effect of pilates training on osteoarthritis knee‘s proprioception function.

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Abstract: Introduction- In OA knee patient proprioception was major problem like difficulty in walking, balance activity. Pilates training is group exercise program like stretching , isometric ,flexibility. In this study to determine Pilates training useful in OA knee ‘s proprioception function.

Method- 10 patient who had OA knee participated in this study. 1 week Pilates training before and after taken knee prorrioception function by use of joint reset angle method.

Result - Pre WB mean and SD was 26.97±2.35,post WB mean and SD was 25.41±3.16 and pre NWB mean and SD was 30.89±0.97,post NWB mean and SD was 30.34±0.31. Their was statistically significance p=0.05 in pre and post parameters.

Discussion- Pilates exercise is powerful exercise for proprioception training. It is low-impact exercise to strengthen the muscles and supportive structures of the knee, and improving mechanics and loading patterns. it is also very helpful in walking and gait pattern in osteoarthritis knee patient.

Conclusion- knee proprioception was significantly improve before and after pilates training.

Keywords- Pilates, Osteoarthritis knee, Proprioception, joint reset angle method.

Introduction

Osteoarthritis (OA) is a common, slowly progressing condition affecting the synovial joints. It’s thought to be a chronic, progressive, degenerative disorder affecting the synovial joints. It is a common age associated locomotor illness of the developing countries which predominantly cause degeneration of hyaline cartilage, and its symptoms occur more often in the weight bearing joints of the lower extremities. The knee joints are the largest joints most frequently affected by this condition.[1]

OA leads to the loss and degradation of articular cartilage [2]. This loss of cartilage can disrupt the normal mechanics of the joint, leading to altered proprioceptive feedback. OA is associated with joint inflammation, leading to increased joint fluid and swelling [3]. Swollen joints can alter the position and perception of the joint, affecting proprioception. OA can also affect the ligaments and tendons surrounding the joint [4]. These structures are rich in mechanoreceptors and provide important proprioceptive input. Damage to ligaments and tendons in OA can impair proprioception. As OA progresses, there might be muscle weakness and atrophy around the affected joint [5]. Muscles play a vital role in proprioception, as they sense changes in muscle length and tension. The weakness or dysfunction of muscles can negatively impact proprioceptive function. Chronic pain is a common symptom of OA [6]. Pain can interfere with the brain’s ability to interpret proprioceptive signals correctly, leading to diminished proprioceptive awareness.

Pilates emphasized posture as an integrated whole-body activity. Muscles not primary to the movement pattern remain actively engaged and in alignment with each exercise. This concept exemplifies muscle integration in lieu of isolation and illustrates an application of the regional interdependency approach. Total leg strengthening, total arm strengthening, and total core strengthening capitalize on the radiation concept, whereby weaker muscles are facilitated by the stronger ones in the movement pattern.[7]

In this study, we discussed about knee Proprioception will affect use of Pilates training. In a recent scenario knee proprioception always affect in osteoarthritis knee and total knee replacement patient.

Method
Ten Osteoarthritis Patients age group between 40 to 50 years were included in this study. The subjects with recent trauma or surgery of the knee, pain or musculoskeletal deformity involving the knee were excluded from the study. Plinth and Velcro straps were used in study. Joint range was measured with a universal Goniometer. With use of universal goniometer taken joint resent angle. Pre and post of Pilates training measured joint resent angle to check proprioception use of outcome measure.8

In Pilates training, patients performed one leg circle, curl-up, single leg stretch, criss-cross, side kick, side passé, side inner thigh, shoulder bridge, side kick bicycle, and leg pull (prone). All exercise performed in above same sequence two set, three weeks/day. After three weeks of Pilates training again measured joint reset angle for proprioception measurement.

Result

Pre WB mean and SD was 26.97±2.35, post WB mean and SD was 25.41±3.16 and pre NWB mean and SD was 30.89±0.97, post NWB mean and SD was 30.34±0.31. Data was not normally distributed. Wilcoxon t-test was applied for data significance level. Their was statistically significance p=0.05 in pre and post parameters. Results showed that was significant difference in pre and post results. Pilates training is helpful in osteoarthritis patient in proprioception function.

Discussion

Researchers9,10 have summarized the evidence on the efficacy of proprioceptive or proprioceptive-type training for knee OA. Pilates exercise program have been reported to be one of the non-pharmacologic approaches for managing knee osteoarthritis. Pilates exercise program was capable of reducing pain and improving knee functional performance for chronic (OA) patients with the same opinion of Mazloum et al., (2018) who had made a trial to detect the effect of conventional therapeutic exercises and Pilates on pain and function in patients with knee osteoarthritis. He found that both conventional therapeutic exercises and Pilates exercise program had a remarkable improvement on pain and function with a favor to the patient who participated in Pilates exercise program.11

Khan et al., 2018 reported that, A 2-week Pilates treatment intervention was more efficacious than conventional care in reducing pain intensity, functional disability levels, anxiety and depression but statistical difference was only in terms of NPRS due to small sample size and age variation in terms of accessible population. Pilates has many benefits that may affect Knee function such as improving core strength, and increasing flexibility, circulation and balance.12

In an osteoarthritic joint, IL-1B induces the release of prostaglandins and nitrous oxide, which ultimately results in reduced proteoglycan synthesis and reduced extracellular cartilage matrix. Chowdhury and colleagues showed that dynamic compression of chondrocytes actually counteracts this release of prostaglandins and nitrous oxide.48 Thus, it is suggested that dynamic mechanical compression of the osteoarthritic knee joint may inhibit the inflammatory process.
This compression could be mimicked during therapeutic exercise by performance of exercises that apply a dynamic, physiologic load to the knee joint. This could be achieved for those with knee OA with dynamic WB exercises.\textsuperscript{[13]}

Accordingly, it can be concluded that pilates exercise can improve Proprioception function OA knee (OA) patient which consider the most important manifestations that affect their quality of life. The results of this study rejected the null hypotheses as there was significant Pilates exercise affect proprioceptive function.

Conclusion

In OA Knee patient proprioception function is very important for walking, sit to stand like daily activity. Pilates exercise is very helpful in proprioception function. In OA knee patient treatment protocol use Pilates exercise.

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References


