ISSN No: 0976-5921
Published online at https://ijam.co.in
International Journal of Ayurvedic Medicine, Supplement of International Conference on Ayurveda-Yoga-Nathpanth - 2025

Case Report: Effect of Physiotherapy and Asana on Scoliosis

Research Article

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Abstract

Background: Scoliosis, characterized by a lateral curvature of the spine, often leads to functional limitations, pain, and impaired quality of life. Conventional treatment options include bracing, surgery, and physical therapy. Recently, the role of integrative therapies, particularly physiotherapy combined with specific yoga postures (asanas), has shown promise in managing scoliosis. Objectives: This case report explores the impact of a structured physiotherapy regimen alongside targeted asana practice on the spinal curvature, pain levels, and functional outcomes in a patient diagnosed with scoliosis. Methodology: The physiotherapy interventions focused on strengthening, mobilization, and postural corrections, while the asanas emphasized flexibility, balance, and alignment. Over the course of two months, objective measures, including Cobb angle and spinal range of motion, were assessed along with subjective parameters such as pain and quality of life scores. Results: Cobbs's angle of patient was 12.9 degrees before treatment after treatment it reduces 8 degrees after 45 days of Intervention. Results indicated a significant reduction in pain, improved postural stability, and enhanced functional capacity. The findings support the potential of an integrative approach combining physiotherapy and asana in managing scoliosis, providing a foundation for further research and clinical application in scoliosis rehabilitation.

Keywords: Asana, Physiotherapy, Pain, Scoliosis, Yoga.

Introduction

Scoliosis, a complex musculoskeletal condition involving an abnormal lateral curvature of the spine, can result in substantial physical and psychological challenges (1). While the aetiology of scoliosis varies, it often leads to functional limitations, muscular imbalances, compromised respiratory function, and chronic pain, ultimately affecting quality of life. At least 10° of spinal angulation on the posterior-anterior radiograph associated with vertebral rotation is as scoliosis (2).

Traditionally, scoliosis management has relied on methods such as bracing, surgical intervention, and physical therapy to correct spinal curvature and alleviate associated symptoms. However, these treatments can be invasive, costly, and sometimes insufficient for long-term outcomes.

Recent advancements in holistic health have introduced alternative approaches to scoliosis management, with yoga and physiotherapy gaining attention for their potential benefits in reducing curvature severity and improving function. Specifically, the therapeutic use of yoga postures, or asanas, offers a non-invasive and individualized approach to spinal alignment, flexibility, and muscle balance. Physiotherapy, on the other hand, focuses on strengthening the core and postural muscles, enhancing range of motion, and relieving musculoskeletal pain. Together, these modalities may address both structural and functional deficits, offering a comprehensive approach to scoliosis care.

This case report examines the effects of a structured physiotherapy regimen combined with targeted asanas on the spinal curvature, pain levels, and functional outcomes in a scoliosis patient. The physical examination and radiographs findings of this report provide insights into the potential of integrative therapies to improve outcomes in scoliosis management and support further exploration into combined physical and holistic treatments for spinal deformities.

Case presentation

A 41-year-old male patient presented to the physiotherapy clinic with complaints of chronic back pain, postural asymmetry, and discomfort during daily activities for five years back. He had been diagnosed with scoliosis during adolescence, with a noticeable spinal curvature that had progressively worsened over time. His primary concerns included persistent pain localized to the thoracic and lumbar regions, restricted mobility, and difficulties with prolonged sitting and standing. He reported an aggravation of symptoms with

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physical exertion, and his pain was rated as 7/10 on the Visual Analog Scale (VAS).

On examination, a visible right thoracolumbar curve was noted, resulting in asymmetry of the shoulder and hip levels. Palpation revealed increased muscle tightness on the convex side of the curvature, and reduced muscle tone on the concave side. Range of motion assessments indicated limited spinal flexion and lateral flexion to the affected side. Additionally, functional assessments showed a moderate limitation in activities requiring spinal rotation, such as turning and bending.

Radiographic imaging confirmed a left thoracocervical scoliosis with a Cobb's angle of 12.9 degrees, indicating moderate curvature severity. He had no prior history of spinal surgery but had attempted various treatments, including bracing and general exercise, with limited relief. His primary goal was to reduce pain, improve posture, and enhance functional capacity for daily tasks.

A comprehensive treatment plan was developed, combining physiotherapy interventions with targeted yoga postures (asanas) aimed at strengthening postural muscles, increasing spinal flexibility, and promoting alignment. The physiotherapy sessions included core stabilization exercises, postural corrections, and manual therapy to release muscle tightness, while the asana program focused on stretching and lengthening the concave side of the spine and enhancing balance.

Clinical findings

On physical examination, the patient presented with a visible thoracolumbar curvature to the right, causing noticeable postural asymmetry. There was a prominent rib hump on the right side of the thoracic region, along with a slight elevation of the right shoulder and on physical examination, the patient presented with a visible thoracolumbar curvature to the right, causing noticeable postural asymmetry. There was a prominent rib hump on the right side of the thoracic region, along with a slight elevation of the right shoulder and a compensatory shift in the pelvic alignment. The following clinical findings were noted:

Postural Analysis

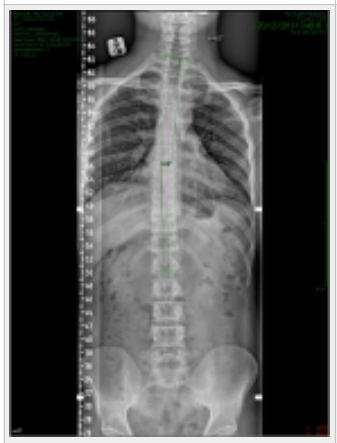
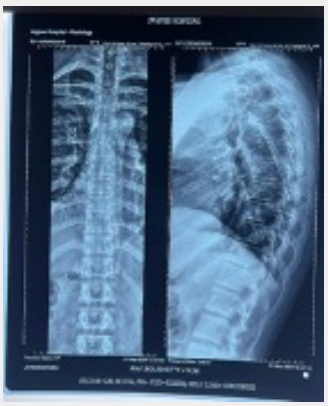
Asymmetry was observed in the shoulder and hip levels, with the right shoulder elevated. The pelvis exhibited a slight tilt, creating a compensatory curve in the lumbar spine.

Palpation

Muscular tightness was present on the convex (right) side of the thoracolumbar spine, particularly in the paraspinal muscles, latissimus dorsi, and quadratus lumborum. Reduced muscle tone was noted on the concave (left) side of the curvature.

Range of Motion (ROM):

- **Spinal flexion**: Moderately limited, with pain reported at the thoracolumbar region.
- **Lateral flexion**: Restricted to the right side, with significant discomfort.
- **Rotation**: Mild restriction on both sides, with increased stiffness in the thoracic region.
- **Neurological Examination:** No neurological deficits were identified. Sensory and motor examinations of the upper and lower limbs were within normal limits, with no signs of radiculopathy.
- **Functional Assessments:** Visual Analog Scale (VAS) for Pain: Reported pain level was 7/10, with exacerbation during prolonged sitting, standing, and physical exertion.
- **Functional Limitation**: The patient reported difficulty with daily activities requiring spinal rotation and lateral flexion, such as reaching overhead, bending, and prolonged sitting.
- **Radiographic Imaging**: Radiographs revealed a right thoracolumbar scoliosis with a Cobb angle of 12.9 degrees, confirming a moderate scoliosis curve affecting the thoracic and cervical regions.

Figure 1: X-RAY (Before) Spine Scoliosis Cobb's angle 12.9 degrees	Figure 2: X-RAY (After intervention) Spine Cobb's angle 8 degrees
	

These clinical findings supported the diagnosis of moderate thoracolumbar scoliosis with associated muscular imbalances, postural asymmetry, and limited mobility, warranting a comprehensive approach combining physiotherapy and targeted yoga interventions to alleviate symptoms and improve function.

Diagnostic Assessment

The patient was assessed based on clinical examination, functional assessment, and radiographic imaging, which together confirmed the diagnosis of moderate thoracolumbar scoliosis with postural asymmetry and associated muscular imbalances.

Clinical Examination:

A detailed postural evaluation indicated a right thoracolumbar curvature, characterized by asymmetry in shoulder and pelvic alignment.

Palpation findings revealed increased muscle tightness on the convex (right) side and reduced tone on the concave (left) side, supporting the diagnosis of scoliosis with compensatory muscular adaptations.

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Functional Assessments

The patient's pain level, measured on the Visual Analog Scale (VAS), was rated at 7/10, primarily localized to the thoracolumbar region and exacerbated by prolonged positions and physical activity.

Radiographic Imaging: Radiographs confirmed a left-sided thoracocervical curve with a Cobb angle of 12.9 degrees, classifying the Range of motion (ROM) testing highlighted restricted spinal flexion and lateral flexion to the right, as well as limitations in rotational mobility, aligning with findings typically seen in scoliosis as moderate. The radiographs showed vertebral rotation and wedging, especially in the thoracic and lumbar regions, contributing to the observed structural asymmetry and functional limitations.

Differential Diagnosis

Differential diagnoses, including functional scoliosis (without structural vertebral changes) and other spinal deformities such as kyphosis or lordosis, were considered and ruled out based on imaging and clinical presentation.

Conclusion: The diagnostic assessment confirmed moderate thoracocervical scoliosis, as evidenced by a Cobb's angle of 12.9 degrees and significant muscular asymmetries impacting posture, range of motion, and daily activities. This diagnosis directed the development of an integrative treatment plan involving physiotherapy and yoga asanas to address the structural and functional components of the patient's condition.

Intervention

Electrotherapy-

- TENS
- Ultrasound
- Deep heat

Manual therapy

- Myofascial release
- Stretching of Upper trapezius muscles, Levator scapulae and scalene muscle.

Exercise Therapy

- Side bend with gym ball

Asana

- *Trikonasana* (Bending towards right side with 2kg dumbbell with 10 sec holding)-10 repetitions
- *Dhanurasana* (holding final pose for 10 seconds) -10 repetitions
- *Marjariasana* -10 repetitions

Discussion

This case report demonstrates a combined approach of physiotherapy and yoga asanas in the management of scoliosis, highlighting improvements in spinal alignment, pain reduction, and overall functional mobility (3), (4). Scoliosis, a structural spinal deformity characterized by lateral curvature and vertebral rotation, often leads to physical discomfort, reduced lung function, and psychological effects due to aesthetic concerns. Traditional management of scoliosis varies based on severity, ranging from observation and bracing to surgical intervention in severe cases. However, conservative treatments such as physiotherapy and yoga can serve as valuable alternatives or adjuncts in cases of mild to moderate scoliosis, aiming to enhance muscle balance, flexibility, and postural stability. Cobbs's angle of patient was 12.9 degrees before treatment after treatment it reduces 8 degrees after 45 days of Intervention.

Physiotherapy in Scoliosis Management

Physiotherapy interventions focused on core strengthening, manual therapy, and postural retraining play a critical role in scoliosis management. In this case, targeted physiotherapy sessions aimed to strengthen weakened muscles, particularly in the core and back, and reduce compensatory postural habits. Core stabilization exercises are essential for scoliosis patients, as these can prevent further curvature progression by improving spinal alignment and support. Additionally, manual therapy and stretching help reduce muscle tension and stiffness, which is often present in scoliosis patients and contributes to pain and limited mobility. This case suggests that physiotherapy can effectively mitigate some biomechanical imbalances in scoliosis, reducing discomfort and potentially slowing curvature progression.

The Role of Yoga Asanas in Scoliosis (5)

Yoga asanas provide a complementary approach by promoting flexibility, balance, and mind-body awareness. The asanas chosen for this patient, such as *Trikonasana* (Triangle Pose), *Dhanurasana* (Bow pose) and *Marjariasana* (Cat-Cow Stretch), focused on elongating the spine, improving flexibility, and enhancing proprioception. Asanas emphasizing lateral bending and rotation help in creating space between vertebrae, reducing spinal compression, and promoting postural alignment. Moreover, the integrative nature of yoga, involving breathwork and mental focus, can provide psychological benefits that reduce perceived pain and stress, which are often associated with scoliosis.

Observed Improvements and Clinical Implications

The improvements observed in this case align with findings from other studies, which suggest that combined physical therapies can improve postural alignment and functional outcomes in scoliosis. A reduction in pain and increased mobility after the intervention period suggest that muscle engagement,

flexibility, and core stability contribute significantly to scoliosis management. Although structural changes in severe scoliosis are unlikely through non-invasive means, conservative interventions can prevent further curvature progression, maintain functionality, and enhance quality of life.

Limitations and Future Directions

While the improvements observed in this case are promising, several limitations must be acknowledged. The findings are limited to a single patient, and variations in individual response to physiotherapy and yoga can be substantial. Additionally, the degree of improvement in spinal curvature may differ based on the initial Cobb's angle, age, and adherence to therapy. Further research, including larger sample sizes and longer follow-up periods, is required to validate these findings and explore optimal combinations of physiotherapy techniques and specific asanas for scoliosis**.**

Conclusion

This case underscores the potential benefits of combining physiotherapy with yoga asanas in managing scoliosis, emphasizing holistic spinal health through targeted strengthening, flexibility, and balance. Such conservative approaches offer a non-invasive option for individuals with mild to moderate scoliosis and may serve as valuable adjuncts to traditional scoliosis treatments.

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