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Effect of Weight Bearing Exercises in Patients Diagnosed with Patello-femoral Pain Syndrome

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Introduction

Patellofemoral pain can occur in one or both knees, is most common cause of knee pain. Patellofemoral pain syndrome is a term used to describe the pain behind or around the knee cap (called the "patella") resulting from the problems of the Patellofemoral joint. Overuse and overload by repeated bending of the knee or other weight bearing activity that may increase the pressure between the knee cap and thigh irritating the under surface of the knee cap (articular cartilage), leading to wear and tear and causing great pain. Training errors and repeated weight bearing impact may be contributing factor, particularly in athletes. Steps, hills and uneven surfaces tend to exacerbate Patellofemoral pain. Individuals may have a muscle imbalance or alignment problem (flat feet and knock knees) of the lower limbs causing the abnormal gliding of knee cap within the groove of the knee.

There are three stages of Patellofemoral pain syndrome:-

1. Acute stage/ severe condition.
2. Sub-acute stage/ moderate condition.
3. Settled stage/ mild condition.

Aim

To study effect of weight bearing rehabilitation programme in patient, diagnosed with Patello-femoral pain.

Objectives

1. Create awareness about the Patellofemoral pain and disability.
2. Encourage weight bearing activities.

Material and Methodology

Study design - Interventional study.
Study setting - participants were from the Orthopaedic outpatient department.
Sample size – 50 patients diagnosed with patellofemoral pain were selected with simple random sampling technique. Voluntary participation with consent and study explanation done.
Inclusion criteria -

1. Patients with history of anterior, retro or peripatellar pain that was readily reproducible during atleast two of the following activities within last one month.
   - Ascending and descending the stairs,
   - Hopping/ running,
   - Squatting,
   - Prolong sitting.
2. Insidious or sudden onset of symptoms not related to trauma.

3. Palpatory pain on patellar facets.
4. Age group 20-50 years.
5. Both genders.

Exclusion criteria-

1. Ligamentous pathology around knee.
2. Patellar tendinitis.
3. Joint effusion.
4. Post Knee surgery.
5. Patellar subluxation or dislocation.
6. Significant injury affecting other lower extremity joint.
7. Tibio femoral osteoarthritis of knee.

Duration of the study-

Study conducted during the period of August 2009 to August 2010 and the patients were for 6 weeks under the treatment.

Outcome measures-

- Primary outcome - Visual analogue scale [VAS].
- Secondary outcome measure - Patellofemoral joint evaluation scale for measuring the disability.
- The patients were observed for 7 points which were limp, assistive devices, difficulty in stair climbing, crepitation, inability "giving away", swelling, pain.
- Then the patients were graded as
  - Excellent 90-100 points,
  - Good 80-89,
  - Fair 60-79,
  - Poor <60 points out of total score of 100.

Procedure –

- The physical examination of each patient were conducted and they were randomly allocated to group A and B. Group A patients were given weight bearing rehabilitation program with conventional treatment.

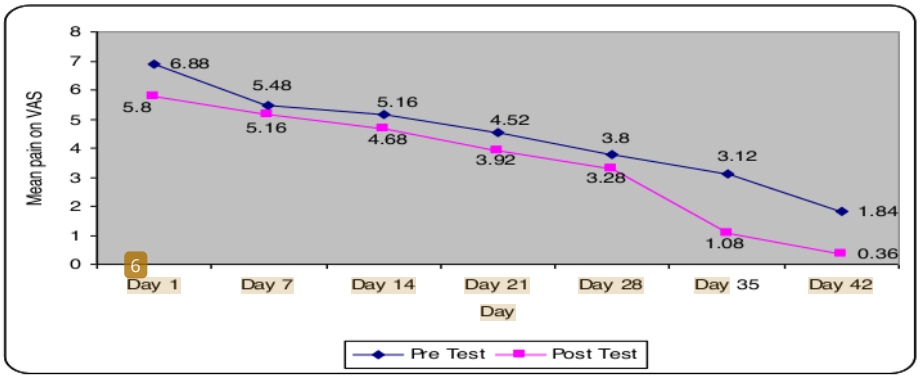
Activity	Duration
Stretches (All sessions) ● Sitting hamstring stretch ● Standing quadriceps stretch ● Standing calf stretch	5 repetitions/ 20 sec hold
Week 1 Exercises ● Wall slides (0°-40° knee flexion) ● Lateral step downs off 4-in step ● Single-leg heel raises ● Theraband front pull (subjects perform a single-leg stance on injured limb and perform standing, resisted hip flexion with the contralateral limb)	15 repetitions/ 5 sec hold 3 sets of 10 repetitions
Week 2 Exercises ● Wall slides (0°-40° knee flexion) with Theraband resistance around knees ● Single-leg heel raises on balance pad ● Lateral step down off 6-in step ●Theraband diagonal pull (perform a single-leg stance on injured limb and perform standing resisted hip flexion in a diagonal pattern)	15 repetitions/ 5 sec hold 3 sets of 10 repetitions
Week 3 Exercises ● Wall slides (0°-40° knee flexion) standing on balance pad with Theraband resistance around knees ● Mini-squat (0°-30° knee flexion) ● Lateral step down off 4-in step with Theraband resistance	15 repetitions/ 5 sec hold 3 sets of 10 repetitions

behind knee pulling anteriorly ●Single-leg stance on balance pad bouncing ball off wall	3 sets of 20 ball tosses
Week 4 Exercises ● Mini-squat (0°-30° of knee flexion) on balance pad ● Lateral step down off 6-in step with Theraband resistance behind knee pulling anteriorly ● Backward walk with Theraband resistance around ankles (subjects stand with slight knee flexion and take steps backward with resistance between ankles) ● Forward lunges onto 8-in step without push-off (subjects lunge onto 8-in step to 40° of knee flexion)	3 sets of 10 repetitions
Week 5 Exercises ● Single-leg mini-squat (0°-30° of knee flexion) ● Lateral step down off 4-in step standing on balance pad with Theraband resistance behind knee pulling anteriorly ● Side stepping with Theraband resistance around ankles (stand with slight knee flexion and take steps laterally with resistance between ankles) ● Forward lunges onto 8-in step with push-off (lunge onto step 40° of knee flexion and push off to starting position)	3 sets of 10 repetitions 3 sets of 10 repetitions
Week 6 Exercises ● Single-leg mini-squat (0°-30° of knee flexion) standing on balance pad ● Lateral step down off 6-in step standing on balance pad with Theraband resistance behind knee pulling anteriorly ● Monster walks with Theraband resistance around ankles (stand with 30° of knee flexion and walk forward with resistance between ankles) ● Forward lunge to ground level (lunge on level surface to 40° of knee flexion) to left and right	3 sets of 10 repetitions 3 sets of 10 repetitions

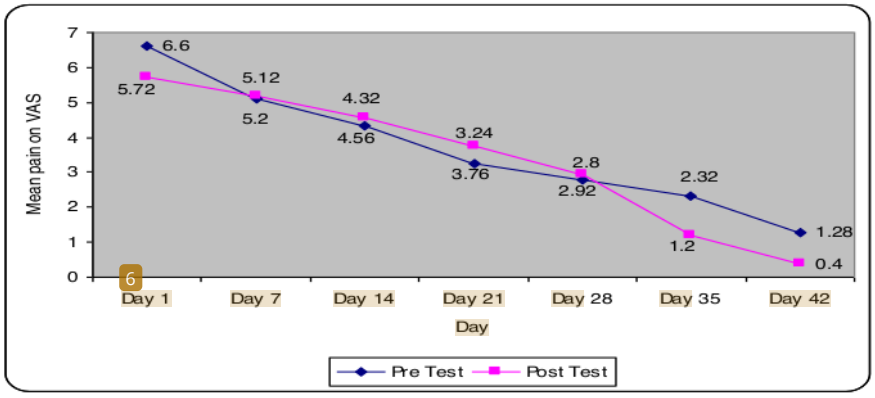
- Group B patients were conventional treatment in the form of hot fomentation, quadriceps exercises starting with isometric quadricep exercises and later dynamic quadricep exercises as a progression.
- Patients were assessed on Day "1st, 7th, 14th, 21st, 28th, 35th, 42nd "for pain on VAS, PFEJS score and knee flexion ROM.
- The observations were recorded and the results were statistically analysed.

Data Analysis

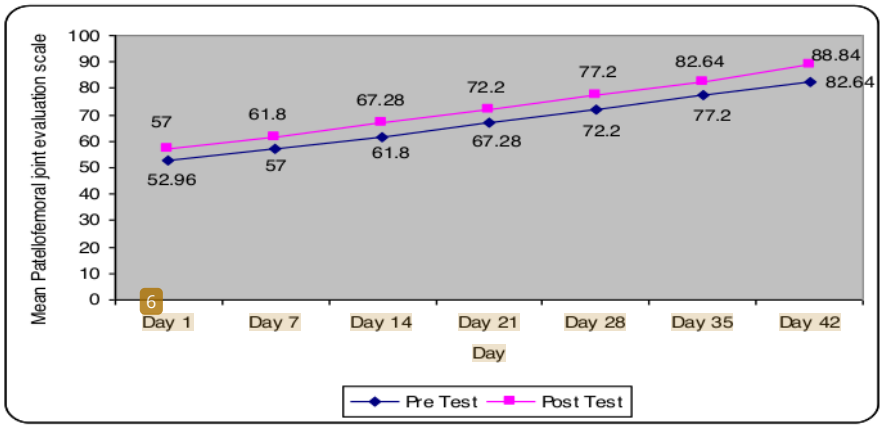
- Comparison of pain on VAS in Group A pre and post test



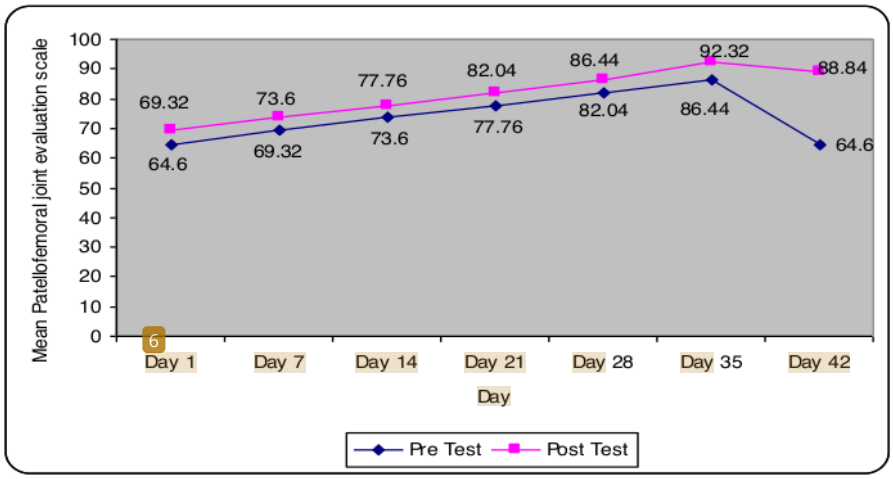
- Comparison of pain on VAS in Group B pre and post test



- Comparison of Patellofemoral joint evaluation scale in Group A pre and post test



- Comparison of Patellofemoral joint evaluation scale in Group B pre and post test



Result and Conclusion

1. This study is suggestive of the weight bearing rehabilitation programs can be effectively used in case of the patients with Patellofemoral pain.
2. We also found that due to participation in weight bearing activities the ADLs of the patients found to be less affected.
3. Hence, the weight bearing program in the form of closed chain exercises can be practice regularly in physiotherapy for encouragement of patients towards weight bearing activities.
4. From the study it is found that age doesn't show any difference in pain and the reduction in knee ROM with respect to age.

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