



**Physiotherapy management of shoulder impingement syndrome in
overhead athletes: An EMG – evaluative study**

ABSTRACT

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PHYSIOTHERAPY MANAGEMENT OF SHOULDER IMPINGEMENT SYNDROME IN OVERHEAD ATHLETES: AN EMG – EVALUATIVE STUDY

Shoulder impingement syndrome (SIS) in overhead athletes is a clinical condition in which there is a mechanical irritation of the rotator cuff tendons and subacromial bursa resulting in significant pain and disability. In this syndrome there is an inability of the scapula to act as a stable unit when humerus moves. The present study explored its effect on %MVIC(maximum voluntary isometric contraction), muscle onset latency timings, isometric strength of scapulohumeral muscles, Hindi SPADI score and acromiohumeral distance(AHD) when the overhead athletes with SIS underwent two different management protocols. The rising prevalence of SIS in overhead athletes makes it imperative to examine the therapeutic effect on SIS.

A total of 80 overhead athletes (17-35 years) with SIS were randomly and equally divided into two groups ie experimental and control group. The recruitment of overhead athletes with SIS was based on clinical examination. The participants in the experimental group and control group were treated for 8 weeks duration. All participants were assessed for the above mentioned outcome measures at baseline, 4thweek and 8thweek.

The %MVIC response before and after 8 weeks of intervention were compared by using a two way repeated measure Analysis of variance(split-plot). Group x time effects for the test values, sEMG revealed a statistically significant result in mean normalized s EMG recording. The difference was also statistically significant for the time effects [Upper Trapezius , Middle Trapezius, Lower Trapezius and Serratus Anterior] ($p < 0.01$).Statistical difference was observed for mean normalised s EMG (%MVIC) when between group analysis was performed ($p < 0.01$).Muscle onset latency timings mean difference was altered in the experimental group. The control group did not demonstrate significant muscle onset timing change.A two way repeated measure Analysis of variance (split-plot) group x time effects, for the test values s EMG revealed a statistically significant result in muscle onset latency s EMG recording. The difference was also statistically significant for the time effects [Upper Trapezius, Middle Trapezius , Lower Trapezius and Serratus Anterior]($p < 0.01$).Statistical difference was observed for muscle onset latency s EMG when between group analysis was performed ($p < 0.01$) except for Lower Trapezius and Serratus Anterior ($p > 0.05$).

The isometric strength change response before and after 8 weeks intervention were compared by using a two way repeated measure Analysis of variance(split-plot)group x time effects for the test values. Isometric strength measurement by hand held dynamometer(HHD) revealed a statistically significant result in isometric strength change.The difference was also statistically significant for the time effects .Statistical difference was observed for isometric strength (%MVIC) when between group analysis was performed ($p < 0.01$).

The pain and disability measured by help of Hindi SPADI scale was initially examined for its ability to quantify pain and disability. The effect size of composite Hindi SPADI was largest (group x time interaction) (0.757 within subjects) (0.814 between subjects) followed closely by the pain subscale (group x time interaction) (0.683 within subjects) (0.228 between subjects). However, only the disability showed non-significant between subject changes ($p > 0.05$). This can provide an important clinical suggestion that disability score improvement is not sufficiently different when manual therapy is added to the intervention. RTUS was done to examine the change in the AHD after the interventions. The AHD was measured at three positions i.e. 0° , 45° and 60° with the patient stabilised into a constant angle position with help of mobilisation belt. Independent samples t-test performed for between group results showed an increase in the AHD readings after intervention in the experimental group ($p < 0.01$).

The findings of the present study supported the beneficial role of combined manual therapy and exercise therapy in altering the %MVIC, muscle onset latency timing, isometric strength of scapulohumeral muscles, Hindi SPADI score and acromiohumeral distance. Comparison of the two protocols experimental (combined manual therapy and exercise therapy) and control (non-specific exercise) demonstrated and concluded the following findings-

- The largest and statistically significant percentage MVIC (s EMG) change post intervention occurred in the experimental group. The effect size of serratus anterior (group x time interaction) was found to be the largest.
- The largest and statistically significant muscle onset latency timing alteration(s EMG) post intervention occurred in the experimental group. The effect size of upper trapezius (group x time interaction) was found to be the largest.
- The largest and statistically significant isometric muscle strength change post intervention occurred in the experimental group. The effect size of LatissimusDorsi(group x time interaction) was found to be the largest.
- The largest and statistically significant Hindi SPADI score change post intervention occurred in the experimental group. The effect size of composite Hindi SPADI (group x time interaction) was found to be the largest.
- AHD can be improved after physiotherapy intervention. The between group analysis post intervention demonstrated a significant increase in AHD in the experimental group.

Keywords –Shoulder impingement syndrome, overhead athletes, acromiohumeral distance Hindi SPADI, s EMG, Isometric strength