Effect of Age on the Relation Between Knee Pain and Function in Egyptian Subjects with Knee Osteoarthritis

Ahmed M. Salama[1], Adel M E Zedan[2], Reham M. Abd Elrahim[3], Fathia M. Gelany[4], Ahmed M. Tawfick[5]

[1] Lecturer of Cardiovascular / respiratory disorders and geriatrics, department, faculty of physical therapy, Benha University, Qalyubia, Egypt.

[2] Musculoskeletal disorders department, faculty of physical therapy, Benha University, Qalyubia, Egypt. orcid=0000-0002-0639-9775.

[3] Lecturer of Basic sciences, department, faculty of physical therapy, Modern University for technology and information, Cairo, Egypt.

[4] Lecturer of Physical Therapy for women's and child health department, faculty of physical therapy, Merit University, Sohag, Egypt.

[5] Lecturer of Internal medicine and Elderly, department, faculty of physical therapy, Modern University for technology and information, Cairo, Egypt.

* Author for corresponding: Adel ME Zedan,
E-mail: adel.zidan@fpt.bu.edu.eg

Abstract

Purpose: Knee osteoarthritis is highly prevalent in general population and causes significant knee pain and malfunction. Effect of age on the relationship between knee pain also knee function had not been studied in Egypt and had not been found in the literature. This research aimed to explore the relation between knee pain also knee function in Egyptian population with knee osteoarthritis-related pain and to determine effect of age on this relation. Methods: This cross-sectional study involved seventy-eight patients having knee osteoarthritis-related pain aged from 40-80 years old. They were evaluated for their knee pain severity by visual analogue scale (VAS) also knee function by aggregate locomotor function scale (ALFS). Pearson correlation coefficient was calculated. Results: There was significant direct weak correlation between knee pain also knee malfunction (r=0.32, p=0.004) that was retained only in older Egyptian patients having knee osteoarthritis-related pain (r=0.38, p=0.015). Conclusion: In Egyptian patients having knee osteoarthritis-related pain who are younger than 60 years old, knee pain is not related to knee malfunction, i.e. they keep working in spite of pain. So, in this population, level of knee malfunction does not accurately reflect level of knee pain or disease severity. This to be considered during assessment of the impact of knee osteoarthritis and the outcome measures of the interventions.

Keywords: Knee pain, knee osteoarthritis, knee function, correlation, age.

1. Introduction

Knee pain is highly prevalent worldwide. In Egypt, approximately 9.3% of Egyptian population had knee pain, and 8.5 % had osteoarthritis [1]. Knee osteoarthritis (KOA) is the most prevalent cause of knee pain in the general population and can lead to substantial discomfort and dysfunction [2]. Degenerative joint condition of the knee, or osteoarthritis (OA) of the knee, is caused by the gradual breakdown and degeneration of articular cartilage over time [3].

Major OA symptoms include pain and diminished function. Knee pain and osteoarthritis (OA) cause slower and disordered gait and impaired sit to stand activity [4,5].

There are several measures to assess level of pain and function in these patients; some are self-reported and others are performance-based at baseline or to assess effects of various physical therapy or other interventions. Of these, aggregate locomotor function (ALF) score provides a more objective measure of the patient's overall functional ability (performance-based) [6]. Furthermore, visual analogue scale (VAS): Self-report measures of pain severity [7].

Knee OA is a widespread condition among the elderly and a major contributor to dysfunction. Among elderly subjects, Knee OA is highly prevalent as the incidence increases with increasing age [8]. Articular cartilage differs between OA and aging show that KOA is not a result of aging. As with aging there is reduced water and chondrocyte with no change in collagen organization in the cartilage. On the other hand, OA was associated with a rise in water content, a decrease in proteoglycan content, also with the disorganization of collagen [9].

As well, age is positively and significantly associated with radiographic severity of KOA [10] and functional impairment [11], but clinical evaluation of the

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patients having knee pain are important also more informative as severity of OA of the radiological examination may not correlate with of the patients ' functional activities. Magnusson et al. [12] have discovered that just 15% of patients having radiological evidence of knee OA actually experience symptoms.

Over the age of 60, symptomatic osteoarthritis affects 9.6% of men and 18.0% of women globally. The majority of people with osteoarthritis will experience mobility restrictions, and 25% will be unable to carry out even the most basic of everyday tasks [13].

According to World Health Organization (WHO) statistics, between 2002 and 2007, OA went from being the 12th main reason of years lost to disability / morbidity to being the 6th. As the world's population ages and the life expectancy of its population rises, OA is projected to become the fourth biggest cause of disability by 2020 [14].

However, the relation between pain and malfunction had not been studied in Egypt. In addition to that, effect of age on this relation had not been found in the literature. The set of this relation is an appropriate base for patient assessment and treatment So, the aim of this study is to explore the relation between pain also function in Egyptian patients having knee osteoarthritis-related pain and the effect of age on this relation.

2. 2. Patients and Methods

2.1. Study participants ad recruitment criteria

This study included seventy-eight patients with knee osteoarthritis-related pain of both sexes.

Inclusion Criteria

Patients were included if they had; 1) age from 40-80 years old, 1) Radiographic knee osteoarthritis, 2) Chronic knee pain over the past month, 3) BMI<35 kg/m^2.

Exclusion Criteria

Patients were not considered if they had trauma, surgery, significant injury to the knee during the previous 6 months, rheumatoid arthritis, dementia, severe hearing or visual impairment. All participants in this study gave their informed consent before getting involved.

2.2. Study Design

This cross-sectional study was carried out at the orthopedic physical therapy outpatient clinic in Kasr Al-Ainy hospital, affiliated with Cairo University.

2.3. Ethical approval for the study

The Physical Therapy Ethics Committee at Cairo University gave its approval to this investigation (No: P.T.REC/012/004038) and followed the principles outlined in the Declaration of Helsinki.

2.4. Sample size

The sample size was 78 patients based on power analysis taking the correlation (r=0.28). Power analysis was done using G*power software. Power was adjusted to (0.8) and significance to (0.05).

2.5. Outcome measures

Patients were assessed for knee pain severity, by VAS also knee function by Aggregate locomotor function (ALF) score.

1- Visual analogue scale (VAS): It's a self-administered pain scale and it's a line that's 10 centimeters long. Both "no pain" and "worst pain" serve as endpoints for the line. After being told to do so, patients were asked to place a mark on the line that most accurately reflected their level of discomfort [15].

2- Aggregate locomotor function scale (ALF) is valid, accurate, reliable, and objective measure of performance-based function. It sums the time of doing 3 activities: 8m walk, stair ascent and descent (7 steps), transferring from sitting to standing. Use of support (aid or rail) allowed only when needed [6].

2.6. Statistical analysis:

Data entry and analysis were done using Statistical Package for Social Sciences (SPSS) version 24 (IBM Inc.). Descriptive analysis was carried out in form of means and standard deviation (SD). Pearson correlation coefficients were calculated between VAS and ALFS. A level less than 0.05 was considered significant. Interpretation of correlation coefficient as follows; r≤0.1 negligible, 0.1-0.39 weak, 0.4-0.69 moderate, 0.7-0.89 strong, and ≥0.9 very strong correlation [16].

3. Results

3.1 Patient characteristics

Baseline characteristics of the participants were presented in table (1).

Table (1). General characteristics of patients.

Demographics	Mean ± Standard deviation
Age (years)	60.7±8
Body mass index (kg/m^2)	29.6±4.6
Gender (male %)	45%
Disease severity (KLG)	II & III
KLG Kellegren-Lawrence grading	

3.2. Relation between pain and function

The mean ± SD value of VAS scores was 5.8±2.1. The mean ± SD value of ALFS was 24.8±6.2 in all patients, as presented in table (2). Pearson correlation coefficient revealed significant weak direct positive correlation between pain also malfunction (r=0.32, p=0.004), as presented in table (3).

Table (2). Descriptive Statistics of VAS and ALF scores in all patients (n=78).		
	Mean	Standard Deviation
VAS	5.8	2.1
ALF	24.8	6.2
VAS: Visual analogue scale; ALF: Aggregate locomotor function		

Table (3). Pearson correlation coefficient between VAS and ALF scores in all patients (n=78).		
	r	Sig. (2-tailed)
Correlation between ALF and VAS	0.32*	0.004
r: Pearson correlation coefficient; (*): significant at p<0.05		

3.3. Effect of age on the relation between pain and function

Subgrouping the patients into two categories according to age (≤ 60 years and >60 years) and studying the relation between knee pain and function revealed that the relation retained only among the elderly group (r=0.38, p=0.015) but not in middle aged group (r=0.24, p=0.13), as presented in table (4).

Table (4). Pearson correlation coefficient between VAS and ALF scores in all patients (n=78) controlled for age.				
		r	Sig.	N
Correlation between ALF and VAS	≤60 yearsa	0.241	0.134	39
	>60 yearsb	0.381	0.015	39
(a): this group had 28.2% males; (b): this group had 61.5% males.				

4. Discussion

The incidence of knee OA is higher than that of other forms of OA, and it tends to affect younger and older people. Knee OA becomes more common with aging [17]. Li JS et al., reveals that age is not a determinant in the development of knee OA, as the annual incidence of symptomatic knee osteoarthritis is approximately 240 cases per 100,000 people [18]. KOA is primarily defined clinically by knee pain and dysfunction [19].

This cross-sectional study addressed relation between knee pain also function in Egyptian patients having knee OA -related pain and effect age on this relation. According to the findings of the current investigation the relation is weak positive direct relation and only retained in the older aged group. This demonstrates that middle aged people with knee osteoarthritis-related pain keep working and keep doing their activities and function in spite of their knee pain. This may be a particular feature of Egyptian population and a particular feature of middle-aged people who have KOA, so many life burdens that enforce them to do function in presence of pain.

There were several studies that assessed relation between pain also function in patients having knee osteoarthritis-related pain. The finding of the current study comes in agreement with those studies in the literature that found that knee pain is related (r=0.2-0.74) to knee function in older population (>45 years) with knee osteoarthritis-related pain [20-23].

The studies mentioned above addressed relation between pain and self-reported function except the latter [24], which also addressed relation between pain and performance-based function (as the case in the current study) and found lower correlation compared with self-reported one (average; 0.23 vs. 0.66). The current study found a higher correlation (average, 0.35).

Sadosky et al., mentioned that the severity of OA increases with an older population. Also, they observed increased pain VAS scores, poorer health outcomes, and a greater rate of overall work disability because of OA [25]. And similar findings were seen by J adhao AR et al., the age increases prevalence of knee OA (age 40-60 years- 26.3% and age >60 years43.2%) [26].

Sharma et al. also found a frequency of 56.6% in an older population (over 65 years old) in both urban and rural Chandigarh, Similar findings also observed by Bhaskar et al. [27].

Furthermore, almost all of these previous literatures studied the relation between knee pain also knee function in elderly patients having knee osteoarthritis and found significant relations. In the current study, authors confirmed that this relation present only in the older aged-group of the patients having knee osteoarthritis not in the middle age one.

With aging, knee pain and radiographic severity of OA is increasing, especially in women [28,29,30]. Women, especially those older than 55, were more likely to experience severe knee OA than OA in other parts of the body [31]. Occurrences of moderate-to-severe knee OA were common among middle-aged obese women [32].

From the previous studies concluded that, Age affects severity of KOA that may affects pain and function in the studied population. As age increases, KOA severity increases and hence pain may increase that increases malfunction. This is not the case in middle age patients who keep working in spite of pain. So, in this population, level of malfunction does not accurately reflect level of pain or disease severity. This also should be considered during assessing the baseline clinical characteristics to determine impact of knee osteoarthritis and during setting the outcome measures for these populations.

The current study has some strengths; specific

population, and studied relation between pain and performance-based function that is lacking in literature. However, it is limited by somewhat small range of age and disease severity.

5. Conclusion

This study concluded that knee pain related to knee function only in the elder Egyptian patients with knee osteoarthritis rather than the middle age group patient. Level of pain may be accurate outcome measure in middle aged patients and both pain and disability levels may be accurate outcome measure in elderly.

6. Limitations of the Study

1. Non-causal relation was studied
2. Le wide age rage.

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Conflict of interest

The authors report no conflict of interest

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