THE EFFECT OF SEX ON PAIN AND HAMSTRING LENGTH IN PATIENT WITH PATELLOFEMORAL PAIN

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Abstract

Back ground: patellofemoral pain (PFP) is pain in the retro patellar or per patellar region of the knee.Objective: to evaluate effect of gender on pain severity and hamstring length in patient with PFP Methods: this was a cross sectional study on 46 athletes with PFP. Hamstring length and pain was measured. Mean differences (T-test) and Pearson correlation coefficient was calculated.Results: Mean (standard deviation) values for popliteal angle and VAS in two group were 153.52(10.46) and 5(2.1) respectively. Discussion& Conclusion: this study did not show any association between sex. No association between the hamstring length and self reported pain severity were found. Further research is needed.

Key words: *patellofemoral pain, popliteal angle, hamstrings length.*

INTRODUCTION

Patellofemoral pain (PFP) is pain in the retro patellar or peripatellar region of the knee. PFP accounts for 25% to 40% of all knee problems seen in sport medicine. PFP commonly occurs in high-impact sports such as running, basketball, and football causes of PFP include joint overuse or overload and biomechanical and muscular changes to the patellofemoral joint (Gregory et al. 2008). Short hamstring may produce greater patellofemoral joint reaction forces lead to subcondral bone stress and cartilaginous lesion (Besier el al. 2005).
There is anatomical and physiological differences between sex compared with men, women have wider pelvic, it can produce varus of the hip, increased femoral anteversion and geno valgum, which is known to be a predisposing factor for PFP (Tallay et al, 2004).

Studies also show that female athletes have increased hamstring flexibility and general joints laxity their male counter parts (Salli et al, 2001).Previous study on the hamstring length have shown conflicting results smith et al. reported that hamstring length was correlated with patellofemoral pain in a longitudinal study of figure skaters, but no actual raw data on hamstring length were presented. In a cross sectional observational study Piva et al. reported that hamstring length was significantly shorter in patients with PFP than controls. in contrast, Witvrouw et al carried out a 2-years prospective study of 282 students, 24 of whom developed PFP over the period, but found that hamstring length did not differ significantly between student who did and students who did not develop PFP (Witvrow et al, 2000). White et al reported that patients with PFP had shorter hamstring muscles than asymptomatic controls.

White (2008) has recommended hamstring length relationship with pain severity (White et al, 2008). Yet has not been determined association between pain intensity and hamstring length between sexes (Good et al, 2001; Thomee et al, 1993; Duffey et al, 2000; Caylor et al, 1993, Grelsamer et al, 2005). Therefore the main goal of present study is the effect of sex on pain and hamstring length in patient with patellofemoral pain syndrome.

METHODS

STUDY DESIGNE
This was a cross sectional and comparative study of 46atlethts (23 males, 23 females).
Ethical approval was granted by the research Ethics Committee. Prior to participating in this study all subjects read an information sheet about the study and gave informed consent.
Inclusion criteria: PFP patients aged between 17-27 years were recruited from orthopedic outpatient clinic. All patients who were referred to orthopedic surgeon, with a diagnosis of PFP were invited to participate in the study. To be included, PFP patients had to present with non-specific pain over the anterior aspect of the knee during or after activities such as ascending or descending stairs, running, squatting and sitting with their knees flexed.
Exclusion criteria: subjects were excluded if they had previous knee surgery, Osgood- schlatters or sinding-larsen and a history of fracture in lower limb.

Procedure: before study participation, all subjects received oral information about study. Also all patients warmed up by stretching exercise.
Pain assessment:
Pain was documented on a 10-cm visual analog scale (VAS), with 0 indicating no pain and 10 indicating extremity intense pain. Additional yes or no questions were administered for pain during squatting, stair climbing, and prolonged sitting [6].

Popliteal angle measurement
Hamstring length (popliteal angle) was evaluated by passive knee extension method. Several studies reported excellent reliability. Data were collected from the symptomatic leg of the PFP patients. Each patient was instructed to lie supine on the board. The asymptomatic leg was strapped on the board. The leg to be measured was positioned whit the Hip flexed to 90 degrees then examiner1 extended the knee passively to the point of firm resistance to movement. Patients described pain during the procedure. The measurement was repeated three further times. Examiner 2 placed the center of goniometer over the lateral femoral condyle, and aligned the two goniometer arms with lateral malleolus at the ankle and the greater trochanter at the hip. Examiner 2 read and recorded the politeal angle.

Statistical analysis
All data were analyzed using SPSS version 16 for windows. Appropriate descriptive statistics were used (mean and standard deviation [sd] for age, BMI, VAS scores and degrees of popliteal angle. K- S test was used for normal distribution of data. We used Pearson correlation analysis for examining the association between the pain severity and hamstring length. We compared hamstring length between sexes using an independent T test.

RESULTS

The demographics data of the group (Table1) show that the two groups were similar in age, body mass index (BMI).The Mean (SD) values for hamstring length were similar between groups. Analysis with a t-test revealed that this difference was not statistically significant ($p>0.05$).

Table1. Descriptive characteristics data of two groups mean (standard deviation) values

group	Age(year)	BMI(kg/m2)	VAS (cm)	Popliteal angle(degree)
Male(n=23)	21.17	21.13	4	153.52(10.4)
Female (n=23)	21.60	22.23	3	153.78(8.3)

Independent T test showed no significant differences in popliteal angle between groups. Pearson correlation was no significant between VAS and popliteal angle in two groups.

Table2.Mean differences between gender by an independent sample t test (p. value <0.05 is significant.)

Variables	T	df	Mean difference	P. value
Popliteal angle	0.08	43-44	0.26	0.93

Table3. Pearson correlation between pain and politeal angle.

Male	Popliteal angle	Pearson correlation & p. value
	VAS	R=0.51 P=0.35
Females		R=0.57 P=0.24

Correlation value >0.60 poor, 0.60- 0.70 fair, 0.70- 0.80 good, 0.80-1 excallent

DISCUSSION

The mean patient VAS score is similar to mean pain scores by Piva et al (Piva et al, 2009). our data suggest that no difference in hamstring length between sex. This study is agreement with finding of Witvrouw et al. The subjects were measured with warm up or ore stretching and this may have affected flexibility. This finding concurs with previous research in healthy adult supporting gender difference in flexibility. This is interesting because, notwithstanding the observation that males have tighter hamstring, the prevalence of PFPS is actually higher in females, and this therefore shows the multi-factorial nature of the condition (Aglight et al,

1983). Pervious study showed conflicting results. Differences between our results and pervious study may be explained by the difference in age. For hamstrings tightness in PFPS, 1 study reported a mean of 91°±20° while ours was 78°±12°. Because there is a negative correlation between age and muscle length, our lower values may be explained by the age differences (the mean age in our study was 29 years and in the other study was 19 years) (Messier et al, 1991).

PRACTICAL APPLICATION

As a consideration should be given by clinician to hamstring length on assessment of patient with PFP
Study limitation:

There are some limitations to this study. As in other research in this area, the examiners were not blinded to goniometer reading. This may have caused subconscious experimenter bias during the testing. Diagnosis and classification of PFPS is difficult, and as criteria can also differ between studies. This may affect the generalisability of these results.

Conclusion:
This study did not show any association between sexes. No association between the hamstring length and self reported pain severity were found. Further research is needed.

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REFERENCES

1. Gregory R, Waryasz and Ann y Mc Dermmote. Patellofemoral pain syndrome (PFPS): a systemic review of anatomy and potential risk factors. Dyn Med, 9(7), 2008.
2. Besier, TF gold, GE Delp SL. A modeling frame work to estimate patellofemoral joint cartilage stress in vivo.Med Sci sport Exercise; 37:1924-1930, 2005.
3. Tallay A, kynsburge A. balogh E. Prevalence of patellofemoral pain syndrome: Evaluation of the role of biomechanical mal alignments and the role of sport activity. Over Hetil, 145:2093-101, 2004.
4. Salli, RE, Jenes S. comparing sport injures in men and women. Int J sport Med; 22:420-423, 2001.
5. White LC, dolphinP, Dixon J. Hamstring length in patellofemoral pain syndrome. physiotherapy Res Int, 13(4):207-8, 2008.
6. Good M, Stiller C, Anderson GC. Sensation and distress of pain scales: reliability, validity and sensitivity. J Nurs Meas; 9:219-38, 2001.
7. Haim, A; yaniv, M; Dekel, S; Amir, H. Patellofemoral pain syndrome: validity of clinical and radiological features. Clinical orthopeadics& related Research: 223-8, 2006.
8. Aglight, P; Insall, JN; Crulli, G. patellar pain and incongruence I; Measurements of incongruence. Clinical orthopeadic & Related Research. 217-224, 1983.
9. Messier, SP; Davis, SE; curl, ww; lowery, RB. Peak RJ. Etiologic factors associated with patellofemoral pain in runner Medicine &science in sport &Exe; 23.1008-1015, 1991.
10. Witvrow, E; Lysens, R; Bellemans, J; cambier, D. Intrinsic risk factors for the development of anterior knee pain in an athletic population.A two-year prospective study. Am J sports Med; 28:480-489.56, 2000.
11. Thomee, R; Renstrom, P; Karlsson, J Grimby, G. Patellofemoral pain syndrome in young women: A clinical analysis of alignement pain parameters common symptoms and functional activity level.scand J Med Sci sports; 5:237-244, 1995.
12. Caylor, D; Fites, R; worrel, TW. The relationship between quadriceps angle and anterior knee pain syndrome.Journal of orthopeadics & sports physical therapy; 17:11-6, 1993.
13. Duffey, MJ; Martin, DF; Canon, DW; craven, I. Etiologic factors associated with anterior knee pain in distance rinners.Medicine &Science in sports &Exs; 32: 1825-32, 2000.
14. Grelsamer, RP; dubey, A; weinstien, CH. Men and women have similar Q angle: A clinical and trigonometric evaluation journal of bon &surgery British volume; 87:1498- 1501, 2005.
15. Piva S, Kelly f; Scot jons. Association of physical functional and pain in patient with patellofemoral pain syndrome.Arch phy Med Rehabilitation, 9: 285-295, 2009.
16. Rubin B, Collins R. Runner, s Knee. Phys sport med; 8:49-58, 1980.

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