Rehabilitation of Shoulder (Rotator Cuff) Injury in Fast bowling Cricketers by Aqua& Theraband (Elasticband) Exercises with Treatment & Diagnosis Evaluation

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Abstract

The main purpose of this research is to rehabilitate shoulder acute and chronic injuries (Rotator cuff muscles) of fast and slow bowlers in cricket. The subjects were gathered from 40 different clubs of District Lahore having confirmed acute and chronic injury of Rotator Cuff (RC). The data was collected from 40 different clubs located in District Lahore. A sample of 105 athletes collected from various clubs and physical assessment test was executed to classify the grade of the injuries. Furthermore, a control group (N=20) has also been taken of more evaluation. Pre and post test has been observed and results calculated after completion of rotator cuff rehab plan. The rehab plan was executed of various hydro and theraband exercises with the duration of 8 weeks and feedback also taken. Principle of specificity, overloading progression and rest and restoration were also executed along with Rest, Ice, compression and evaluation is used as per obligatory. Cronbach's Alpha was used to check the reliability and it s value was 0.82. Analysis (SPSS-26) software utilized, paired sample t-test used and their result showed significant results. The study concluded that shoulder injury can be recovered if diagnosed properly.

Keywords: Aqua therapy, Rotator Cuff (RC), Treatment and Theraband (elasticband).

Introduction

One of the famous and well known injuries in sports are shoulder injuries. In athletes, especially in sports like tennis, handball, volleyball, swimming, gymnastics, field hockey, and lacrosse should injury is commonest among other sports. Injury rates are varies in different sports but should injuries can be

as high as 90% in elite swimmers. These injuries include both acute and chronic issues, affecting athletes regardless of their level of participation (Clarsen et al., 2013). One of the commonest injuries of sports era is shoulder injury. As it generated pain, struck off from sports activity in throwing at school, colleges and university level as well. Cricket has been playing in Asia and all over the world with great passion and now-a-days became a national game in Pakistan, India, Srilanka and Bangladesh (Gill et al., 2023). As the game progressed with speed and agility and its short format demands more aggression which led to injuries and some of the common injuries are shoulder, knee, ankle and dehydration (Millett *et al.* 2006). One of the major injuries of fast bowler are shoulder injuries during bowling as it led to chronic and sometime it will damage ligaments, muscle and bones as well (Gill et al., 2022). all the forces externally applied will be observed of upper body limb by shoulder and classified to be as a primary and main stabilizer joint whose importance is clearly identified in contact sports (Millett *et al.* 2006).

Infect, recent studies claimed that 26, 36, 50 and 60 percent of wheel chair, water polo, tennis, & swimmers are stuck in this common injury. In few decades, the shoulder injury has been elevated in throwing sports e.g javelin, discuss, baseball and cricket (Payne et al 1997., Blevins, 1997; Gill et al., 2022; Gill et al., 2023).The major cause of shoulder chronic injury is the overuse of rotator cuff muscles and longer spells in cricket bawling as well. The hectic training sessions and over training also cause shoulder chronic injury. Even asymptomatic throwing cricketers have a serious concern of pain of rotator cuff (Weiss *et al.,* 2013). An eventual epidemiologic research claims that a same pattern injury of shoulder while playing baseball at college level also reported that in general the percentage at shoulder joint is 19% respectively. In past few years numerous researchers claimed about (91%) of incomplete tears, among them are shoulder injuries which were over look due to their non attention attitudes and led to chronic sometime it is in serious protocols (Kibler, 2006). There are 164 total clubs in the city Lahore and 134 are registered and others are non-registered or not affiliated with the regulatory body as well.

Importance of Study

The main aim of this research is to emphasis on the efficient and effectiveness protocol of rehabilitation of Aqua therapy and elasticband exercises importance which is not only helpful in shoulder rehab program but also valuable in other rehabilitation protocols as well. The mobilization exercises in water not only help in increase flexibility but static water force helps in the recovery and improved range of motion (ROM) around shoulder joint muscles and ligaments.

Objectives of the Study

- To inform trainers, doctors, coaches and relevant personnel about the importance of rehabilitation for athletes suffered from shoulder injury (RC).
- To return to play after complete recovery through Aqua and elasticband exercises.

Research Question

- Rehabilitation with exercises has significant importance in recovery of fast and slow bowling shoulder injury (RC)?
- The execution of Aqua and elasticband exercises helpful in rehab plan is vital & effective for shoulder injuries.

Research Hypothesis

- The Exercise therapy of shoulder acute and chronic injuries recovered through Aquatic and Elasticband exercises helpful in efficient and effective recovery.

Treatment

The initial treatment is to use R.I.C.E (Rest Ice Compression & Elevation) therapy to cut down the swelling and pain if required. The rehabilitation should be started within 24 hours as it will help in fasten the process of rehabilitation and recovery. The treatment should be helpful if you have early diagnosis and grades of the injury. The range of motion can also be stopped by using typing at the injured area. Furthermore, the medicines prescribed by the doctors also have great importance in the recovery of the shoulder injury. Any management strategy must take into account the results of past investigations, treatments, and the retort to old history output (Shaffer and Huttman, 2014; Gill *et al.,* 2019; Gill *et al.,* 2021; Gill *et al.,* 2022; Gill et al., 2023).

Methodology

105 male athletes belonged to 40 clubs of the Lahore district are included in this study. The study is a cross sectional in which qualitative and quantitative approach along with selective sampling with deductive approach utilized. A maximum of 10 subjects selected from each club in the district Lahore. All the male subjects included in this study consist of cricketers, right or left arm fast and slow bowlers. All the subjects fall between 15-40 years age group. A group of N=20, known as control group also selected for future comparison. The study flow the important principle in training and exercise, principal of specificity, overloading, rest & restoration and progression which have been implemented throughout the research. The flow chart of the research is as

shown in Figure.1.

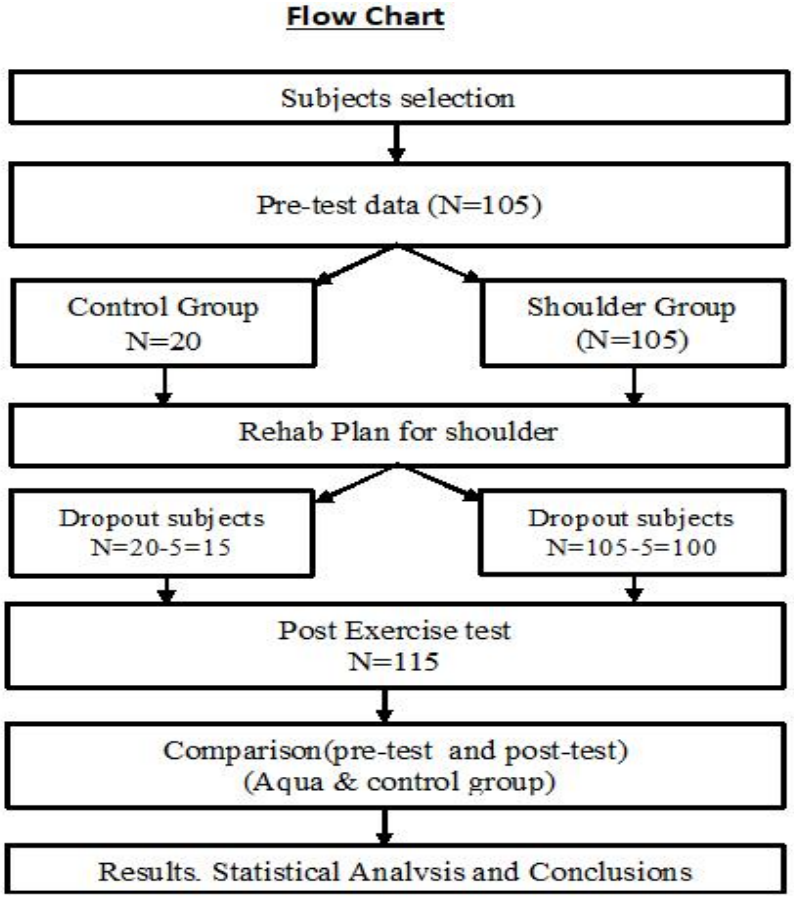

Figure. 1 Shows Flow Chart of Shoulder Injury

Subjects Selection

Diagnosis of the Injury

The diagnosis was done by conducting a physical assessment on the shoulder of the athletes. A number of tests were performed to detect the severity of pain and immobilization of the rotator cuff muscles at pre test procedure. The tests used by the researcher have high validity and reliability values and it have been used in numerous researches in the recent past. Some of the tests used by the researcher in this study are as follows:

1. Empty Can Protocol (Jobe)
2. Drop-Arm (Supraspinatus)

3. Lift-off Test (Subscapularis)
4. Belly Press Test

Shoulder Rehab Exercises Training Plan

Return and play is the main purpose of rehabilitation. The shoulder joint is synovial joint and consists of four major muscles. Infra, Supra, Tares major/minor and subscapularas. The rehab protocols started with principle of specificity, overloading, and rest and restoration. The aquatic exercises started with initial movements of front and back, side and opposite and in reverse direction respectively. The rehab program executed for 8 months in which easy to hard, slow to medium and simple to complex exercises executed progressively (Gill et al., 2019: Gill et al., 2021; Gill et al., 2022; Zhang et al., 2022; Gill et al., 2023). The target rehabilitation plan was executed as mentioned in the table 2 below:-

Rehabilitation Plan for 8 Weeks

Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Exercise Sessions	1-2 days	2-3 Days	3-4 days	Unloaded week	2-3 days	3-4 days	4-5 days	Unloaded week

Rehab Muscles of Shoulder Targeted: There are numerous muscles which support shoulder as prime movers, assistant muscles and stabilizers but major muscles which supported shoulder joint are:-

(a) Infraspinatus (b) Supraspinatus (c) Teres Minor & Teres Major (d) Subscapularis

Rehab Exercises of Aqua & Therabande(Elasticband)

Pendulum in water	Medial and lateral moment (frontage movement) with elasticband
Alphabets in water	Forward and backward moment (Reverse movement) with elasticband
Circular motion in water	Pulling elasticband in straightline upto shoulder
Clockwise & anti clockwise	Abduction and medial rotation exercises with or without theraband
Forward & backward movement of arms in water	External rotation 90° with and without theraband
Side lift of arms inwards and outwards in water	External rotation Arm abduction with and without theraband

Extended arms in 90° and make circles clockwise & opposite direction	Side lift hand through theraband up and down
Forward and backward movement of extended arms in water	Side lift arm diagonally up and down with theraband

Note: After completion of every exercise there should be 30 sec rest.

Results

Table 2: Showing Results of Statistical Implementation

Groups	N	t-value	p-value
Control group	n=15	----------	----------
Rehab Group	n=100	t= -6.5	*** P=0.000

Evaluation (Before and After Exercise test)

The result has been interpreted through four test (*Jobe Test, Drop-Arm, Lift-off & Belly Press*) has been executed after the 8 weeks rehabilitation program. The result interpreted that the range of motion has been increased after execution of the 8 weeks shoulder rehabilitation exercise protocols. The test protocols (*Jobe Test, Drop-Arm, Lift-off & Belly Press*) also showed positive and effective effects as athletes show good strength while pitching the delivery in fast and slow blowing actions. It has also been observe that the pain which has been reported in the initial phase of the assessment during the all assessment tests has been removed through rehabilitation protocols. Furthermore, the strength has also been created in the eight week rehab program which has been executed in water, along with elasticband exercises as well. After the complete treatment protocols including Aqua and theraband exercises showed that the functionality of the muscles improved along with increased in Range of Motion (ROM) and reduction in pain as well. The results showed that aqua exercises with elasticband regain strength, flexibility and ROM effectively and efficiently.

Discussion

The shoulder injury can be prevented as properly diagnosis and early rehab started with proper functional conditioning exercises. Proper technique is one of the major contributors in the field of sports (Gill *et al* 2019, Gill *et al.*, 2022, Gill *et al*., 2023). Very few trainers, coaches, doctors and physiotherapist know the proper way to handle such kind of situation. As a result every year in Pakistan thousands of cricketers left the cricket and other sports due to minor or acute injuries which did not treat properly and thus led to chronic injuries.

Overuse muscles of shoulder or long duration bowling also led to shoulder injuries as stated by Browning & Desai (2004), same results were overlapped with our findings. Correct biomechanics and proper poster not only prevent the cause of shoulder injury but also increase the strength and performance enhancement in the field of bowling. The implementation of joint mobilization and stretching techniques in rehabilitation not only helped in recover the injury but also showed significant improvement results in performance the results are familiar with Sciascia & Karolich (2013) and Tallat et al. (2018). The study also points out that rehabilitation must be conducted after injury which not only increase the life span of the player but enhance the muscles strength and power (Blevins 1997). The study also put light on that shoulder rehab needs to be adopted specific criteria's regarding healing, regain ROM, regain strength, and proprioception restoration the same protocols had been used by Kibler et al. (2003). The shoulder rehab program needs speculated programs that fulfill all the ingredients of properly replenish the whole area of Rotator Cuff Muscles. Thus appropriate rehabilitation plan and combination of aqua and theraband exercises not only helpful in cricket but also for the other injuries as well.

Conclusion

As the study stated that the rehabilitation protocols must be included after injury. Assessment of injury in other words identifying the grades of injury will be more helpful in design of plan. Elasticband and Aqua therapy are helpful in recovery and regain strength efficiently and effectively.

Future Recommendations

Following are few Recommendations for shoulder rehabilitation:-

1. Aqua therapy and theraband exercises are the best source of recovery in shoulder rehabilitation protocols.
2. Create awareness among athletes about prevention and overuse of muscle during the sports.\
3. Ultrasound and Magnetic Resonance Image are one of the best sources of diagnosis tools.
4. The research can be implemented in other sports as well.

References

Blevins, F. T. (1997). Rotator cuff pathology in athletes. *Sports medicine*, *24*(3), 205-220.

Browning, D. G., and Desai, M. M. (2004). Rotator cuff injuries and treatment. *Primary Care: Clinics in Office Practice*, *31*(4), 807-829.

CLARSEN, B., MYKLEBUST, G. and BAHR, R. J. B. J. O. S. M. 2013.

Development and validation of a new method for the registration of overuse injuries in sports injury epidemiology: the Oslo Sports Trauma Research Centre (OSTRC) overuse injury questionnaire. 47, 495-502.

Collin, P. G., Gain, S., Huu, F. N., and Lädermann, A. (2015). Is rehabilitation effective in massive rotator cuff tears? *Orthopaedics and Traumatology: Surgery & Research*, *101*(4), S203-S205.

Edwards, P., Ebert, J., Joss, B., Bhabra, G., Ackland, T., and Wang, A. (2016). Exercise rehabilitation in the non-operative management of rotator cuff tears: a review of the literature. *International journal of sports physical therapy*, *11*(2), 279-301.

Ellenbecker, T. S., and Cools, A. (2010). Rehabilitation of shoulder impingement syndrome and rotator cuff injuries: an evidence-based review. *British journal of sports medicine*, *44*(5), 319-327.

Gill, S, A., Ayub F., and Qazi A. N. (2023). Rehabilitation of Rotator Cuff Acute & Chronic injury in Throwing Sports athletes (Cricket & Baseball) through Theraband & Hydrotherapy Exercises plus Treatment & Diagnosis Evaluation. *Human Nature Journal of Social Sciences* ***4(1)***: 74-89.

Gill, S. A., Akhtar, T., Nazeer, T., and Shahid, H. (2019). Rehabilitation of Acute and Chronic Ankle Sprain of Male Cricketers Through Aqua Exercise. *Journal of the Research Society of Pakistan– 56*(2), 387-400.

Gill, S. A., Akhtar, T., Rafiq, M. T., Naseer, A., Javed, S., and Shahid, H. (2021). Rehabilitation of Acute and Chronic Ankle Sprain for Male Cricketers Through Headway (Isometric, Isotonic and Proprioception) Exercises. *Rehabilitation*, *33*(39B), 250-264.

Gill, S. A., Bilal, M., and Maqsood, M. (2023). Effects of Stretching Exercises on Cricket Wicket Keeper Performance and Reduction of Injury Rate. *Human Nature Journal of Social Sciences*, ***4*(2):** 260-268.

Gill, S. A., Zahid, O., Abdullah, U., Shaheen, M., Naseer, A., Butt, Z. I., and Arslan, M. (2022). Prevalence, Information & Attitude towards Using Supplements among University Athletes, *34*(49A), 7-17.

Kibler, W. B. (2003). Rehabilitation of rotator cuff tendinopathy. *Clinics in sports medicine*, *22*(4), 837- 847.

Longo, U. G., Berton, A., Ahrens, P. M., Maffulli, N., and Denaro, V. (2011). Clinical tests for the diagnosis of rotator cuff disease. *Sports Medicine and Arthroscopy Review*, *19*(3), 266-278.

Millett, P. J., Wilcox III, R. B., O'Holleran, J. D., and Warner, J. J. (2006). Rehabilitation of the rotator cuff: an evaluation-based approach.

JAAOS-Journal of the American Academy of Orthopaedic Surgeons, *14*(11), 599-609.

Pasculli, R. M., and Bowers, R. L. (2022). Evidence-based Management of Rotator Cuff Tears (Acute and Chronic). *Current Physical Medicine and Rehabilitation Reports*, *10,* 239-247.

Payne, L. Z., Altchek, D. W., Craig, E. V., and Warren, R. F. (1997). Arthroscopic treatment of partial rotator cuff tears in young athletes: a preliminary report. *The American journal of sports medicine*, *25*(3), 299-305.

Reinholz, A. K., Till, S. E., Arguello, A. M., Barlow, J. D., Okoroha, K. R., and Camp, C. L. (2023). Advances in the Treatment of Rotator Cuff Tears: Management of Rotator Cuff Tears in the Athlete. *Clinics in Sports Medicine*, *42*(1), 69-79.

Rodriguez-Santiago, B., Castillo, B., Baerga-Varela, L., and Micheo, W. F. (2019). Rehabilitation management of rotator cuff injuries in the master athlete. *Current Sports Medicine Reports*, *18*(9), 330-337.

Sciascia, A., and Karolich, D. (2013). A comprehensive approach to non-operative rotator cuff rehabilitation. *Current Physical Medicine and Rehabilitation Reports*, *1*(1), 29-37.

Shaffer, B., and Huttman, D. (2014). Rotator cuff tears in the throwing athlete. *Sports medicine and arthroscopy review*, *22*(2), 101-109.

Tallat, S., Gill Sajjad Ali., Arshad, Z. (2018). Comparative Study of Male and Female Athletes about Effect of Stretching Exercises on Flexibility,*2*(2), 312-319.

Wang, H., Hu, F., Lyu, X., Jia, H., Wang, B., Liu, F., and Yang, Y. (2022). Kinesiophobia could affect shoulder function after repair of rotator cuff tears. *BMC Musculoskeletal Disorders*, *23*(1), 1-6.

Weiss, J. M., Arkader, A., Wells, L. M., and Ganley, T. J. (2013). Rotator cuff injuries in adolescent athletes. *Journal of Pediatric Orthopaedics B*, *22*(2), 133-137.

Zhang, K., Xia, Q., Lai, S., Li, J., and Fu, W. (2022). A Scoping Review of Postoperative Rehabilitation Protocols After Superior Capsular Reconstruction for Irreparable Rotator Cuff Tears. *Orthopaedic Journal of Sports Medicine*, *10*(9), 23259671221120052.