

Physiotherapy Rehabilitation does not Normalize Subacromial Impingement Syndrome Patients Onset Time of Periscapular and Rotator Cuff Muscle Activation

Sohel Ahmed*

Department of Musculoskeletal Physiotherapy, Maharishi Markandeshwar University, Haryana, India

Editorial

The exact patho-anatomy of Subacromial Impingement Syndrome (SIS) is unknown. The idea of the acromion mechanically irritating the subacromial contents [including the subacromial bursa and the supraspinatus tendon] was first postulated and later popularised in 1867, along with a recommended surgical therapy. Our knowledge has lately developed to see SIS as a collection of underlying illnesses rather than a single disorder. SIS appears as a varied presentation with a variety of symptoms such as discomfort, deficits in range of motion (ROM), strength, motor control and function. Shoulder function necessitates the interplay of coordinated movement [particularly at the glenohumeral and scapulothoracic joints], appropriate muscle strength and sensory system activity.

The existence of SIS may have an impact on any of these systems, albeit it is unclear whether they are a cause or a result of SIS. Typically, SIS rehabilitation focuses on pain reduction, increasing objective measures of ROM and strength and restoring altered mobility and shoulder function. Regaining altered movement appears to be more difficult than recovering other clinical features because motor control necessitates sensorimotor systems that integrate peripheral sensation (afferent information via proprioceptive receptors), motor regulation (efferent response via neuromuscular control) and central pathways (processed at spinal level, brain stem, cerebral cortex and cerebellum). Motor control [afferent and efferent information] is evaluated clinically by the use of functional tests, muscular strength testing, and/or muscle electromyography [1].

Electromyography (EMG) studies in healthy participants have shown enhanced muscle activation and strength after shoulder workout regimens. When the beginning time of activation is investigated, conflicting findings emerge. EMG investigations in periscapular muscles in healthy people revealed that the upper trapezius (UT) was activated first, followed by the serratus anterior (SA) and lower trapezius (LT). In participants with SIS, EMG shoulder muscle investigations revealed more variability in onset time activation. Although the interaction between prime movers and the rotator cuff has not showed changes in activation initiation timing when comparing SIS and healthy participants, earlier activation of UT and delayed beginning of SA and LT have been recorded [2].

Despite considerable clinical improvements during the course of rehabilitation, no changes in the onset time of the rotator cuff muscles were detected in this investigation. These data imply that the time of periscapular and

rotator cuff muscle activation is not well connected to improvements in clinical characteristics and so may not be an ideal rehabilitation goal. Furthermore, we were unable to identify any pattern of delayed or expected commencement time of activation following a rehabilitation programme. Depending on the circumstances studied, the periscapular muscles showed inconsistent alterations. In the presence of SIS, aberrant shoulder neuromuscular patterns are linked with shoulder dysfunction [3].

During physiological movements, this study shows variations in beginning activation patterns, primarily in the periscapular muscles. In flexion, differences were seen at loaded slow and medium speeds, whereas differences were observed at unloaded slow, medium and rapid rates. Earlier activation of AD and SA, as well as SS and IF in loaded and unloaded situations, has been documented in healthy persons during flexion. Worsley found that 10 weeks of scapula muscle training improved delayed activation of SA and UT, although there was still a delay when compared to a healthy reference group. Alterations in start time of activation were seen during scaption at the loaded slow and medium speeds, whereas the unloaded slow condition witnessed changes at the medium and rapid speeds [4].

Abduction exhibited variations in activation start time at loaded slow (AD and MD), medium and fast speeds, but unloaded slow (UT and MD), medium and fast speeds (AD and SA) showed differences. Again, recent evidence contradicts claims that the beginning time of activation may be postponed following motor control training. Previous research has linked pain and dysfunction to a delayed start of the RC muscles. The current investigation does not support this idea since there were no alterations in the onset time of RC muscle activation despite improvements in pain and function during SIS therapy.

Clinically, the outcomes of this study imply that rehabilitation programmes should focus on restoring ROM, strength and function rather than changes in initiation time of activation. Furthermore, the idea of the "stabilising" function of RC muscles during gross movements is called into doubt, as the beginning time of activation of the RC muscles seems to occur before movement at slow and medium speeds and unloaded but not loaded situations. These findings show that, contrary to our expectations, a "stabilising" role of the rotator cuff muscles does not occur uniformly. Furthermore, despite the lack of a "direction specific" pattern, EMG of the RC muscles revealed an essentially unpredictable beginning time of activation [5].

Conclusion

After completing a structured shoulder physiotherapy programme for SIS, changes in initiation time of activation occur mostly in periscapular muscles. The upper trapezius, anterior deltoid and mid deltoid showed the greatest variations in initiation time of activation throughout all movement conditions (flexion, scaption and abduction), speeds (rapid, medium and slow) and weights (laden and unloaded). In all activities, the unloaded condition showed bigger alterations than the loaded condition, while the rotator cuff muscles did not exhibit changes in initiation time of activation. After successfully completing a structured shoulder physiotherapy programme for SIS, no consistent changes in activation time (earlier or later) were observed.

***Address for Correspondence:** Sohel Ahmed, Department of Musculoskeletal Physiotherapy, Maharishi Markandeshwar university, Haryana, India; E-mail: ahmedsohel41@gmail.com

Copyright: © 2022 Ahmed S. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 01 April, 2022, Manuscript No. jppr-22-67398; **Editor assigned:** 03 April, 2021, PreQC No. P-67398; **Reviewed:** 09 April, 2022, QC No. Q-67398; **Revised:** 17 April, 2022, Manuscript No. R-67398; **Published:** 24 April, 2022, DOI: 10.37421/2573-0312.2022.7.272

Acknowledgement

None.

Conflict of Interest

No potential conflict of interest was reported by the authors.

References

1. Castelein, Birgit, Barbara Cagnie and Ann Cools. "Scapular muscle dysfunction associated with subacromial pain syndrome." *J Hand Ther* 30 (2017): 136-146.
2. Ngomo, Suzy, Catherine Mercier, Laurent J. Bouyera and Alexandre Savoie, et al. "Alterations in central motor representation increase over time in individuals with rotator cuff tendinopathy." *Clin Neurophysiol* 126 (2015): 365-371.
3. Castelein, Birgit, Ann Cools, Thierry Parlevliet and Barbara Cagnie, et al. "The influence of induced shoulder muscle pain on rotator cuff and scapulothoracic muscle activity during elevation of the arm." *J Shoulder Elb Surg* 26 (2017): 497-505.
4. Zech, Astrid, Markus Huebscher, Lutz Vogt and Winfried Banzer, et al. "Neuromuscular training for rehabilitation of sports injuries: A systematic review." *Med Sci Sports Exerc* 41 (2009): 1831-1841.
5. Phadke, Vandana and Paula M. Ludewig. "Study of the scapular muscle latency and deactivation time in people with and without shoulder impingement." *J Electromyogr Kinesiol* 23 (2013): 469-475.

How to cite this article: Ahmed, Sohel. "Physiotherapy Rehabilitation does not Normalize Subacromial Impingement Syndrome Patients Onset Time of Periscapular and Rotator Cuff Muscle Activation." *Physiother Rehabil* 7 (2022): 272.