Case Report

Altered Riding Posture and Postural Pain in a Motorbike Rider: A Case Report

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Background: Motorcycle riding for prolonged durations, particularly on sport bikes, often requires a flexed trunk posture with thoracic kyphosis and scapular protraction. Sustained faulty riding posture combined with inadequate ergonomic awareness may lead to musculoskeletal disorders involving the neck, shoulder, and upper back. Such biomechanical stress can result in postural abnormalities, pain, and functional limitations affecting activities of daily living. Physiotherapy plays an important role in the conservative management of these conditions through pain reduction, postural correction, and functional rehabilitation.

Case Description: This case report describes a 26-year-old male student who presented with severe right shoulder and upper back pain following an 800-km continuous ride on a sports motorbike performed without adequate preparation or rest intervals. The patient reported progressive pain, morning stiffness, and difficulty performing daily activities. Clinical examination revealed protracted shoulders, increased thoracic kyphosis, trigger points in the thoracic paraspinals and trapezius muscles, and significant tenderness from T1–T6 levels. Baseline pain intensity on the Visual Analog Scale (VAS) was 8/10, with restricted cervical and shoulder range of motion and reduced muscle strength. Radiological investigations, including X-ray and MRI, ruled out structural abnormalities.

Intervention: A structured physiotherapy rehabilitation program was implemented for six weeks. The treatment protocol included heat therapy, myofascial release using instrument-assisted soft tissue mobilization (IASTM), transcutaneous electrical nerve stimulation (TENS), stretching exercises, Swiss-ball–based postural correction, strengthening exercises with Thera-bands, spinal extension exercises, neck isometrics, and functional rehabilitation. The program aimed to reduce pain, restore mobility, correct posture, and improve muscular strength and biomechanical alignment.

Results: Following six weeks of physiotherapy intervention, the patient demonstrated significant improvement in clinical outcomes. Pain intensity reduced from 8/10 to 2/10 on the VAS scale. Shoulder and cervical range of motion improved considerably, and muscle strength increased as measured using a handheld dynamometer. Postural correction was also observed with a reduction in thoracic kyphotic posture and scapular protraction.

Conclusion: Prolonged motorcycle riding with improper posture and inadequate rest can lead to biomechanical stress and musculoskeletal pain in the cervical and thoracic regions. This case highlights the effectiveness of a comprehensive physiotherapy rehabilitation program in managing postural pain associated with motorcycle riding. Awareness of proper riding ergonomics and physical conditioning before long rides may help prevent such conditions.

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Introduction

Humans are biomechanically designed for movement rather than prolonged static postures. Extended periods of sitting can significantly influence spinal biomechanics and increase stress on various musculoskeletal structures. In a static seated position, the pelvis tends to rotate posteriorly, resulting in flattening of lumbar lordosis and increased stress on the posterior structures of the spine and intervertebral discs.[1] This increase in intradiscal pressure is greater during sitting than standing.[2-7] Poor posture and prolonged static working positions are therefore associated with the development of musculoskeletal discomfort and disorders.[8,9]

Motorcycle riders often spend prolonged periods on the road, which exposes the spine and surrounding structures to repeated mechanical stress. Road conditions

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such as uneven surfaces, potholes, and long-distance travel can significantly increase the load on the cervical, thoracic, and lumbar spines. In situations where the vehicle suspension is inadequate, the rider's body absorbs a greater proportion of these mechanical shocks. Consequently, many riders develop neck and back pain due to prolonged riding on irregular road surfaces.[10,11]

Ergonomics is an important factor influencing rider comfort and musculoskeletal health. Unlike car drivers, motorcyclists lack proper back support because most motorcycle seats are not equipped with a backrest. As a result, riders frequently adopt various compensatory postures to maintain balance and control while riding. These prolonged deviations from neutral joint positions may contribute to musculoskeletal pain and postural abnormalities.[12,13]

Sport motorcycles often require riders to maintain a forward-leaning posture, resulting in increased thoracic kyphosis and scapular protraction. When such a posture is sustained for prolonged durations without adequate preparation or rest, it may lead to biomechanical overload of the cervical and thoracic regions. The present case report aims to describe the development of postural pain following prolonged motorcycle riding and to highlight the role of physiotherapy rehabilitation in its management.

Material And Methods

Case Description

Patient characteristics and history

A 26-year-old male presented to the physiotherapy clinic with complaints of progressively worsening pain in the right shoulder and upper back. The patient reported that the symptoms had developed approximately one month prior to visiting the clinic. He was a student preparing for a competitive examination and therefore required prolonged sitting during study hours.

The patient had a previous history of moderate back pain for which he had been treated with muscle relaxants and non-steroidal anti-inflammatory drugs under the supervision of a neurophysician. He had also undergone physiotherapy treatment earlier at another clinical setup and experienced temporary improvement.

However, the symptoms worsened significantly after the patient rode a newly purchased sports motorcycle for approximately 800 km with minimal rest breaks and without prior physical preparation. Following the ride, the patient developed severe pain in the shoulder and upper back region. Initially, the patient underwent physiotherapy treatment elsewhere, which included cryotherapy and ultrasound therapy for one week. However, there was no significant improvement in pain intensity. Subsequently, the patient visited our clinic for further evaluation and management.

The patient described the pain as intense, continuous, and aching in nature. The pain was more severe in the morning and during activities of daily living. Aggravating factors included bending, lifting heavy objects, and stretching of the spine, while rest and analgesic medication provided temporary relief.

Clinical Examination

On initial assessment, the patient reported a pain score of 8–9 on the Visual Analog Scale (VAS). Postural observation revealed protracted shoulders and a stooped posture. The elbows were slightly flexed and positioned close to the trunk. Increased thoracic curvature was also observed, suggesting compensatory thoracic kyphosis.

Palpation revealed swelling over the shoulder blade and bilateral trapezius muscles, graded as 2+ on the pitting oedema scale. Local warmth and severe tenderness (grade 4) were present over the paraspinal muscles between T1 and T6. Trigger points were identified in the thoracic paraspinal muscles and trapezius region.

The active range of motion of the shoulder and cervical spine was restricted due to pain. Radiological investigations, including shoulder X-ray (anteroposterior

Figure 1: Protracted shoulders and a flexed cervical spine with a thoracic hump in the patient before treatment.

Table 1a: Treatment protocol for the patient (week 1)

Treatment	*Dosage*
Heat modality (hydrocollateral packs)	For 10 minutes
Myofascial release with IASTM tools (M-shaped long bar and U-shaped glider) for trigger point release	Proximal to distal stroking. 5-6 strokes on each trigger point
Swiss ball (95 cm VPK ball)	Passive supine lying as much as possible, with rocking movements. For 10 min
LWD- wavelength: 300 meters frequency:1Mhz.	For 15 minutes
TENS- mode-continuous with 100 Hz frequency.	3 repetitions of each muscle per session, with
Conventional Stretching of the shoulder and upper back (sustained static stretches)	40 seconds of hold within the painful limit

Aim- muscle activation and relaxation.

Table 1b: Treatment protocol for the patient (week 2-6)

Treatment	*Dosage*
Heat modality (hydrocollant packs)	For 8 minutes
Stretching of the shoulder and upper back (sustained static stretches)	3 repetitions each muscle per session with 40 seconds of hold reaching the painful limit, followed by agonist antagonist contraction at the end range.
Booster gun as a soft tissue relaxation tool	5 minutes
Swiss ball (95 cm VPK ball)	Comfortable supine positioning for 4 to 5 minutes, with to-and-fro rocking.
Active Exercises	Prone lying spine extension started in painless range, with assistance (starting from 5 reps in 2 sets initially to progressing to 20 reps in 2 sets later per session)
	Sitting 2 to 3 minutes with a straight spine on the ball. Patient commanded to perform spine extension by moving the pelvis on the ball, maintaining the balance.
	Neck isometrics with self-resistance (starting from 5 reps each side to progressing to 10 reps each side with a hold of 10 seconds per session)
TENS- mode-continuous with 100 Hz frequency	Shoulder horizontal abduction with Thera-bands. (progressing from yellow to blue band strength) (starting from 5 reps progressing to 10 reps with a hold of 10 seconds per set, per session)
	Cat camel exercise(starting from 3 reps per set to 10 reps per set, repeating 2 sets per session)
	Bridging (starting from 5 reps per set to 15 reps per set with a hold of 5 sec, repeating 2 sets per session)
	In sitting position, hands placed on waist, Shoulder protraction-retraction with cervical extension (10 reps per session)
	Time: 10 minutes

Aim: Bio-mechanical corrections, muscle rehabilitation and strengthening.

and lateral view) showed normal findings. Magnetic resonance imaging (MRI) of the shoulder also revealed no significant structural abnormalities.

Treatment

A physiotherapy management program was planned at our clinic primarily considering short-term goals such as relief of pain and muscle tension, improvement of range of motion, restoring muscle imbalance, reducing tenderness, and improving posture and muscle strength. Long-term goals considered were complete posture correction, strengthening the muscles, and managing& teaching posture ergonomics to prevent recurrences.

Differential diagnosis

A systematic differential diagnostic approach was applied.[14] Cervical radiculopathy was ruled out as the patient did not report radiating pain or neurological symptoms. Rotator cuff injury was excluded based on MRI findings. Adhesive capsulitis was ruled out due to

Table 2: Changes in the scores of condition specific outcome measures for pain, range, and strength

Outcome measures	At baseline	After 6 weeks
Total pain (VAS)	8	2

Range of motion of the shoulder (goniometer)	*At baseline*		*After 6 weeks*	
	PROM (°)	*AROM (°)*	*PROM (°)*	*AROM (°)*
Flexion	100	95	150	145
Extension	17	14	35	32
Abduction	72	70	135	125
Adduction	72–0	70–0	135–0	125–0
Internal rotation	38	30	65	62
External rotation	12	10	38	35

Range of motion of the neck (goniometer)	*At baseline*		*After 6 weeks*	
	PROM (°)	*AROM (°)*	*PROM (°)*	*AROM (°)*
Flexion	28	25	55	50
Extension	15	12	30	28
Lateral rotation	35	30	60	54

Muscle strength of the shoulder (handheld dynamometer)	*At baseline*	*After 6 weeks*
Flexion	3.5	6.7
Extension	2.8	5
Abduction	3.2	5
Adduction	3	4.5
External rotation	1.5	3
Internal rotation	3.8	5

the presence of passive range of motion. The patient also had no history of trauma or structural abnormalities.

Based on the clinical findings, the final diagnosis was postural pain associated with altered biomechanics due to prolonged motorcycle riding in a faulty posture.

Result

Postural pain was the primary diagnosis of the patient, having intense pain in the shoulder and upper back, and neck, with a stooped shoulder posture. The results post physiotherapy treatment show that a significant difference was found in patients' pain, tenderness, range of motion, and strength of the shoulder and upper back, with rectified posture of the pectoral and shoulder region as compared to the previous condition.

Conclusion

This study concludes that riding bikes in a faulty sitting posture for a longer distance without previous training, insufficient rest in between, and not being properly equipped can cause harmful effects on the neck, shoulder, and upper back region, and how ergonomics plays a significant role in such circumstances. Also, physiotherapy can play a vital role in eliminating the discomfort and pain associated with such conditions. Along with that, this study works as a reminder for motorbike riders to prepare their body first before indulging in such stressful states.

Discussion

In this study, we examined the effectiveness of a physiotherapeutic rehabilitation program in a bike rider patient having shoulder and upper back pain after a long ride. The study was conducted by taking a detailed assessment of the patient and evaluating the pre- and post-intervention values, which showed a significant improvement in the pain, range of motion, and strength of the patient. There are limited studies on the biomechanical or postural pain in bike riders. Thus, the present study emphasized the effectiveness of a physiotherapeutic rehabilitation program in the rehabilitation of a bike rider patient.

Based on the subjective and objective evaluation, a 6-week per day physical therapy rehabilitation program was designed. The program's main goal was to reduce

his shoulder and back pain, improve ROM (range of motion), and strengthen the shoulder and upper back. Data was collected using the VAS (visual analogue scale) scale as an outcome measure for pain, the Goniometer for ROM (range of motion), and the Handheld dynamometer for strength. Local tissue heating, TENS (Transcutaneous electrical nerve stimulation), stretching, and strengthening are some of the exercises included. The given treatment in the study showed that physiotherapy helps in reducing pain and improving ROM and strength in biomechanical and postural pains in bike riders.

Previous studies have shown that the effect of riding a bike for a prolonged period can have an adverse effect on posture and the musculoskeletal system, as in this case, over the cervical, scapular, and back region. But there were not a sufficient number of studies available for such cases. The analysis shows that it is due to improper biomechanics, incorrect ergonomics, and poor comfort. After evaluating the spinal curve, we have found that, if untreated, in the future, this may lead to more severe conditions such as postural deformities, i.e., kyphosis, lordosis, etc., with painful and reduced active range of motions of the affected areas. This has caused the patient severe pain, which has restricted him from doing his ADLs (activities of daily living). The aim was to treat the patient's condition and help him lead a normal life, along with it, making him aware of the recurrence if not taken care of in the future. This study for the future can direct bike riders to be aware of the biomechanical strengths and spine strengthening possibilities that can lead them to take a break, and acquaint them acquainted with the conditioning of the body before any physically demanding situation.

Declaration of Patient Consent

The author certifies that we have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflict of Interest

The authors declare no conflict of interest

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