

**Efficacy of low-level laser therapy combined with exercise for subacromial
impingement syndrome: a randomized controlled trial**

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ABSTRACT

Objective: To investigate the effect of low-level laser therapy (LLLT) combined with exercise on shoulder pain and disability in patients with subacromial impingement syndrome (SIS).

Design: Randomised controlled trial

Setting: Pontifical Catholic University

Subjects: We enrolled 120 subacromial impingement syndrome patients

Intervention: Groups I (n=42), II (n=42), and III (n=36) were treated with Low-level laser therapy and exercise, exercise only, and Low-level laser therapy only, respectively. Interventions were conducted 3 times a week for 8 weeks.

Main outcome measures: The primary outcome was the change in shoulder pain and disability index (SPADI). Secondary outcomes included changes in the numeric pain rating scale and medication intake.

Results: Average ages of patients in groups I, II, and III were 51.9 ± 8.7 years, 56.0 ± 10.4 years, and 54.2 ± 7.1 years, respectively. Pain scores at baseline ($p=0.829$), 2 months ($p= 0.057$), and 3 months follow-ups ($p= 0.004$) were 6.8 (4.7-7.7), 0.2 (0.0-0.5), and 0.3 (0.0-1.0) for group I; 6.6 (5.7-8.0), 0.5 (0.2-2.0), and 0.2 (0.0-3.3) for group II; and 6.5 (5.1-7.4), 2.4 (0.1-6.7), and 4.0 (2.0-5.0) for group III, respectively. SPADI scores at baseline ($p=0.029$), 2 months ($p<0.001$), and 3 months follow-ups ($p=0.001$) were 60.8 (37.7-70.8), 3.8 (0.0-10.8), and 2.3 (0.8-10.8) for group I; 61.5 (41.5-71.5), 9.2 (3.8-29.2), and 14.2 (1.5-38.0) for the group II; and 73.3 (59.2-80.8), 34.2 (16.9-54.6), and 33.1 (22.3-49.2) for the group III, respectively.

Conclusion: Low-level laser therapy combined with exercises reduce pain intensity, improve shoulder function and reduces pain intensity and medication intake over 3 months.

Keywords: shoulder pain, low-level laser therapy, exercises

Clinical Trial Registration number: NCT 02725749

Ethics Research Committee (protocol 502.756)