Patellofemoral Pain Syndrome - Contemporary Management Strategies

Konstantinos Papadopoulos

‘Lecturer, Allied and Public Health, Faculty of Medical Science, Anglia Ruskin University, UK

Background

Patellofemoral Pain Syndrome (PFPS) is one of the most common clinical conditions in patients of either sex, all activity levels and ages and is presented as a diffuse, anteriorly of the knee which deteriorates with activities such as squatting, running, kneeling and descending stairs (Rathleff et al., 2013). It is frequently confused with chondromalacia patellae; however, the latter is a pathologic diagnosis and constitutes a distinct cause of knee pain (Sandow & Goodfellow, 1985). Other common synonymous terms include, lateral facet compression syndrome and retropatellar pain syndrome (Cutbill et al., 1997). There are no specific findings on physical exam that are diagnostic of this PFPS problem (Jackson, 2001). This is why a number of clinicians identify this condition by excluding any other knee problems (e.g. menisci, ligaments) (Thomee et al., 1999).

Prevalence and demographics of PFPS

Research conducted in eight general practices in the United Kingdom has shown that AKP represents 12% of all knee-related consultations and 71% of these cases are diagnosed as Patellofemoral Pain Syndrome (PFPS) (Wood et al., 2011). PFPS is thus the second most common musculoskeletal complaint presented to physiotherapists and the most common knee problem physicians must confront (Houghton, 2007; Witvrouw et al., 2015).

In 2000 PFPS was also considered as a post-traumatic complaint after ACL knee surgeries. The incidence of PFPS after ACL surgery with bone-patellar tendon-bone autografts was from 4% to 40% (Fu et al., 2000) whilst the incidence was ranged from 6% to 12.5% 2years post-surgery in hamstring grafts (Aune et al., 2001). These assumptions were later challenged by a critical review study which aimed to identify the primary research and the quality of the PFPS papers along with the number of patients included in each of them. One of the conclusions was that ACL reconstructions do not lead to PFPS (Selfe, 2004).

Today, there is still a controversy regarding this association. Recently, researchers (Culvenor, et al., 2014) reported that Patellofemoral OA is common following ACL reconstructions and is related to AKP. Patellofemoral Osteoarthritis (PFOA) is now considered as a subgroup of knee OA (Witvrouw et al., 2014). Several studies reported radiographic evidence in people with pain on the knee and regardless the methods they used, the prevalence was significant in the lateral patellofemoral compartment (Duncan et al., 2009).

Females are significantly more likely (2.21 times) to develop PFPS than males (Boling et al., 2010). Females are more vulnerable to suffer from PFPS because of anatomic factors such as the increased pelvic width, which results to an excessive lateral thrust on the patella (Boling et al., 2010). In addition, postural and psychosocial factors such as wearing high heels and...
sitting with the legs adducted when wearing a skirt, can produce the incidence and acuteness of this syndrome in females (Fulkerson and Arendt, 2000). Another population that is affected more is adolescents between 12 and 17 years of age (MacIntyre and Robertson, 1992). This is probably because adolescents are usually more active than adults whilst their biomechanical alignments are still dynamic (MacIntyre and Robertson, 1992). Other evidence regarding the prevalence or incidence to other populations shows that the incidence in military men is 3.8% and in women 6.5% annually, whilst the prevalence is 12% in men and 15% in women (Boling et al., 2010). The rate is around 9% in young active adults (Witvrouw et al., 2000). The frequency is 5.4% of the total injuries high as a quarter of the overall knee problems treated in sport rehabilitation clinics (Devereaux and Lachmann, 1984).

PFPS is very common in athletic communities, thus, PFPS is also known as the Runner’s Knee (Mensch and Ellis, 1986). In addition, 5 years after rehabilitation, 80% still reported pain and 74% had reduced their activity level (Noehren, Scholz, & Davis (2011)). However, the general and sporting populations’ true incidence is unknown, and the much-cited figure of 25%-40% (Witvrouw et al., 2014) is based on reports from sports clinics which have ascertainment bias because the general population they see is athletes. Thus, there is not enough evidence to confirm the incidence of PFPS in non-athletic clinics. (Mølgaard, Rathleff and Simonsen, 2011).

Risk factors

Only recently the aetiology of PFPS has been separated into different subgroups (local, proximal, distal) of risk factors. This first attempt was reported in the first PFPS consensus meeting in Baltimore, Australia (Davies and Powers, 2010). A later update (Witvrouw, et al., 2014) recommended for first time that interventions should be tailored to specific populations of patients (i.e. adolescents, athletes, military, older adults whilst the methods for participant recruitment should be well described to include the site (school, sport clinics). Latest update (Crossley et al., 2016) showed that abnormal joint alignment, lower limb muscle weakness, and abnormal biomechanics should be always considered, however; a recent review of reviews has shown that there are so may contradictions between studies that the only risk factor that all research studies agree on is the quadriceps weakness (Papadopoulos et al., 2015).

Contemporary management strategies

Since there are many factors that can lead to PFPS, before treatment planning, a detailed examination is needed (Collins et al., 2012). A detailed physical examination allows identification of the unique contribution for everyone (Harvie et al., 2011). This would include strength and flexibility of several muscles, lower limb alignment, patella position, muscle coordination and proprioception (Harvie et al., 2011). Collins et al. (2012) suggested that the rehabilitation programme should be separated in the same subcategories of risk factors, i.e. local, proximal and distal. This would provide clinicians with a simple guide to check all three joint components that might affect the knee. A recent update on rehabilitation of PFPS (Dutton, Khadavi and Fredericson, 2014) suggests the utility of quadriceps strengthening; especially of the VMO. In addition, soft tissue flexibility such as the hamstrings, calves, Iliotibial Band (ITB) /Tensor Fascia Latae (TFL), patellar taping, patellar bracing for patellar maltracking, hip strengthening (especially of the gluteus medius), foot orthotics to decrease foot eversion, gait re-education, and training modification may be required in the treatment of PFPS. However, there are many contradictions between studies with regards to the treatment components (Witvrouw et al., 2014). In addition, functional tasks such as squats, stationary cycling, static quadriceps, active straight leg raise, leg press, and step-up and down exercises are suitable for patients with patellofemoral pain syndrome (Harvie et al., 2011). Regardless the available treatment techniques that clinicians have in their hands, there is still no evidence regarding the effectiveness of those techniques in different patient populations (athletic/nonathletic patients/military) and in different clinical environments (sport clinics/hospitals). Therefore, there might be a lot of literature on assessing and treating patients with PFPS that clinicians cannot use because of the patient characteristics or because of barriers in their clinical environments. Future studies should address these concerns.

References


