



ORIGINAL RESEARCH PAPER

Physiotherapy

TO SEE THE EFFECT OF AQUATIC THERAPY PROGRAM VS LAND BASED EXERCISES IN LATERAL ANKLE SPRAIN PATIENTS

KEY WORDS: Fadi Scale, Aquatic Exercises, Land Based Exercises

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ABSTRACT

Ankle sprains are the second most common sports injury after knee injuries, with about 85% of them affecting the lateral ankle ligaments. These injuries are particularly prevalent in sports like basketball and volleyball. To investigate the effect of Aquatic therapy with acute lateral ankle patients to land-based exercise training. The aim of study was to see the effect of aquatic therapy vs. land based exercises in lateral ankle sprain patients and randomly selected 30 subject, in group A (15 case) were treated by aquatic exercises and Group B (15 cases) were treated by aquatic exercises by used FADI SCALE for measurement before and after treatment. Treatment continued for 6 weeks. Results: group A and group B, taking therapy before and after the, result were to be significant but the result after taking Aquatic therapy compare to group A and group B there is no significant difference observed It is concluded that Aquatic therapy is more effective than land based exercises rehabilitation of acute ankle sprain..

INTRODUCTION:

One of the most common injuries were prevalent in sports like basketball and volleyball. An Ankle sprain is actually an injury (Melissa Conrad Stöppler, MD) to the ligaments of the ankle joint, this ligaments are actually elastic, band-like structures that hold the bones of the ankle joint together and prevent excess turning and twisting of the joint. During normal movement of the ankle these band like structures stretches and then drawn back to their original shape and size..In case where the ankle is twisted or stretched much beyond their limits, the ligaments are partially or completely torn causing a severe ankle sprain. The ankle mainly consist of three joints- talocrural joint, subtalar joint and inferior tibiofibular joint^[1,2,3] In medical terminology, the word "ankle joint" is referred to talocrural joint^[4,5].

Most of the injuries occur due to weakness of lateral collateral ligaments The ATFL (anterior talofibular ligament) is the most common ligament which is injured then CFL (Calcaneofibular ligament) and PTFL (Posterior talofibular ligament). ATFL is responsible for plantar flexion and inversion movement of the ankle. So whenever there is excessive inversion movement of the ankle produced lateral ankle sprain. Depending on the type of movement ankle sprains are of two types: 1.Pronation or eversion type, 2.Supination and inversion type. but most common was the Supination or the inversion ankle sprain, and 85% common of all lateral ankle sprains and talofibula ligament is damaged. In case of major sprain. 3 grading of ankle sprain : **Grade 1** is mild or minimal tearing. **Grade 2** is moderate painful with intact ligaments **Grade 3** is severe complete rupture of the ligament.

Aquatic exercises are used in physical therapy especially in normal conditions Water reduce the weight his ankle and warmth and pressure of the water also reduce swelling and increase blood circulation. Consequently, allows early active mobilization and dynamic strengthening.^[6,7] The foot and ankle disability index (FADI) is a 34 item, first described in 1999 by Martin et.al^[8]

Validity: of FADI and FADI sport was also accessed by **Poonyanat Nualon et. al. 2017** through investigating the correlations among both scales, ankle girth measures, weight bearing status and acute ankle sprain moderate to good correlations were noted among the functional measures and between the functional measures and weight bearing status.[9]

Ankle sprain injuries are the most common injury, an estimated 1 million persons, present to physicians are with acute ankle sprains[10]. With such a high number of patients it is required to find out the most effective therapy for treating this injury. The clinical guidelines for lateral ankle sprain are poor and out of date [11].

Aim and Objective:

AIM: To compare the effect of aquatic therapy and land based exercises effects in lateral ankle sprain patients of both group (A and B) separately before and after the given therapy.

Study Design and Methodology:

1. Research Design: was a comparative experimental study.
2. Treatment duration: 6 weeks. 3. Study duration: 1 year 4. Sample size:-15 subjects were included in A and B group separately.

Inclusion criteria:

Subjects of predominantly lateral ankle sprain. With their willingness for taking therapy.

Exclusion criteria: havving

1. Any neurological impairment, cardio respiratory conditions, prgnency,, skin disease, . Diabetes, Lymph edema, hydrophobia, multiple sclerosis, Intoxication.

The foot and ankle disability index (FADI) is firstly described in 1999 by Martin et.al.[8] The two instruments are identical 4th of this item access pain and the 5th item evaluate on individuals ability to sleep. All these 5 items were removed to further improve the instrument.

The FADI specific questionnaire for foot and ankle, consists of total 26 items, 16 items (1-16) related to walking, 6 items (17-22) to daily activity and 4 (23-26) to pain. Each item can be scored on a 5-points. Likert scale (from zero to four), with a maximum total score of 104 points;with other questionnaires is needed. The score 104 means there is no pain and difficulty in day to day life and score 0 means unable to walk or do daily activity.^[9] Study was approved by Ethical committee.

Procedure: Take informed consent of group A and group B, with 15cases in each group.

Group A received aquatic therapy program Group B received land based exercise program.

30 min .exercise for three days in a week for six weeks

After obtaining the baseline measurement and from 1 day subjects of group A (aquatic therapy program) were doing gait training in a pool, single leg balance on the injured leg, double leg line hops, side to side alternate leg bounds, squats^[80] and in group B (land based exercises) consist of pain-free active ROM in all planes, stretching exercises, strengthening exercises, balance and proprioceptive exercises^[83]. Later on subject performed the warm up for the period of 5 minutes. Followed by the respective exercises program for 30 minutes and followed by the cool down for 5 minutes.

Forward then back to the starting position^[18]

Data Analysis and Results:

Data were analyzed using SPSS (version 20) software. Paired T test and independent T test were used to analyze the difference between pre and post value of group A and group B. The data was entered into an excel spread sheet, tabulated and subjected to statistical analysis. Various statistical measures such as mean, standard deviation (SD) and test of significance were utilized to analyze the data. The results were concluded to be statistically significant if, $p < 0.05$.

Table No. 1: Tabular Distribution of Age of Group A and Group B with their mean and S.D and P value.

Groups	Mean with S.D.	P-value
Group A	28.4667 $\pm$ 2.79	0.480
Group B	29.2 $\pm$ 2.80	

Table No. 2: Tabular Representation of PRE-FADI Score of Group A and Group B

groups	Mean with S.D.	P-value
Group A	78.78 $\pm$ 5.31	0.77
Group B	78.26 $\pm$ 4.27	

Table No. 3: Tabular Representation of POSTFADI Score of Group A and Group B

groups	Mean with S.D.	P-value
Group A	90.187 $\pm$ 4.25	0.061
Group B	92.787 $\pm$ 2.90	

Table No. 4: Tabular Representation of FADI DIFFERENCE OF group A and group B

groups	Mean with S.D.	P-value
Group A	11.41 $\pm$ 2.99	0.006
Group B	14.53 $\pm$ 2.74	

Table No. 5: Tabular representation of pre-post of group A and B group. In Pre-FADI and Post-FADI condition.

Groups	Pre-FADI	Post-FADI	P-value
Group A	78.78 $\pm$ 5.3	90.18 $\pm$ 4.2	0.00
Group B	78.26 $\pm$ 4.27	92.78 $\pm$ 2.90	

DISCUSSION:

When ligaments of ankle are torn either partially or completely then it is called an ankle sprain. An ankle sprain is a common injury, lateral ligament injuries or lateral ankle sprain represent approximately 85% of all ankle sprain. Not having rehabilitation program increases possibility for recurrence of the injury. When body center of mass shifts over landing foot results in lateral ankle sprain, this makes the ligament to stretch and tear. Several intrinsic and extrinsic risk factors predispose an athlete to chronic ankle instability. Intrinsic factors may include sex, height, weight, postural sway and foot anatomy. Extrinsic risk factors may include taping, bracing, shoe type and intensity of activity. The purpose of the study was to determine the effect of Aquatic exercise on lateral ankle sprain patients and to compare these effects with land-based exercises among patients with lateral ankle sprain^[1].

Total, 15 subjects where in aquatic therapy (group A) and 15 subjects were in land based therapy program (group B). The result showed that there was statistically significant

improvement on the quality of life and pain reduction with FOOT AND ANKLE DISABILITY index in both groups.

In this study there was one outcome measure used for assessing the quality of life and functions for the data analysis in both group. The outcome measure "FOOT AND ANKLE DISABILITY INDEX" (0.89) is used for the study. FADI is a region specific Self report of function, The result of this study we found that before and after therapy result of group A and group B both so significant improvement that is P value is 0.000 compared with each other they not show any significant improvement, hence null hypotheses is acquired. This states that aquatic and land-based exercises both are useful to improve the stability and reduces the pain^[8,9]. But when we correlate Age with Disability they show significant result as significant value is < 0.05 this means, as age increases the level of disability also increases.

Our findings are in agreement with the result of Fariba hossein adabi *et.al* (2018) who also reported that both the groups, that is water and land based exercises are useful in ankle stability and ROM and thereby to prevent ankle injuries^[12] A balance training program can reduce the risk of ankle sprains as stated by Timothy A. McGuine *et.al*. 2006^[14]. Eunkuk Kim *et.al*. (2010) conducted a study to compare outcome between aquatic and land based during early phase recovery and reported that aquatic exercises may provide advantages over standard land-based therapy for the initial phase of a rehabilitation program^[13].

Hence the present study provides strong evidence that aquatic therapy program and land-based exercises both are significantly effective in lateral ankle sprain. Further studies with longer observation duration are required to know long term improvement in lateral ankle sprain patients.

CONCLUSION:

This present study concluded that the result in improving ankle ability and quality of life with the help of aquatic therapy program and land based exercises in the lateral ankle sprain patients. The null hypothesis is accepted which states that both aquatic and land-based exercise is effective in lateral ankle sprain and can be advised for the patients with ankle sprain.

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