

Evidence Based Physical Therapy Approach to Anterior Knee Pain

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Received: April 13, 2019; Published: May 28, 2019

Abstract

Introduction: Anterior knee pain or patellofemoral pain is a common complaint presented in both athletes and non-athletes population, it is usually presented as non-traumatic patellar pain that affects patients' activities and life quality. It is diagnosed through both clinical and laboratory investigations, however, special care is exhibited for clinical and physical examination which should be done for diagnosis and statement of patient's problems and specific causes that initiate these conditions, also to set the goals and general guidelines for therapeutic plans. Rehabilitation plan and process should regard for prevention, complication and recurrence of the conditions, individualization is an important principle during goal setup and planning the rehabilitation process. The rehabilitation process should be based on standard evidence-based guidelines for achieving goals in proper manner and timing. Application of evidence-based approaches helps the clinician to avoid medical errors and aids to systemize the therapeutic approaches.

Methods: A search process was conducted for the current evidence in published papers. Using valid keywords to optimize our search result within the evidences published in English with last 5 years.

Conclusion: Evidences available for using bracing, taping, strengthening exercises with low level evidence for TEN and NMS.

Keywords: Anterior Knee Pain; Patellofemoral Pain; Physical Therapy; Rehabilitation

Introduction

Musculoskeletal pain is a very common complaint in both sexes which directly affects life quality, productivity and general health conditions [1]. Patellofemoral pain or AKP is a common musculoskeletal pain; the cause of developing anterior knee pain could be due to various causes such as history of trauma [2], inflammatory diseases [3] or other articular disorders [4]. It looks like to be due to multi-factorial causes [5]. Although some risk factors might be responsible for this condition, as imbalanced diet, lack or over physical activities seem to be among factors that increase the incidence of idiopathic AKP.

Patellofemoral pain contributed to structural and functional changes, these include also mechanical properties of ligaments and other structural tissues which reflect the importance of multi-dimensional approaches for during therapeutic approaches [6]. Considering the individualization of therapeutic modalities, goals and timing due to individual differences of patients' category problems, complaints and needs. Population category is a valuable factor as elders differ from adolescents and also athletes are not the same for non-athletes [7].

Pain-free individuals have a better quality of life than those who are suffering from pain, so a patient with PFP is expected to have impaired life quality. Physical therapy and enhancement of physical activities have a positive effect on level of life quality [8]. Pain is not only affecting the physical abilities but also found to interfere with the psychological status of patients which increases the impact on life quality [9].

Review

Anterior knee pain is defined as "anterior knee pain defined as pain at the anterior of the knee with the activity of going up and down stairs or changing position. We defined anterior knee pain when the patient felt disturbing pain, which affected daily life activity" [10].

Older chronological age, female, increased body mass index, previous knee injury, heavy workload, and repetitive kneeling or squatting activities have been proposed as risk factors for the clinical syndrome of patellar chondromalacia or articular cartilage defects [11].

Old Age could be one of risk factors as it frequently diagnosed in age (50 - 59 years) [12], sometimes present as a common complication post anterior cruciate ligament reconstruction in young adults [13]. Females expected to have (AKP) more than males [14]. Increased body mass index is among the dangerous factors that could cause or being a predictor for (AKP) [15]. Individuals who have past history of knee injuries are commonly complain of AKP [16], other factors as improper activities, heavy workload and prolonged positioning; (like kneeling or squatting activities) [11].

A review for statement of evidence based physical therapy approaches for AKP using the available published evidences using Google Scholar, Pub Med and Science Direct from 2014 till 2019, published in English languages. Evidences from clinical trials and other reviews are accepted. Searching words includes physical therapy approaches, evidences based physical therapy approaches, physical therapy modalities, efficacy, anterior knee pain and patellofemoral pain. In systematic review the reviewer should processed an appraisal process with standard documented appraisal tool but that process not conducted with our review.

A diagnosis process considered as a primary classification of patients according which disorder they might have, although the assumption is that identifying individuals with disease optimizes their outcome, is not always be justified [17]. To state the Diagnosis of AKP, it is important to Utilize of clinical data such as patient's clinical history and physical examination that supported with other clinical tools and investigations as imaging. This process mainly aim to establish the underlying conditions that cause the AKP which finally enhance proper therapeutic approach and planning [18].

Physical examination should be done properly to prevent medical errors is that causes unneeded and adverse events in medical care [19], adequate physical examination for knee joint should include other structures related to knee joint or may affect its function as related joint, ligaments and other articular components. Functional indicators of these structures also should be examined as physical status [20].

Clinical examination is a process done for detecting and document any abnormalities or disorders. Clinical examination and evaluation for AKP include evaluation of pain, range of motion, muscles testing articular assessment, postural control and balance. Functional test and special tests for function assessment should be included as stairs climbing test, 6 mints walk test and site to stand test [21].

However, every case may present with specific clinical picture according to its causes and underlying pathology, there are some common clinical problems associated with AKP. These may include a mechanical pain located in the anterior region of the knee, which aggravated with physical activities and decreased with rest [18], instability problems (patellar instability), muscular problems; may include weakness, hypotrophy and muscles imbalance (quadriceps muscle weakness, hypotrophy and hypo- activity of the vastus medialis, imbalance between vastus medialis and vastus lateralis) and gait problems [22].

Rehabilitation should processed through stages with defined goals to achieve both short term and long-term goals, one of most important principle during designing rehabilitation program is the individualization of program to meet the every patient's need and solves the special problems that present. Prioritizing application of each modality according to evidence based and timing rules according to the current stage, that patient is experiences, as general rule to enhance rapid healing or repair, prevention of any further problem and return to normal life style with regarding patients special considerations occupation, athlete or not, etc.

Rehabilitation processes classified into three phases, which are the acute phase, the Sub acute (intermediate) phase and the chronic or return to sport phase. fourth phase might added which is advance strengthening phase that may conserve as transit phase in-between the Sub acute (intermediate) phase and the chronic or return to sport phase. Rehabilitative phases are designed to facilitate achieving goals and solving problems which are expected and aid in clinical decision making regarding timing systematic progress focusing on both patient's reported problems and stated problems by the clinician as part of clinical examination and evaluation which help in a proper therapeutic approach [23].

Discussion

Acute phase of Rehabilitation contribute to manage or control the problems and complains that patient commonly present with acute phase as pain, inflammation, range of motion limitation, decreased muscles strength and flexibility. In the Sub-acute (intermediate) phase patient is being prepared to move from limited motion and protected activities to more complex and ordinary movement with ensure that subsidence of inflammation, pain free movement and unlimited daily living activates. the chronic or return to sport phase characterized by initiation of specific tasks and special needs to full recover and return to the normal activities before injuries [24].

Patellofemoral or AKP syndrome which may be more beneficial to manage with multimodal program for decreasing pain and maximal restoration of functional activities, one of most prioritized aimed is to decrease pain as it may causes interrupted daily living activities, limitation to movement and even occupational defects. Multimodal approach; using therapeutic exercise with adjuvant of taping and braces have very strong support to be implemented in such cases [24].

A pilot study disagree with implication of exercises therapy and taping techniques in treating of adolescents with patellofemoral pain due to poor Adherence to the exercise therapy in this population category but still the efficacy of the modality itself has other evidences support. As the causes related to un-adherence of adolescents to exercises programs, other studies recommended investigating how to enhance adolescents to improve their Adherences in exercises therapy and sport practices for good health and activity status [10].

Taping is one of the modalities which started to be used as adjuvant procedure to reduce pain, in clinical practice and during sport training as it has a sensory effect that associated with temporary application which might could modify the knee pain acutely through afferent input blocking nociceptive pain that can provide the enough time to adapt during clinical application of exercise or for sport participants in sport training [2], that improve the patient performance of exercises and timing through decrease the pain during physical activities, there are some evidence recommend to apply large coverage area and use big tape length for enhancing nociceptive effect [25].

Bracing reported to decrease pain in patients with knee pain symptoms [26], as these patients usually suffering from increasing patellofemoral loading, so decreasing loading through bracing could be beneficial [27].

Patients with patellofemoral pain usually presented with knee joint muscles problems includes weakness and mal activation so including muscle strengthening exercisers in beneficial in such case, however there is evidence that patients have additive benefits if hip muscles included in the strengthening program [28]. Other more benefits are suggested by adding myofascial techniques during designing an exercises program for patients' rehabilitation with AKP or patellofemoral pain syndrome [29].

Transcutaneous electrical nerve stimulation (TENS) treatment has recommended for management of pain-induced gait abnormalities in sagittal knee mechanics and effective in pain reduction [30], we are suggest to be added in comprehensive physical therapy program in rehabilitation of patients with patellofemoral pain syndrome but it is strongly recommend for more investigation for more high evidence level also for Neuromuscular electrical stimulation (NMES) [31-33].

Conclusion

Patellofemoral pain or AKP is a common non traumatic pain could be presented with different categories of age and populations; however risk factors include old age, females and individuals with history of knee trauma. Diagnosis process includes imagining studies but the clinical and physical examinations have essential role in establish this diagnosis, it is important not only in diagnosis but in treatment also which discover the clinical problems and statement of therapeutic goals. Rehabilitation process should be standardized, individualized and evidence based processed through well-defined stages that help in achieving goals with proper quality and timing. Physical therapy approaches to anterior knee pain or patellofemoral syndrome have some evidence to include bracing, taping, strengthening exercises for hip and knee joints, myofascial techniques and (TENS). We think it recommend to conduct a systematic review for the efficacy of each modality and with adjuvant to each other, also more clinical trial for the efficacy of electrotherapy modalities in that case and adjuvant with therapeutic exercises.

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Volume 10 Issue 6 June 2019

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