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Influence of Scapular Stabilisation and Cervical Spine Alignment on Rotator Cuff Function: A Systematic Review

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ABSTRACT

Introduction: The shoulder complex relies on precise interaction between the rotator cuff, scapula, and cervical spine to maintain dynamic stability and mobility. Dysfunction in either scapular control or cervical alignment—such as forward head posture or scapular dyskinesis—can alter neuromuscular activation, reduce subacromial space, and overload the rotator cuff. Conventional rehabilitation often emphasises isolated rotator cuff strengthening; however, growing evidence highlights the value of integrating scapular stabilisation and cervical postural correction.

Aim: This review aimed to evaluate the influence of scapular stabilisation and cervical spine alignment on rotator cuff function, and to determine the clinical impact of combined interventions in shoulder rehabilitation.

Materials and Methods: A systematic literature search was conducted in PubMed, Scopus, PEDro, and Web of Science using keywords including *scapular stabilisation, cervical spine alignment, rotator cuff function*, and *shoulder rehabilitation*. Studies involving adults (≥18 years) with clinically or radiologically confirmed rotator cuff tears and functional limitations were included. Both conservative and surgical management studies were considered. Exclusion criteria were previous shoulder surgery (unless postoperative trials), other shoulder pathologies, neurological disorders, systemic inflammatory diseases, fractures, infections, tumors, or non-compliance with protocols.

Results: Across studies, poor scapular stabiliser strength and altered kinematics were consistently associated with impaired rotator cuff efficiency and increased impingement. Cervical malalignment, particularly forward head posture, was shown to disrupt scapulohumeral rhythm and increase upper trapezius dominance. Interventions incorporating scapular stabilisation (serratus anterior and lower trapezius activation) alongside cervical postural correction demonstrated greater improvements in pain, range of motion, and functional performance than isolated cuff strengthening. Electromyography (EMG) trials further confirmed enhanced muscle recruitment when scapular activation preceded rotator cuff engagement.

Conclusion: This review emphasises that optimal rotator cuff rehabilitation should not be limited to isolated strengthening but must integrate scapular stabilisation and cervical alignment strategies. Such a holistic physiotherapy approach improves neuromuscular control, accelerates recovery, and reduces recurrence. Incorporating cervical and scapular assessment into routine shoulder rehabilitation protocols is strongly recommended to enhance clinical outcomes and long-term function.

Keywords: Cervical alignment, Dynamic stability, Shoulder rehabilitation

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