بسم الله الرحمن الرحيم

" الحَمْدُ لِلَّهِ الَّذِي هَدَانَا لِهَذَا
وَمَا كُنَّا لِنَهْتَدِيَ لَوْلا أَنْ هَدَانَا اللَّهُ"

-الأعراف ٤٣-

EFFECT OF ORBITRAK TRAINING ON STRENGTH UPPER LIMB MUSCLES POST RENAL TRANSPLANTATION

تأثير التمارين العلاجية على الجزء العلوي في حالات

ما بعد استئصال الكلى

By

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Introduction

Chronic renal failure (CRF) a major health problem has shown a significant increase in recent years with greater financial demands.

(Maniam et al., 2014)

Kidney transplantation is the treatment of choice for patients with end-stage renal disease (ESRD). It restores renal function and ameliorates most complications of chronic kidney disease.

(Giannaki et al., 2013)

Statement Of The Problem

- Did the aerobic exercises have a significant effect on mobility and strength of upper limb in post renal transplantation patients?

PURPOSE OF THE STUDY

To investigate the benefits of Aerobic exercises in improving upper limb ROM and therapeutic strength in post renal transplantation patients.

SIGNIFICANCE OF THE STUDY

Patients with chronic renal failure (CRF) have a considerably lower level of physical endurance than the population of people at the same age.

Kidney transplantation as a means of renal replacement therapy has been demonstrated to have favourable effects on peak exercise capacities for ESRD.

Post renal transplantation (RT) patients suffer from general fatigue, limited ROM and muscle weakness especially in upper limb. Exercise tolerance is reduced in kidney transplant recipients compared to sedentary individuals. Reasons for this reduction may stem from the normal aging process, inactivity and sedentary lifestyle resulting from the lifestyle of ESRD and hemodialysis, or as result of uremia and its effect on the heart and muscle pre transplant. Regardless of the reasons for the decline, improvements in exercise capacity should be a primary consideration for this population (Painter et al., 2011).

HYPOTHESIS

It was hypothesized that:

- It was be hypothesized that aerobic exercises had a significant improving effect on the mobility and muscle strength of upper limb in post RT patients.


SUBJECTS,
MATERIALS,AND
METHODS

Subjects:

Thirty patients with ages ranging from 20 to 50 years and suffered from limited ROM and Muscle weakness in upper limb post RT. They were selected from the outpatient clinic of Mansoura Urology and Nephrology Center (UNC). They were free from any other health problems that may affect results of the study as pregnancy location, hepatic disease and thyroid disease. The study was carried out between Jan 2015 and Sep 2015.

The patients were assigned into two groups equal in numbers:

Group(A):(Exercise Group) Strengthening Exercises:

It is the first study group who received aerobic exercise on upper limb (30 minutes) session 3 times/week for 8weeks. Also, all patients will receive the same medical care and medications.

Group(B):OrdinaryTherapyRegimen:

It is the second group who received medication only.

Both group1 & group 2 received the same medical care and medications.

Inclusion criteria:-

The patients were chosen under the following criteria:

- The patients' ages were ranged from 20 to 50 years.
- All subjects were postRT.
- Presence of limited ROM and muscle weakness in upper limb involved within this study.
- All patients were screened by an urologist before starting of the study.
- Screening of all patients were done by the same urologist.
- All patients received the same necessary required drugs.

Exclusion criteria:

- Uncontrolled hypertension.
- Marked hypotension.
- Patients with life threatening disorders as hepatic failure and myocardial infarction.
- Pregnant females.
- Patients who suffered from hyperthyroidism, hemorrhage, acute viral disease and mental disorders will be excluded from the study.
- Patients with hemorrhage especially hemorrhaged digestive system.
- Patients with severe fungal diseases and acute viral diseases.
- Patients with tumors.
- Patients with peacemakers.
- Patients with bronchial asthma and respiratory infection.

Equipment and Tools:

Measuring Tools:

Figure (1):Electronic Goniometer.

FIG (2): BASE LINE PUSH/PULL HAND HELD DYNAMOMETER (HHD).

HHD accessories

Fitted grape

Fixation belt

Measurement Procedures:

FIG(3):**Assessment of the muscle power using the hand held dynamometer.**

Figure (4):Assessment Range of Motion using Electronic Goniometer

Therapeutic Equipment:

(a)Aerobic Exercise:

Physical activity using large muscle groups. This type of exercise strengthens the heart and lungs and improves the body's ability to use oxygen. The Aerobic Exercise was used to improve the patient upper limb.

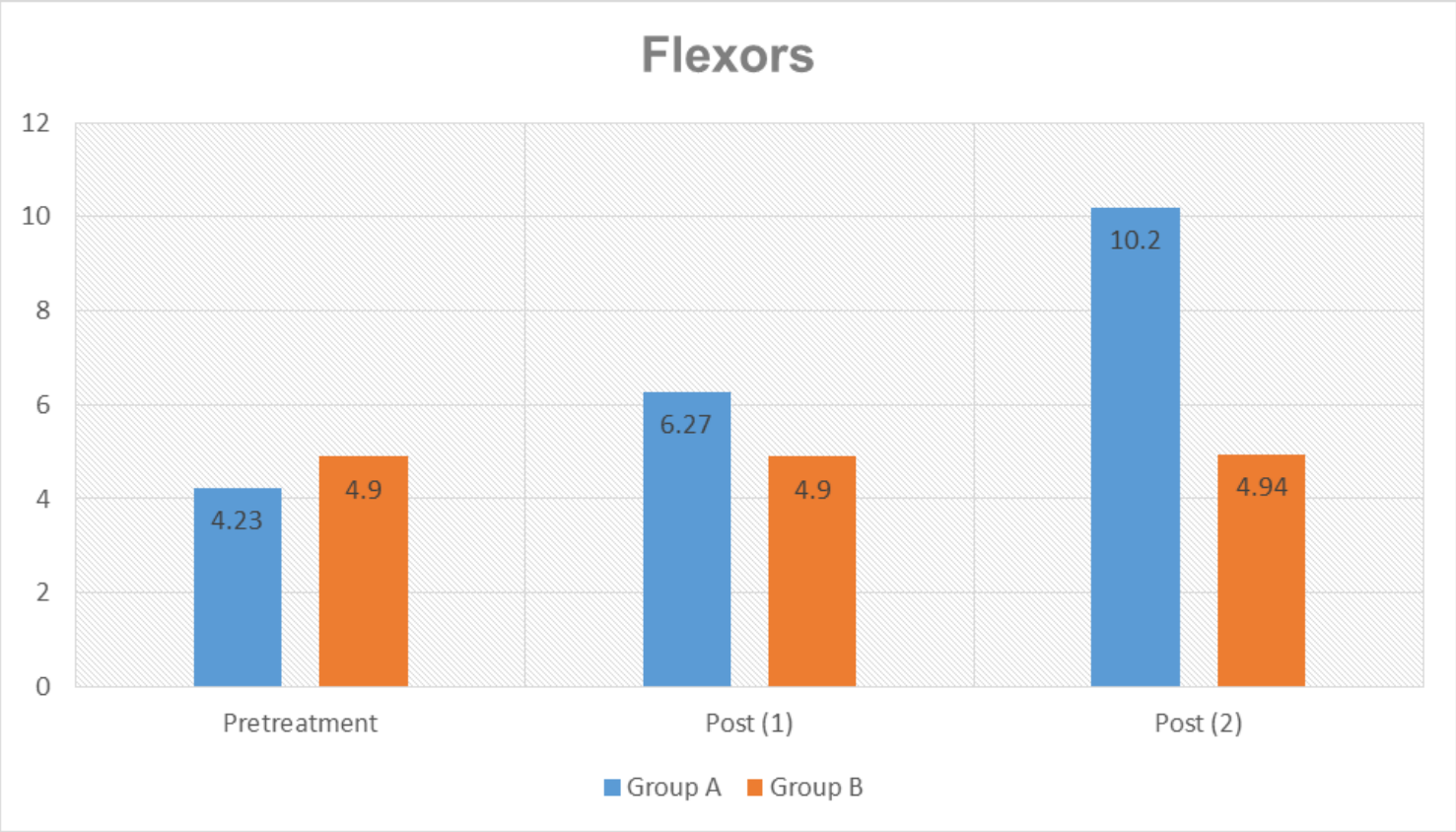
(a)Orbitrek :

Orbitrek the ingenious 2-in-1 full body workout machine that was used in aerobic training to increase the upper limb ROM and muscle strength.

Figure (5):Patient using the Orbitrek trainer.

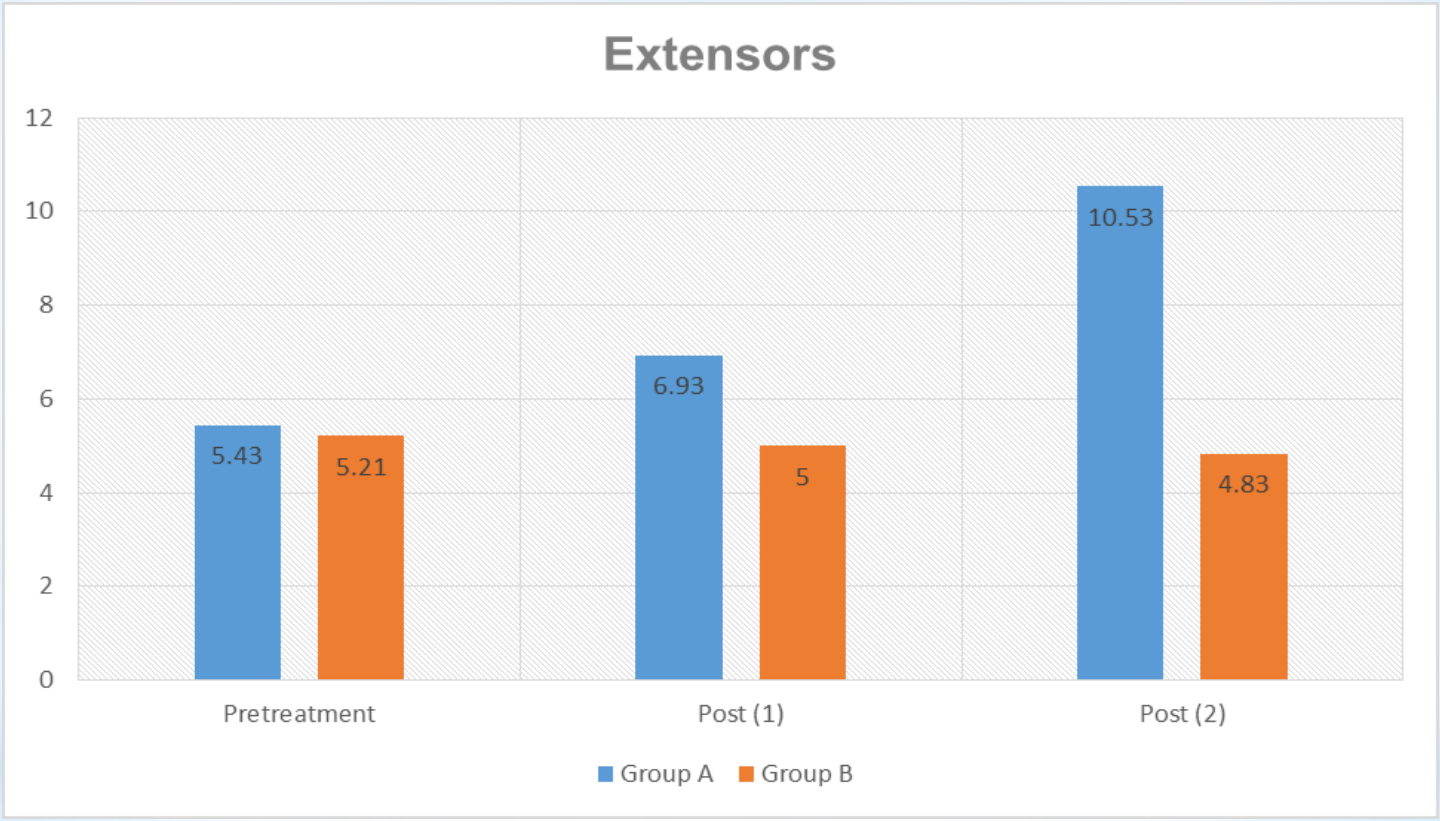

Results

1) Muscle strength in the left elbow flexors:



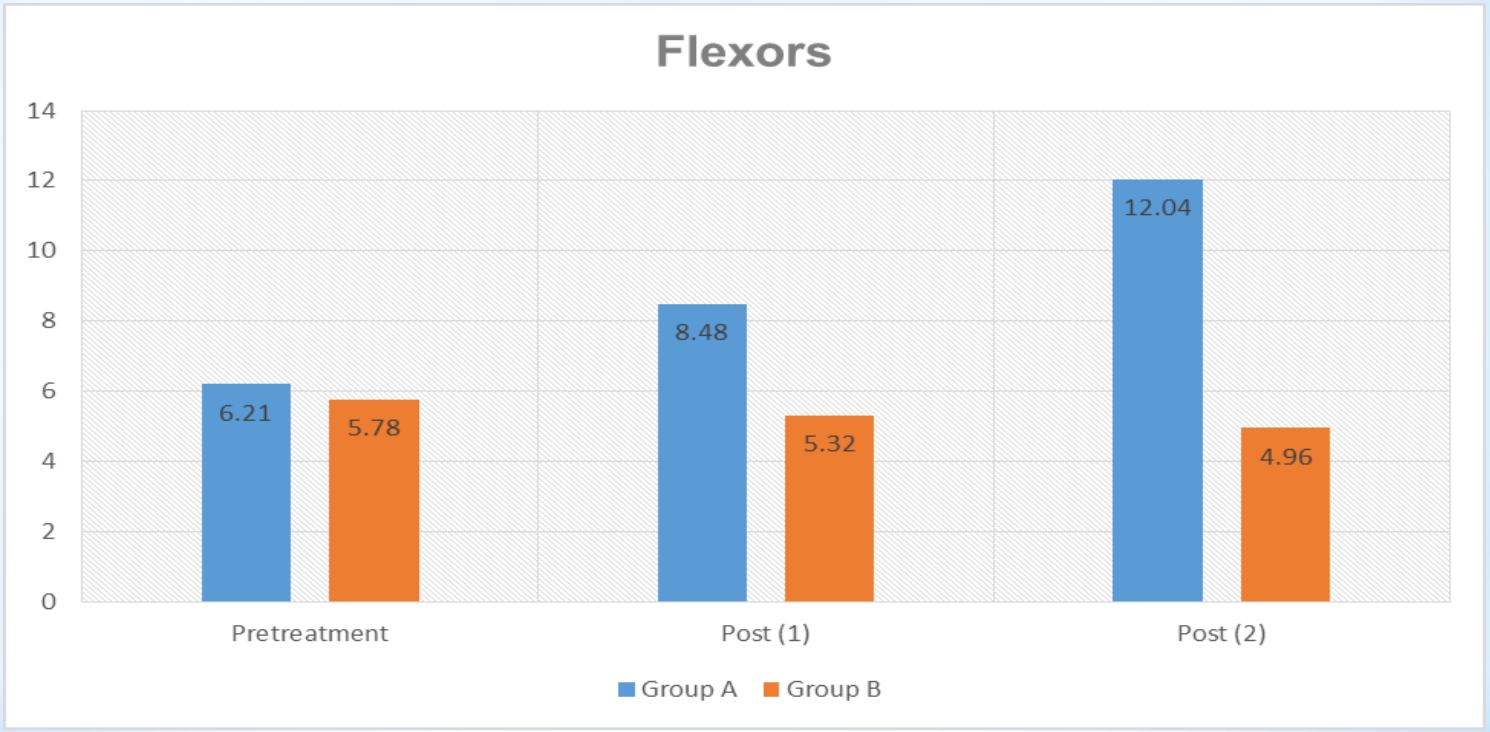
There was no significant difference between both groups at pre treatment measurement while there was significant difference between both groups at post 1and post 2 respectively

2) Muscle strength in the left elbow extensors:



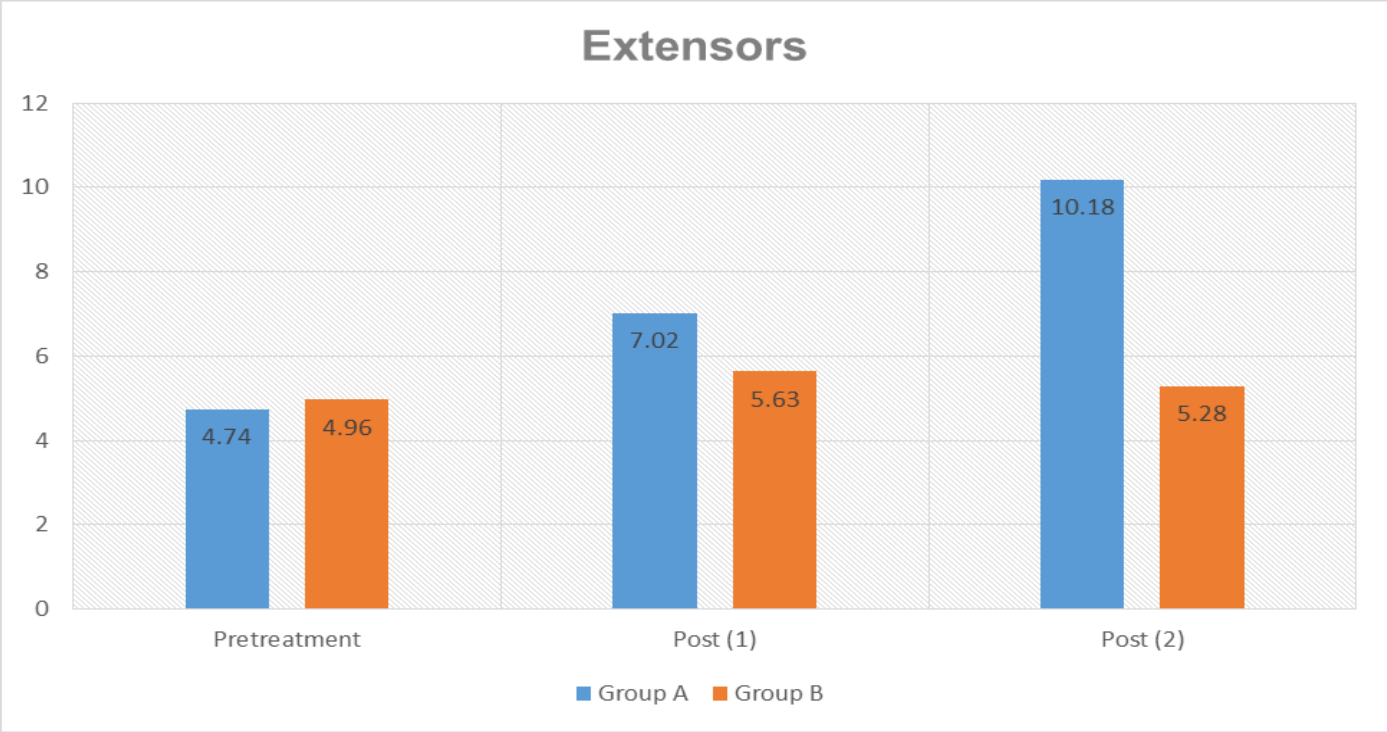
There was no significant difference between both groups at pre treatment with while there was significant difference between both groups at post 1and post 2 respectively

3) Muscle strength in the rigth elbow flexors:



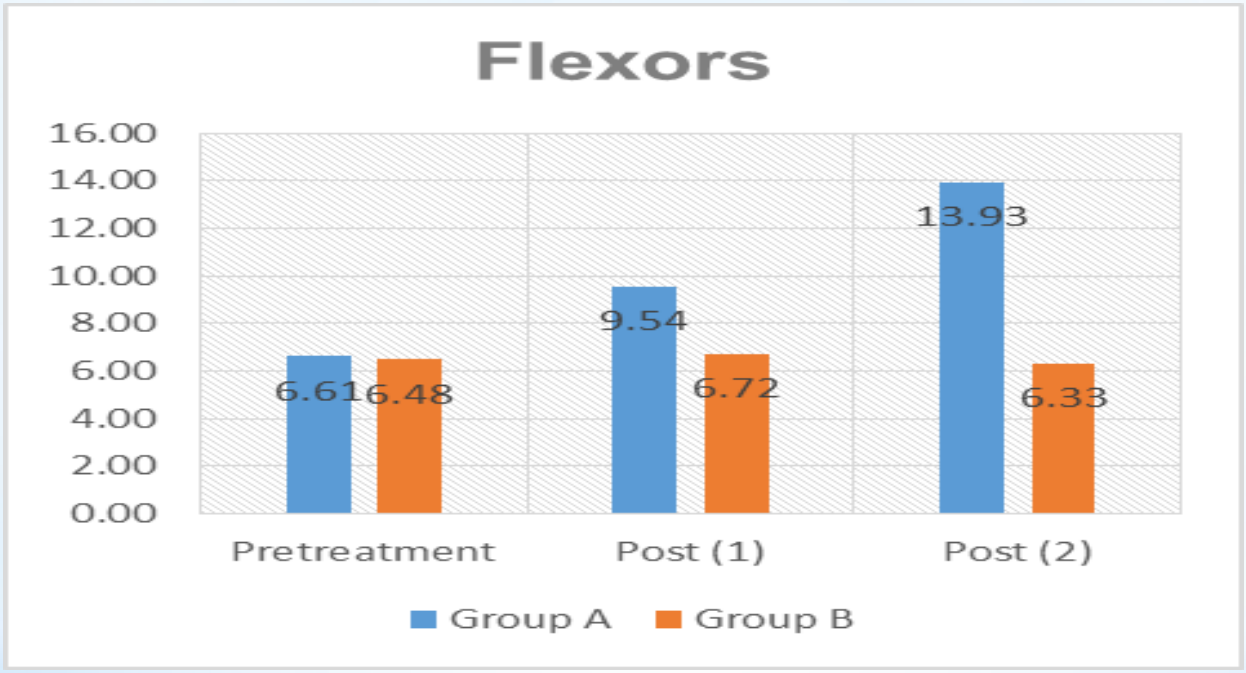
There were significant increase in the mean value of the right elbow flexors muscle strength among the training periods (pre vs. post 1,pre vs. post 2 and post 1 vs. post 2) in group A . There was no significant difference between (pre versus post 1, pre versus post 2 and post 1 versus post 2) in group (B) respectively

4) Muscle strength in the rigth elbow extensors:



there was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively

5) Muscle strength in the left shoulder flexors:

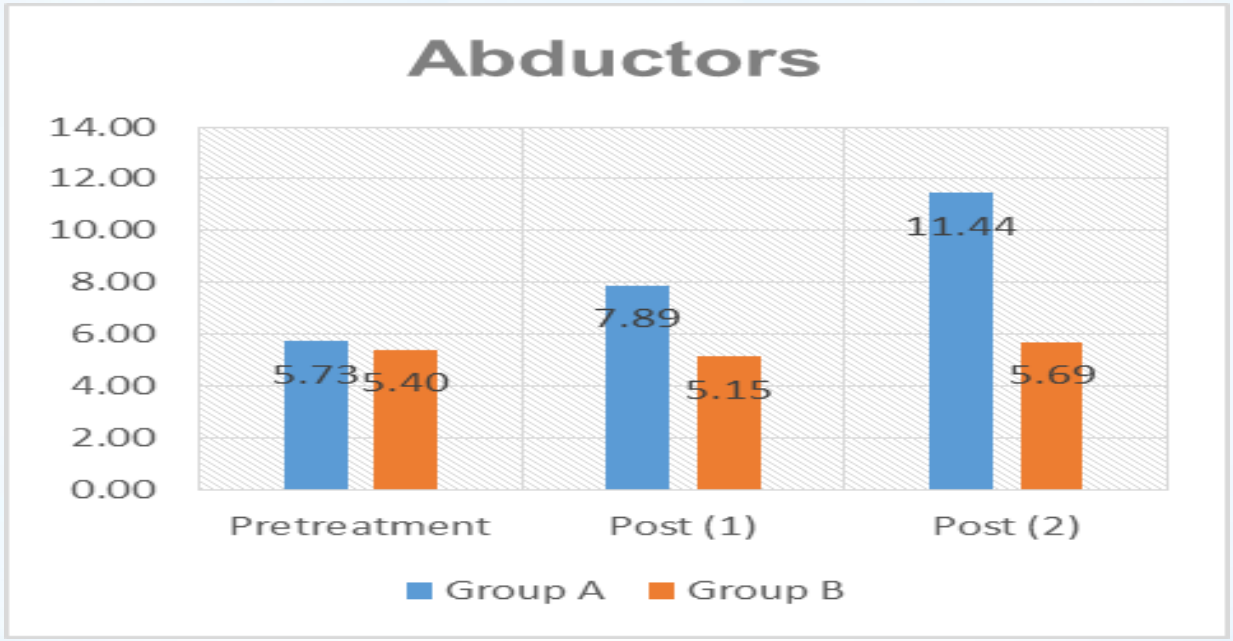


There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively

6) Muscle strength in the left shoulder extensors:

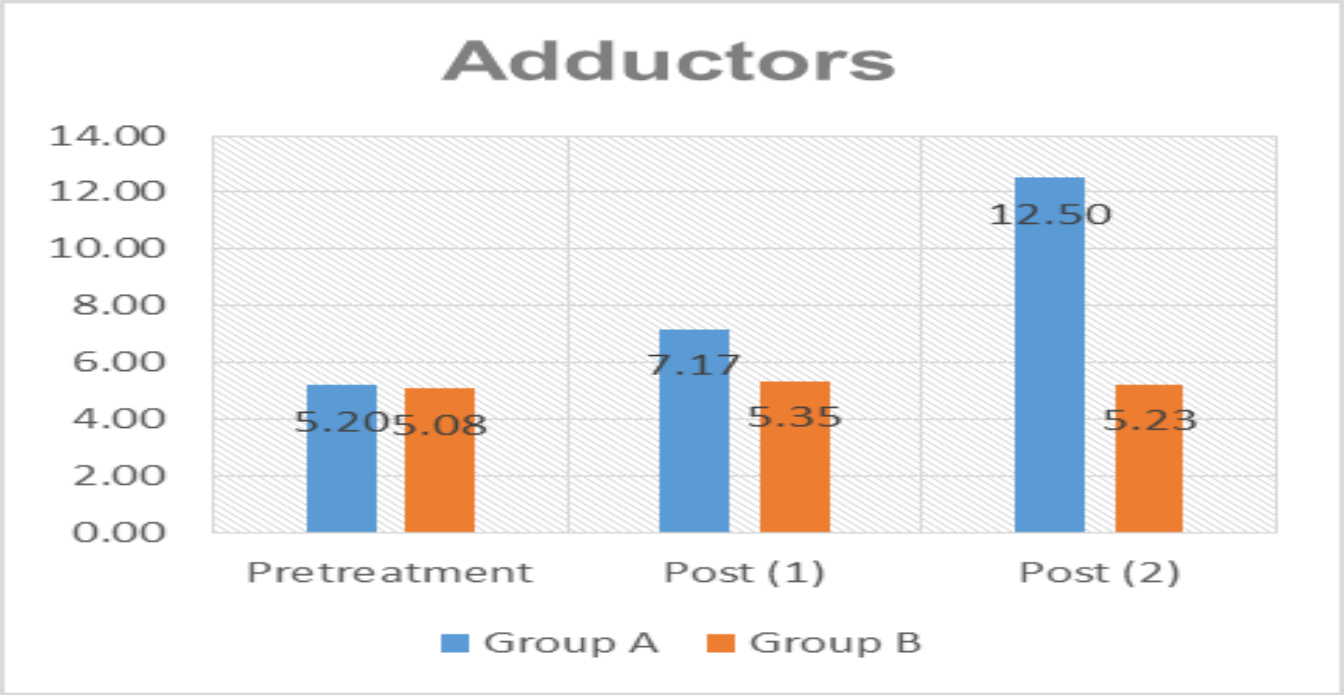
There was no significant difference between both groups at pre treatment and post 1 respectively while there was significant difference between both groups at post 2

7) Muscle strength in the left shoulder abductors:



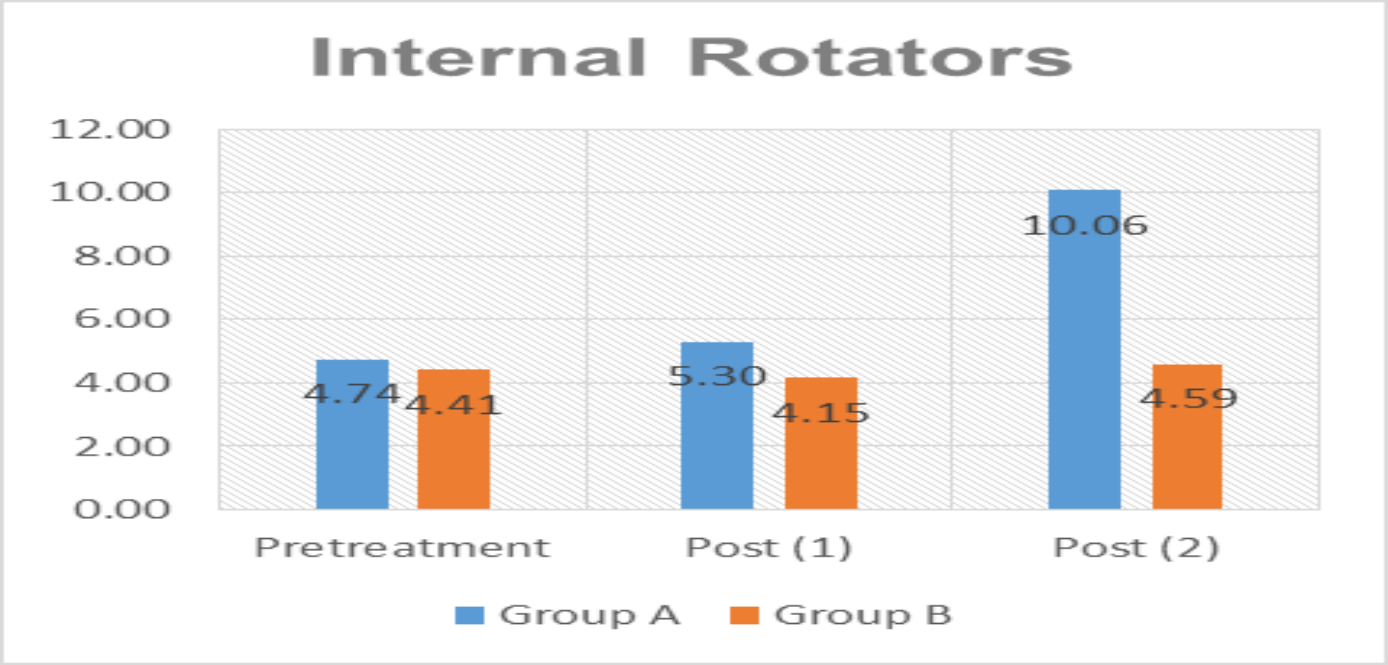
There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively

8) Muscle strength in the left shoulder adductors:



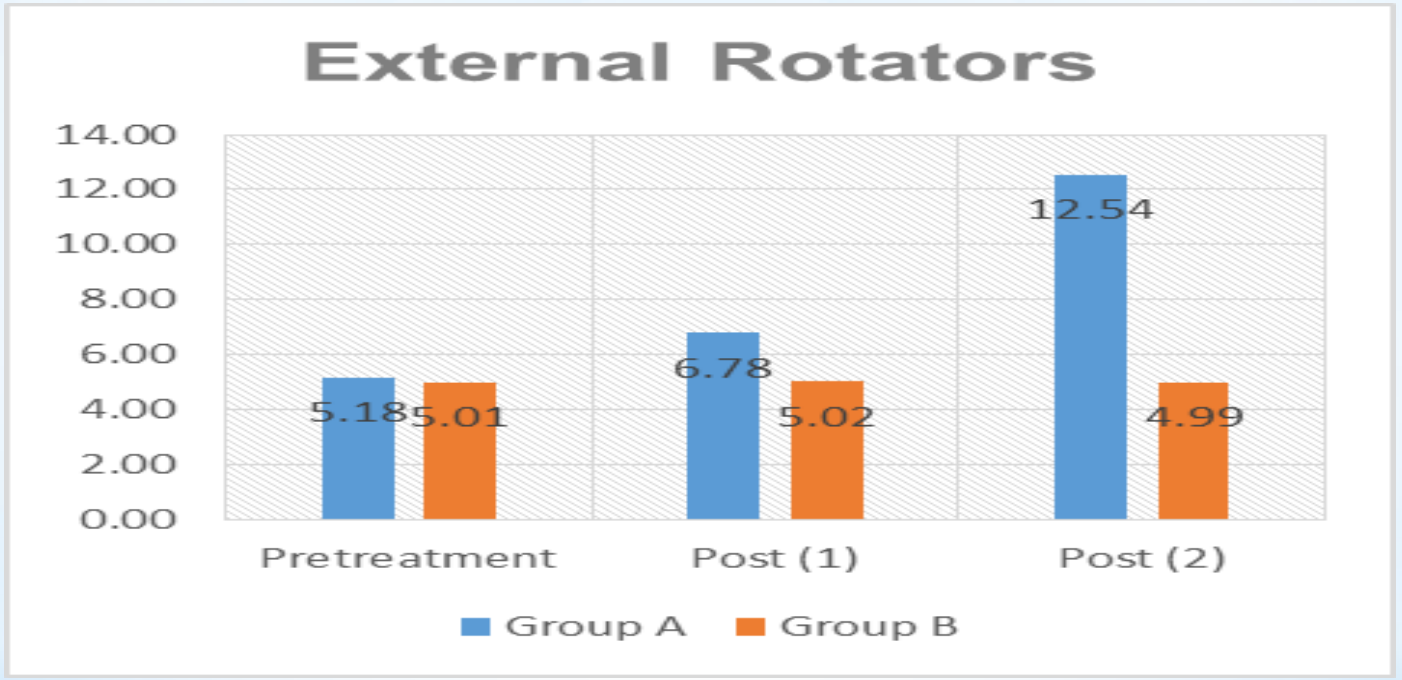
There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively

9) Muscle strength in the left shoulder internal rotators:



There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively

10) Muscle strength in the left shoulder external rotators:

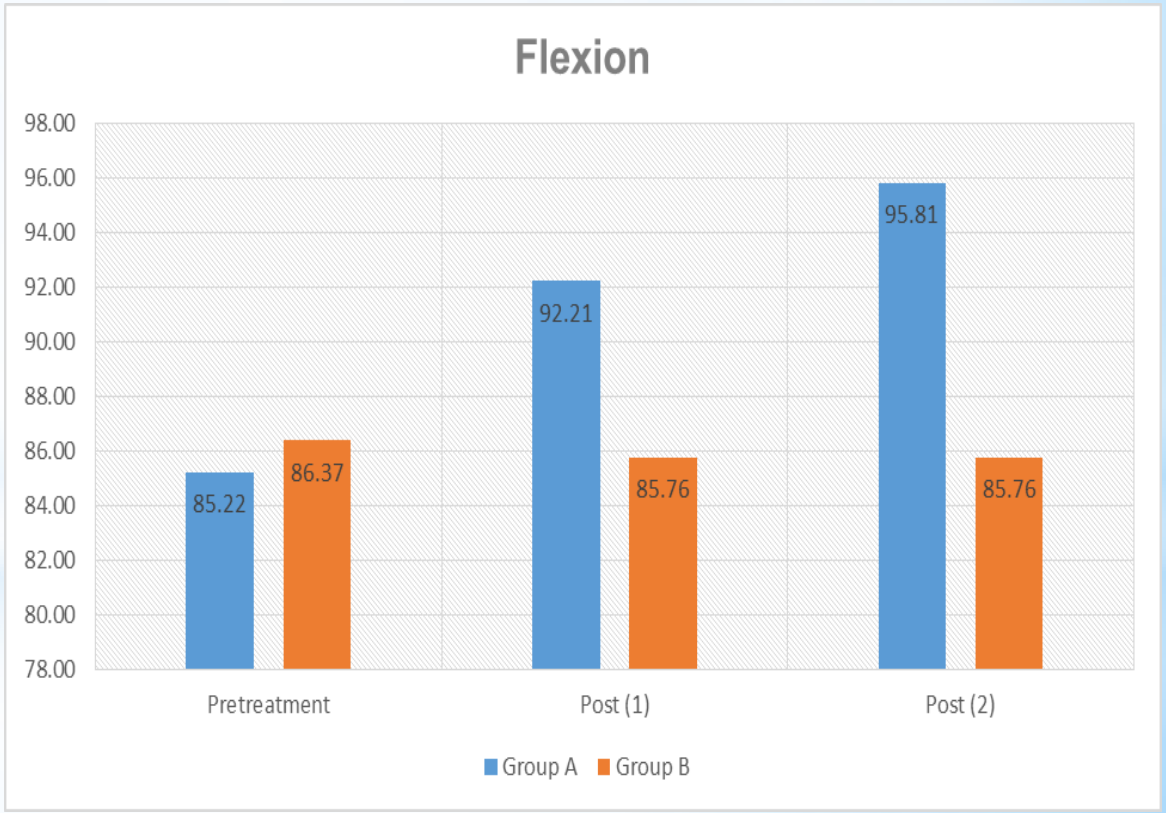


There was no significant difference between both groups at pre treatment and post 1 respectively while there was significant difference between both groups at post 2

ROM

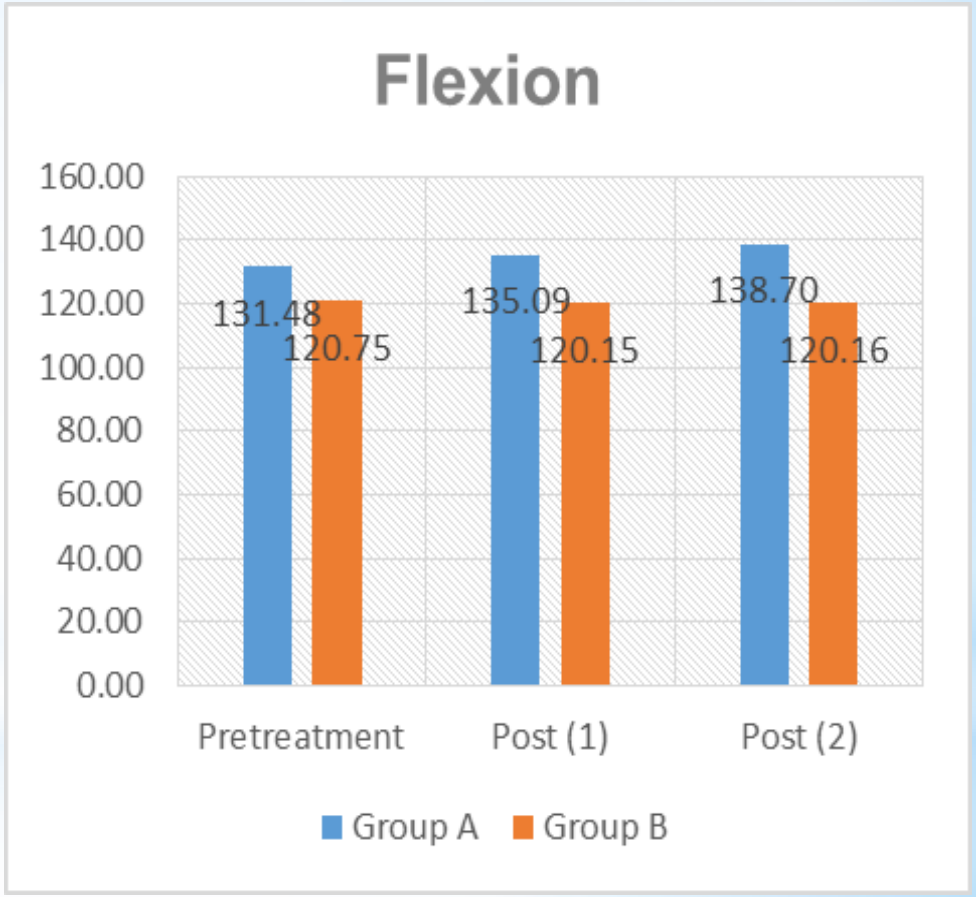
1)The left elbow flexion ROM:

There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively.



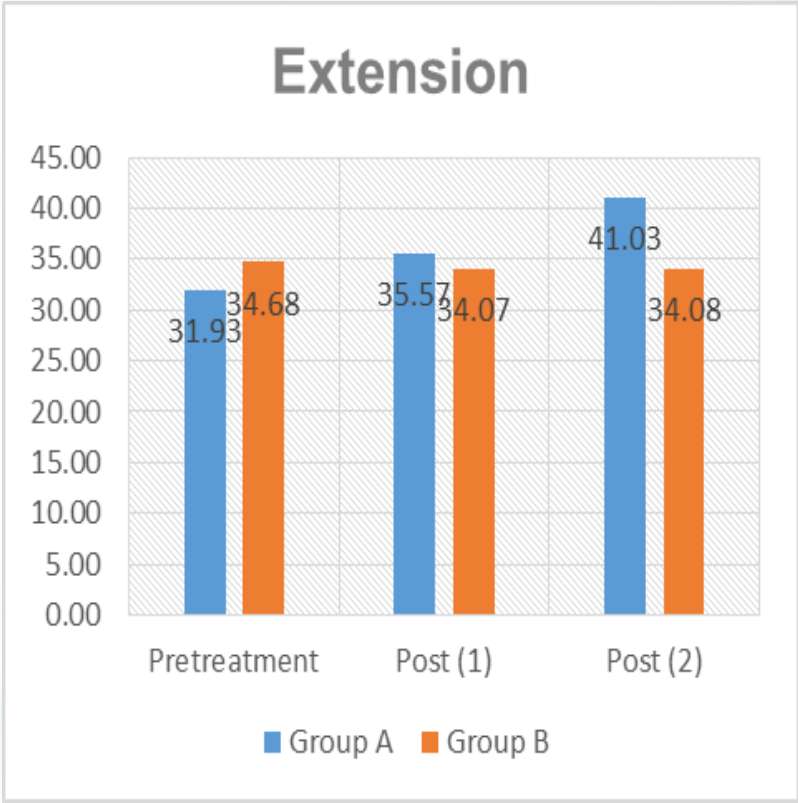
2)The left shoulder flexion ROM:

There was no significant difference between both groups at pre treatment and post 1 respectively while there was significant difference between both groups at post 2



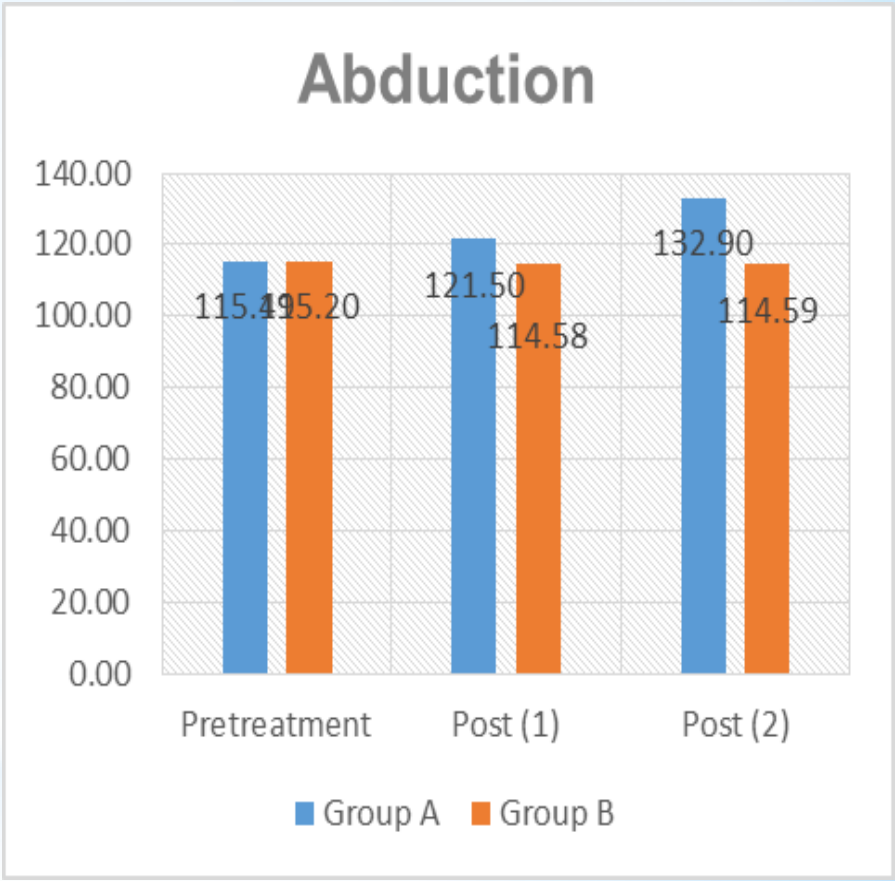
3)The left shoulder extension ROM:

There was no significant difference between both groups at pre treatment there was significant difference between both groups at post 1and post 2 respectively



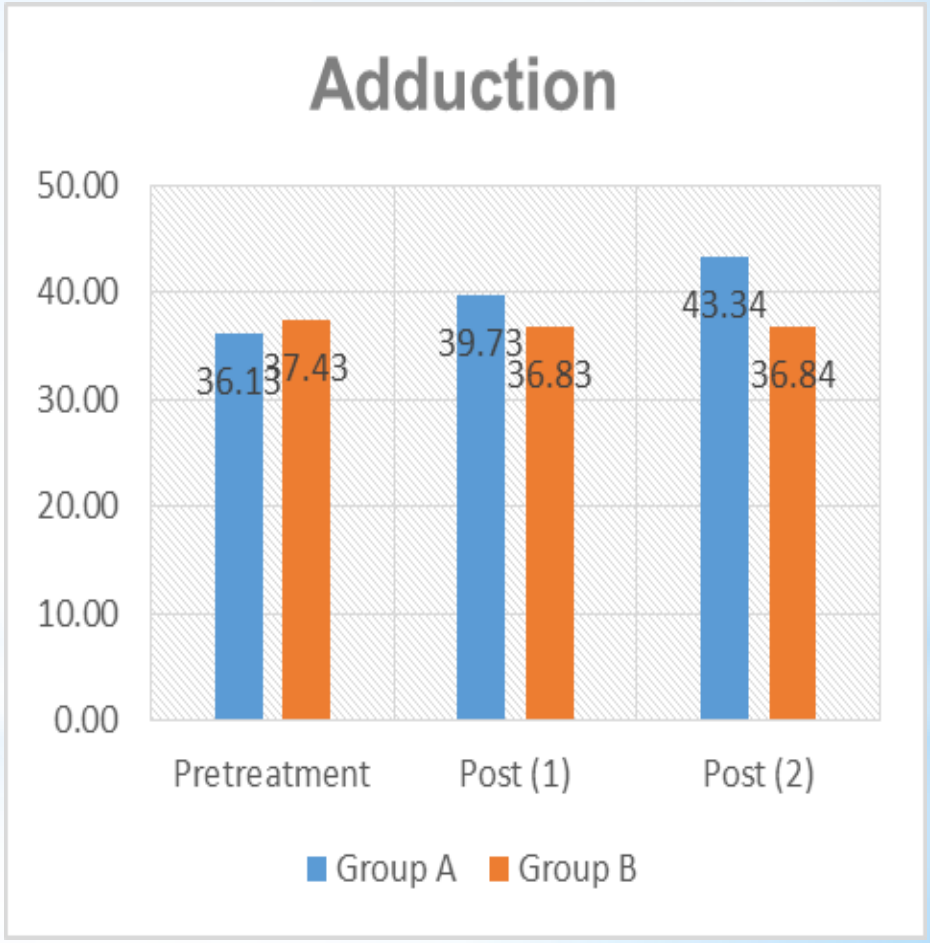
4)The left shoulder abduction ROM:

There was no significant difference between both groups at pre treatment and post 1respectively while there was significant difference between both groups at post 2



5)The left shoulder adduction ROM:

There was no significant difference between both groups at pre treatment while there was significant difference between both groups at post 1and post 2 respectively.



Discussion

This study was conducted to determine the efficacy of
The parameters investigated in this study involved ROM using electronic Goniometer and muscle power using hand held dynamometer of the Upper limb joints

the study was conducted on thirty post renal transplantation patients of Males selected randomly from out patient clinic of Mansoura urology and nephrology center (UNC)

Patient's ages ranged from 20-50 years

The patients were randomly divided into two equal groups in number

group (A) (Training group)

consisted of fifteen post renal transplantation patients received

aerobic exercise using Orbitrek for 8 weeks.

The second group is the group (B) (controlle group). In this group, fifteen post renal transplantation patients received medication only and not received aerobic exercise for 8 weeks.

The findings of the present study showed that there was significant increase in the post2 treatment mean values of all measured muscle strength in elbow, shoulder and wrist muscles in the Exercises Group (Group A) when compared to pre-treatment mean values ($P < 0.005$). In the same group there was significant increase in the post2 treatment mean values of all measured joints ROM ($P > 0.005$).

Regarding the results of group (B) there was no significant increase in both muscle strength or ROM in comparison to pre-treatment mean values ($P < 0.005$).

Comparison between the means of the pre-treatment records of both groups showed that there was non-significant difference in the measures muscle strength or ROM with ($P > 0.05$).

While comparison between the means of the post2 treatment values of the muscle strength and ROM in the both groups revealed that there was a significant difference in the post2-treatment records between the exercise group (group A) and Ordinary Therapy Regimen (group B) ($P <0.001$) with better improvement in exercises group (group A).

CONCLUSION

Orbitrak aerobic exercises had valuable effects in improving ROM and muscle strength of upper limb in patients after renal transplantation.

Recommendations

- The aerobic exercises should be recommended in patients after renal transplantation are needed.
- A similar study should be conducted with other physical therapy modalities for patients with limitation of ROM and muscle weakness after renal transplantation.
- A similar study should be conducted on other patients with limitation of ROM and muscle weakness of lower limb after renal transplantation.
- Further studies should be undertaken the effect of aerobic exercises on immunity after renal transplantation.
- Further studies should be undertaken to a large number of patients providing better statistical analysis of data.
- Further researches should be extended for a longer period than 2 months.

Thank you