Scapular Winging: Effects of Scapular Muscle Training with Proprioceptive Neuromuscular Facilitation Techniques on Shoulder Strength and Function

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Objectives: To investigate the effects of scapular muscle training with proprioceptive neuromuscular facilitation techniques (PNF) on shoulder muscle strength, endurance and function in subjects with winging scapula.
Methods: Forty subjects with bilateral winging scapula were randomly allocated into PNF Group (n=20, age:20.85±1.34 years), and Controls (n=20, age:20.77±1.77 years). PNF techniques in scapular diagonals were applied for scapular positioning and toning of the surrounding muscles for 3 days/week, 5 weeks. Shoulder muscle strength was evaluated diagonally with Biodex System 3 Pro isokinetic dynamometer (Biodex Medical Systems, Shirley, USA) at 60 and 180º/s. The scapular muscle endurance with Scapular Isometric Pinch Test, functional ability with Disability of the Arm, Shoulder and Hand Questionnaire (DASH) was assessed. Paired and independent t tests were used for analysis.
Results: For pre (1) and post (2) applications, significant improvement on 60º/s flexion peak torque/bodyweight (1:36.78±13.05; 2:61.22±29.75), 60º/s extension peak torque/bodyweight (1:65.35±23.27; 2:80.18±38.66), 180º/s flexion peak torque/bodyweight (1:40.69±15.32; 2:50.84±23.90) on dominant sides; scapular endurance (1:31.95±23.06; 2:51.15±31.08 sn) and DASH score (1:7.86±12.00; 2:5.25±9.28) were found in PNF group ($p<0.05$). However, no significant difference was observed for Controls ($p>0.05$). Scapular endurance, flexion and extension peak torque/bodyweight at 60º/s were different in favor of PNF group in intergroup comparisons ($p<0.05$).
Conclusion: Scapular muscle training with PNF may be effective in improving scapular and shoulder muscle strength, endurance and function in subjects with winging scapula.

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