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ORIGINAL ARTICLE

COMPLEX OF REHABILITATION PROGRAM IN INFRASPINATUS SYNDROME

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Abstract

This paper presents a propose of a rehabilitation algorithm program in infraspinatus syndrome at athletes, using a complex program.
Infraspinatus syndrome is the result of damaging of suprascapular nerve during overuse of shoulder and is frequently at volleyball players. We propose a complex assessment of athletes using: physical assessment, functional assessment by specific tests like Hawkin test and Neer test and also other assessments using electrodiagnostic, electromiography by Myomed 134 equipment. Protocol of rehabilitation included conservator treatment that try to improvement motor skills of shoulder, muscle force, mobility and stability of shoulder, using electrotherapy and physical exercises. Results of our study showed to us a good evolution of our patients regards functional, clinic and specific parameters.

Key words: shoulder, assessment, complex physical therapy

Introduction

Infraspinatus syndrome is a part of cuff tendinitis and is at the border between neurologic aspects and thraumatic injuries of shoulder. Infraspinatus syndrome is defined as a condition of frequently painless atrophy of the infraspinatus muscle caused by suprascapular neuropathy. The syndrome typically causes symptoms that mimic those of rotator cuff tendinopathy, and the diagnosis is often overlooked until the condition fails to respond to a traditional rotator cuff treatment program. (1,2) The athlets come to us for shoulder pain, limits of mobility that favorise development of stifness and instability. Most of situations can be treat by physical therapy, kinetic therapy and also drugs therapy, but also exist some situations in wich surgical intervention must to be done, because is need to made a reconstructionof rotator cuff. (3) Infraspinatus syndrome is the result of overuse at shoulder joint in sports such as baseball, volleyball, and racquet sports, in wich when his or her arm is in an overhead or abducted position. (2) Also this syndrome exist at nonathlets persons. Specific of this syndrome is presence of infraspinos atrophy. The incidence of this syndrome was in our studies and our medical practice, around 15-20% at volleyball players.
Etiopathogenics aspects in infraspinatus syndrome
The first point is the biomechanic aspect and anatomic structure of suprascapular nerve that has two sites of potential entrapment: suprascapular notch and spinoglenoid notch. (9) Second site represent the most common site of entrapment. Involvement of this site induces isolated atrophy and weakness of the infraspinatus muscle that characterizes

infraspinatus syndrome. During the movement of the scapula like protracts and retracts with functional use of the upper limb, some traction of the suprascapular nerve can be expected to occur at 1 or both notches. So this nerve will be expose to damaging sheer stress. All these aspects are base on few observations regards spinoglenoid ligament that becomes taut when the ipsilateral upper limb is adducted across the body or internally rotated and so suprascapular nerve is vulnerable to direct compression by the medial border of the spinati tendons at the spinoglenoid notch when the upper limb is abducted and externally rotated. (9,10) Many studies reveal an ischemia that can involve disorders of suprascapular nerve and that is caused by migration of posttraumatic microemboli from the suprascapular artery to the vasa nervorum. Because glenohumeral joint is the most mobile joint from human body, is possible to increase the risk of shoulder instability. (4) Why? Because, during movement, ligamentous structures and the fibrocartilaginous glenoid labrum provide additional static stability, particularly at the extremes of glenohumeral motion. The supraspinatus and infraspinatus muscles dynamically stabilize the shoulder joint through a precise system of force couples and agonist-antagonist coactivation, keeping the humeral head centered in the glenoid socket. (8) Suprascapular nerve disorders disturb this mechanism and could potentially result in proximal migration of the humeral head with secondary impingement of the supraspinatus tendon.

Material and method

We made a study of 20 subjects, average of age was 38 years, most of subjects were athletes and only 3 subjects have not been athletes. Most of them are typical patient, young athletes who reports vague posterior shoulder pain. The pain has an insidious onset and is described as a deep, dull, aching discomfort. Activities exacerbate symptoms including weakness and reduce endurance in performing overhead.

Assessment methods included: physical assessment and functional assessment used specific test for shoulder mobility and stability. (14, 15)

Physical assesment showed to us: atrophy of infraspinatus muscle, sometimes in two cases we observed supraspinatus muscle involvement depend of the site nerve entrapment. Muscle test showed to us presence of weakness of shoulder during abduction and external rotation, pain during movement and limits of mobility. (12,13) We used some specific tests for functional assesment like: Neer test for explore the integrity of infraspinatus muscle during specific movement , internal and external rotation associate with arm flexion. If the pain increase or the movement is impossible the test is positive.

Hawkin test is use for explore also the integrity of rotator cuff muscles during arm flexion at 90^0 elbow flexion 90^0 and rotation, internal and external. Presence of pain or instability not permit the movements, and so the test is positive. (15)

Others test including imagining assesment, like plain radiographic for exclude bony trauma, and also for exclude cervical spine disoders that can involve ranches of brachial plexus. Shoulder MRI may reveal supraspinatus or infraspinatus muscle edemain acute cases and atrophy with fatty replacement in more chronic cases. (5) Also we used electrodiagnostic using Myomed 134 for electromyographythat evidence a denervation , with positive sharp waves and fibrillation potentials. (5,6,11)

Propose of complex rehabilitation programme:

In our research we have two categories of subjects; one of them is in acute phase that needed surgical intervention and chronic phase. We excluded first lot and we apply a

conservator rehabilitation programme at second lot. But even this lot present two phases: acute phase and recovery phase. (12, 13)
Acute phase- has a rehabilitation programme that depends on severity of clinical phenomenous, because in absence of compression we used conservator treatment. So in this situation we proposed a programme of physical exercises for scapular stabilization, increase rotator cuff muscle tonus. So we obtain a possible prevent of impingement syndrome. Also we recommend this objectifies of rehabilitation, even after acute phase, because we can improvement flexibility of shoulder. We added also proprioceptive exercises for increase shoulder stability, muscle force, endurance and muscles balance around shoulder joint. (7, 14) Physical methods included ultrasonic waves and lasertherapy using Danson laser equipment and protocols for tendinitis disorders.
Even most of authors dont present chronic phase of infraspinatus syndrome, we consider that this is the recovery phase. During this phase we prepare the athlets to return to play at soon at possible. Rehabilitation objectifes of this phase are: mentain shoulder mobility, prevention of muscltendinous retraction, promote scapular stabilization and shoulder stabilization, increase motor and muscle control, coordination. For increase muscle force and balance we used exercises with progressive weight begining from 500g, 8-10 repetitions, 3 sets, but under the control of pain and cardiovascular status.For that reasons we used izotonic contraction, concentric and excentric contraction, and if is possible to use usually exercises that are the part from training programme of our athlets.

The end of one rehabilitation programme must include lyometric exercises for development muscle power. Plyometric method can improvement muscle force(6,7) because it combine force and speed contraction, facilitate nervous control and muscle contraction. Also the phisiologyc base of this method is stretching at high speed or shortening at high speed contraction. So exist three phases: excentric, concentric contraction and abosorbtion of mechanic schok.
The recovery phase is during 6-8months even if the athlets begin the sport activity, we must to accord attention for continue the final rehabilitation programme, for prevent another disorders. eturn to play come when our athlets did not have pain, instability or another discomfort. If all these persist our athlets return to play step by step. Of course we consider that is important to have a prophylactic programme that must includ warm –up and cool-down exercises and also is important to use orthetic devices during sport activity.

Results and discussion

Present the dynamic evolution of specific test and pain because we consider that these are important for periodical assesment of our patients.

Figure 1. Joint shoulder amplitude during first two months

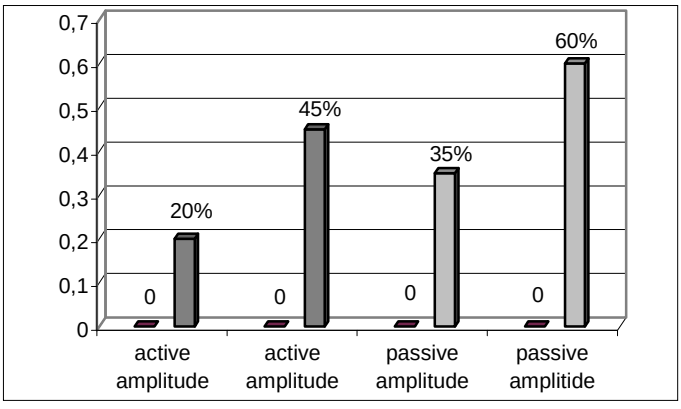


Figure 2. Evolution of muscle force

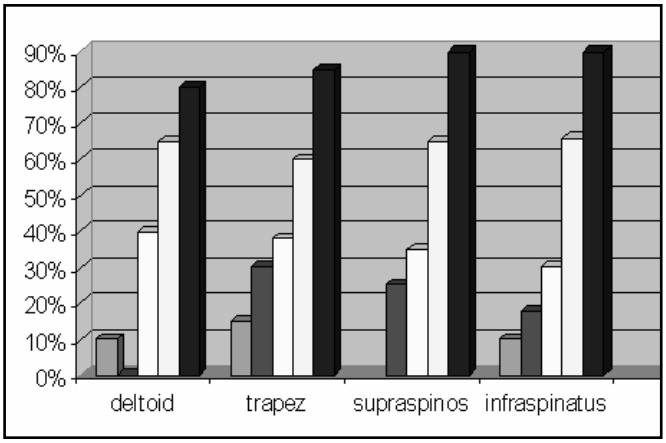


Figure 3. Evolution of Neer test

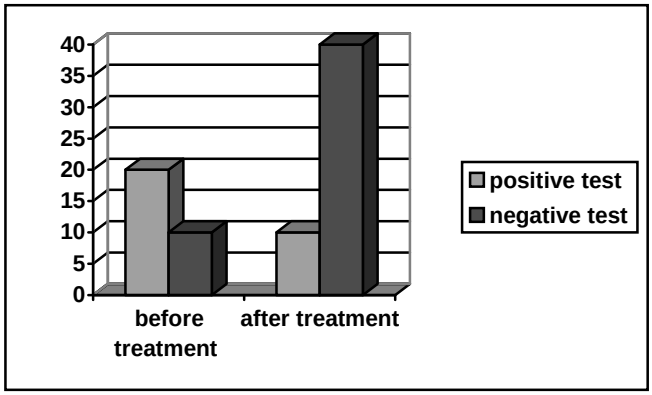


Figure4. Evolution of Hawkin test

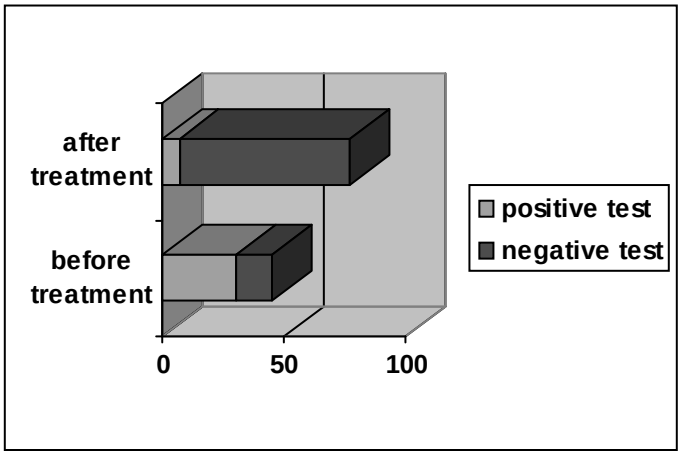
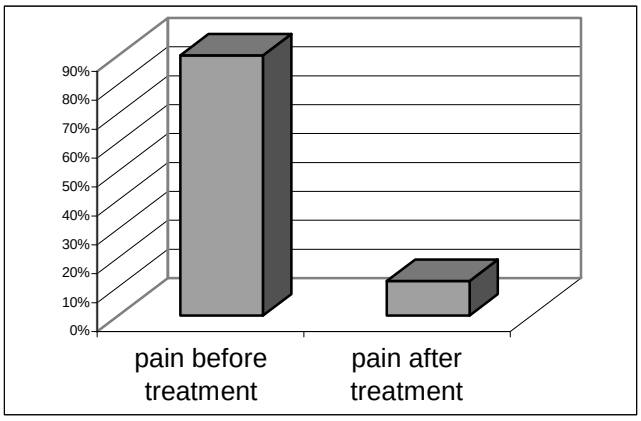


Figure5. Evolution of pain



How we seen is important to make a good assessment for decide which is the best way for rehabilitation and for return to play. So we consider that specific assessment can help us to observe the dynamic evolution in infraspinatus syndrome. Much more if we apply earlier the rehabilitation protocol that we propose is possible to reduce the risk of recidive and the risk to increase shoulder injuries. Most individuals with suprascapular neuropathy are asymptomatic and compete with little to no discernible performance deficit. This observation complicates the issue of how to handle the return-to-play decision.

In symptomatic athletes, a more restrictive course seems reasonable. Once the athlete can perform sport-specific skills in a pain-free manner, they can return to play. Athletes who undergo surgical decompression should participate in an appropriate postoperative rehabilitation program to restore their strength, flexibility, and endurance before returning to play.

No definitive study findings implicate specific spiking styles in suprascapular neuropathy; thus, providing technical advice about biomechanics to volleyball athletes with suprascapular neuropathy is difficult. Additional considerations remain unanswered; for example, the appropriate amount of skill training necessary to minimize the risk of volleyball shoulder is unknown.

The prognosis for a favorable clinical outcome is good. At the time of diagnosis, affected athletes report surprisingly little functional limitation. According to the literature, most cases respond favorably to either conservative treatment programs or, when indicated, surgical intervention, and most athletes were able to return to their prior level of sports participation.

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