NPR) scale. Patient initially consulted to a physician as she thought she might have increased blood pressure (BP). Physician ruled out possible pathological and systemic factors. Physician found no vascular origin of pain. Physician advised her an x ray of cervical spine and right shoulder joint. X ray findings indicated that there were osteophytes at C4, C5 vertebra and normal findings in right shoulder joint. He considered cervical changes as normal age related degenerative process and diagnosed her as right frozen shoulder despite of normal right shoulder joint study as patient finds pain and difficulty to perform ADL's using right upper limb. Pain has been suffering from chronic kidney disease (CKD) for last five years with raised serum creatinine level (2.02 mg/dL). For the reason why non-steroidal anti-inflammatory drugs (NSAIDs) is not suited to control her pain due to CKD. Physician then referred her to K. B. Diabetic and Consultancy Centre, Kamarpara, Turag, Dhaka for Physiotherapist's opinion and consultancy.

Diagnosis

Assessment and Examination

Subjective assessment describes the phenomena and severity of pain. Subjective assessment identifies impairments in activity and limitation in participation as well as contributing psychosocial factors is an essential part to give the clinician a comprehensive understanding of the patient's signs and symptoms.

Objective assessment is an integral part to make diagnosis and it helps to work accordingly based upon hypothesis formulate after subjective assessment (Mathers, 2012). However, objective assessment divided into general and local examination. General examination, the case showed poor sitting and standing posture predominate by forward head protrusion. In local examination, patient rated her neck pain 3/10 and right shoulder pain as 6/10, forward head protrusion 5.5 cm from wall to tragus of ear. The objective assessment consisted of examination of arthrogenic, myogenic and neurogenic test. In arthrogenic test, especially the active range of motion (AROM), there was loss of minimum protrusion, right side flexion and left side rotation, moderate loss of flexion, retraction and extension and no movement loss in left side flexion and right side rotation. In passive range of motion (PROM) with overpressure, there was increased pain, tenderness, and bone-to-bone end feel. During accessory movement in cervical spine reduced joint play motion on C4 and C5 vertebra. Besides myogenic test of cervical spine, there was motor deficit (grade 4 for all muscle groups) in the cervical flexors, extensors, right side flexors and left side rotators and others myotome was normal in strength in cervical spine. Neurogenic test there was impaired sensation indicates compression of the nerve roots they pass besides the vertebral segments. In this case, during the neurogenic test, no sensory deficit found in upper limb dermatome (Hubscher et al., 2013).

Special test such as vertebro basilar artery insufficiency (VBI) which found negative, spurling's and distraction test found positive. She also did not have the involvement of dural nerve so dural sign was negative. In contrast, Spurling's and distraction test was found positive as in x ray there were osteophyte changes found in C4 and C5 vertebra. Moreover, Ghansemi et al. (2013)

found the Spurling's test 50% sensitivity and 86% specificity whereas the distraction test was 44% sensitivity and 90% specificity for mechanical neck pain patients. Based on the subjective, objective assessment and examination, it was about to clear that patient's source of pain was in the cervical spine.

As patient showed positive compression and distraction test with degenerative changes in C4 and C5 vertebral it indicated that patient is suffering from cervical spondylosis. By the reviewing the symptoms and special test of patients, it was clear in accordance with Mintken and Cleland (2012).

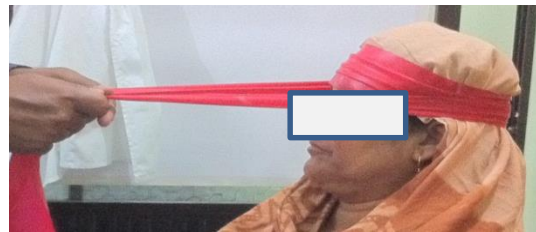
Physiotherapy Treatment

All the exercises performed at center 3 sessions per week for 4 weeks and totaling 12 sessions. Each session consists of 30 minutes.

- Maitland mobilization- grade 1 & 2 oscillatory P/A unilateral vertebral pressure towards the site of pain for 60 seconds (Reid, Rivett, Katekar, & Callister, 2014).
- Patient education on posture and importance of normal alignment during activities of daily livings (Brage, Ris, Falla, Sogaard, & Juul-Kristensen, 2015).
- Mulligan (SNAGs) mobilization-: Antero-superior glides towards the direction of eyeball. While sustaining this pain-free accessory glide, the patient instructed to perform the comparable sign. The procedures repeated in sets of 5 to 10 (Reid et al., 2014).
- Cervical muscle strengthening exercises using a circular thera band performed. Two sets of 12 repetitions directed forward, obliquely, toward right and left, directed backward performed. Rest period between each set was 30 seconds and treatment session lasts for 15 minutes (Jull, Falla, Vicenzino, & Hodges, 2009) (Figure 1).



Maitland mobilization of cervical spine



Cervical strenghtening exercise (extensor) using theraband



Cervical strenghtening exercise (flexor) using theraband



Forward head protrusion measured by tape

Figure 1: Physiotherapy treatment application

Outcome measurement tools

Numeric pain rating (NPR) scale for pain measurement (Walton, et al., 2011), goniometer for measurement of range of motion (ROM) (Mustafa & Sutan, 2013), manual muscle testing for muscle strength measurement, forward head protrusion test: from the wall to tragus of ear by measurement tape and neck disability index to identify the disability level (Macdermid et al. 2009).

3. Results and Discussion

After receiving physiotherapy treatment Mrs. X showed reduction of cervical pain by 1 cm and right shoulder pain by 5 cm. Besides, improvement in passive ROMs by 20°, 15°, 5°, 5°, 10°, 5° and 10° in consequently in flexion, extension, right side flexion, right side rotation, left side rotation, protraction and retraction. In addition, muscle power improved from Grade IV to Grade V in flexor, extensor right side rotator, right side flexor and left side rotator (Table 1).

Table 1: Outcome of Pain, ROM, Muscle Strength

Variables	Tools for Measurement	Pre-test Score	Post-test Score	Comments
Pain	NPR Scale	Cervical: 3 cm	Cervical: 1 cm	Pain decreases by 2 cm in a 10 cm NPR scale
		Right shoulder: 6 cm	Right shoulder: 1 cm	Pain decreases by 5 cm in a 10 cm NPR scale
Passive ROM	Universal Goniometer	Flexion- 70°	Flexion- 90°	Improves by 20°
		Extension- 30°	Extension- 45°	Improves by 15°
		Right side flexion- 40°	Right side flexion- 45°	Improves by 5°
		Left side flexion- 45°	Left side flexion- 45°	Similar
		Right side rotation- 40°	Right side rotation- 45°	Improves by 5°
		Left side rotation- 80°	Lateral Rotation- 90°	Improves by 10°
		Protraction- 30°	Protraction- 35°	Improves by 5°
		Retraction- 15°	Retraction- 25°	Improves by 10°
Muscle Strength	Manual Muscle Testing	Flexor: Grade-IV	Flexor: Grade-V	Improves by Grade-I
		Extensor: Grade-IV	Extensor- Grade-V	Improves by Grade-I
		Right side flexor: Grade-IV	Right side flexor: Grade-V	Improves by Grade-I
		Left side flexor: Grade-V	Left side flexor: Grade-V	Similar
		Right side rotator: Grade-IV	Right side rotator: Grade-V	Improves by Grade-I
		Left side rotator: Grade-IV	Left side rotator: Grade-V	Improves by Grade-I
		Protractor: Grade-V	Protractor: Grade-V	Similar
		Retractor: Grade-V	Retractor: Grade-V	Similar

Many primary musculoskeletal conditions in the neck, thorax, chest wall, often influences referred pain to the arm. That is why it is necessary to examine the joint above. As per description shoulder, examination performed to rule out any shoulder pathology. Finally, the right shoulder joint found normal and there was hypo mobility in cervical spine at C₄ and C₅ level supported by x ray. Patient diagnosed as cervical spondylosis with the symptoms of pain, decrease ROM decrease muscle strength and limited participation in ADLs. The main source of problem originated by imbalance in muscle strength between superficial and deep cervical muscles expressed by neck pain during performing ADLs. Previous studies (Jull et al., 2009) suggested incorporating mobilization and progressive cervical muscle strengthening exercise to minimize these symptoms in session by session. Given that, appropriate evidence based tools used for measurement of outcomes. Evidence suggested that physiotherapist not only always think about pain but also examine role of muscle imbalance to cause neck pain. The new knowledge from this case study was retrieved that muscle balance exercise using theraband is effective treatment for chronic neck pain patient complaining of forward head protrusion and (Jull et al., 2009; Jeyanthi & Arumugam, 2015). Thereby, this study recommends applying this exercise protocol in clinical practice of physiotherapy practitioner for patient with chronic neck pain.

4. Conclusion

Chronic neck pain is a disabling condition affecting the individuals in their daily activities. However, physiotherapy showed as an effective management option for individuals suffering from chronic neck pain. The diversified options of treatment approaches without potential health hazards, physiotherapy helps to minimize the effects of impairments and maximizes the function.

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