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Research Article

The Need for a Multidisciplinary Approach in Patients with Hip and Knee Osteoarthritis

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ABSTRACT

Introduction: Degenerative joint diseases (osteoarthritis) have considerable sociomedical importance due to their chronic nature, high frequency, demanding treatment and consequences they leave behind. The purpose of this study is to evaluate the relationship between knee/hip osteoarthritis and level of pain, depression and wellbeing.

Materials and methods: The cross-sectional study included patients with hip or knee osteoarthritis receiving treatment at the Clinic for Medical Rehabilitation, Clinical Centre of Vojvodina in Novi Sad, Serbia. Two sets of questionnaires were administered in the study: BPI (Brief Pain Inventory) and Beck Depression Inventory (BDI).

Results: A total of 60 subjects participated in this study (48 with knee OA and 12 with hip OA). Mild pain was detected in 12 patients (20%), moderate pain in 39 patients (65%), while 9 patients (15%) had severe pain. A strong pain effects were observed in 16 patients (27%). In the sample, 42 (70%) patients experienced low-level depression, and 18 (30%) patients had high-level depression.

Conclusion: A high level of depression was found in 30% of patients with hip and knee Osteoarthritis (OA). The pain effects on ADLs measured by BPI speak in favour of significant pain effects on ADLs in half of patients. Patients with a higher level of depression experience pain more intensely and encounter greater difficulties in performing activities of daily living. A multidisciplinary approach is needed when considering treatment for these types of patients.

Keywords: Knee osteoarthritis; Hip osteoarthritis; Pain; Depression; Multidisciplinary intervention

INTRODUCTION

Degenerative joint diseases (osteoarthritis) have considerable sociomedical importance primarily due to the chronic nature of the conditions, their high frequency, their demanding treatment and consequences they leave behind [1]. The Osteoarthritis Research Society International (OARSI) defined OA as a disease that manifests first as a molecular derangement (abnormal joint tissue metabolism) followed by anatomic, and/or physiologic derangements (characterized by cartilage degradation, bone remodelling, osteophyte formation, joint inflammation and loss of normal joint function) [2].

A higher risk of OA (10.9%) was observed in obese people [3]. Previous joint trauma, older age, physical inactivity, muscle weakness are also risk factors. Several studies provided evidence to support the claims that women appear to have higher OA prevalence, worse imaging findings and to develop more severe clinical picture [3] of the large joints, the hip and knee are most often affected [2,4].

Pain is the most common symptom in people with OA. Hawker et al. identified in their study that individuals with OA have two distinct types of pain: a persistent low-intensity background pain and severe intermittent pain [5]. Slow and insidious OA pain progression was also noted. In the early stages of the disease, pain episodes are predictable and often associated with certain activities. Over time, pain and other symptoms become less predictable and persistent, affecting activities of daily living. In addition to clinical examination, radiography can be helpful in confirming the diagnosis and excluding other joint anomalies. Almost 30% of people with OA have radiologically proven OA, and half of them have OA symptoms. There are clear X-ray signs that indicate OA: joint space narrowing, osteophyte formation, subchondral sclerosis and cysts [6].

As a result of the chronic nature of the disease, OA is associated with local inflammation and structural joint changes, that often lead to pain and loss of function, making it the leading cause of a significant impairment of the quality of life. Pain and inadequate pain control are often associated with signs of a depressive

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syndrome, which greatly impairs the quality of life of an individual [7]. Moreover, OA is associated with significant health and social costs, both directly and as a consequence of reduced work productivity and early retirement [2,8].

The treatment goal focuses on reducing pain and improving function, however, in order to improve the patients' health and general condition, health professionals are increasingly paying attention to psychosocial support [9].

With the aging population and increasing worldwide prevalence of obesity and inactivity (sedentary lifestyle), the number of OA patients will continue to raise, placing a significant burden on the health care system [10-12]. The purpose of this study is to evaluate the relationship between knee/hip osteoarthritis and level of pain, depression and wellbeing.

MATERIALS AND METHODS

The study included 60 patients presenting with hip and knee osteoarthritis (12 with hip osteoarthritis patients and 48 knee osteoarthritis patients), both male and female, of an average age of 66.27 ± 10.32 years, treated at the Medical Rehabilitation Clinic, Clinical Centre of Vojvodina in Novi Sad. The data were collected by a survey and all patients were interviewed by a personal contact method. Two sets of questionnaires were administered in the study: BPI (Brief Pain Inventory) and Beck Depression Inventory (BDI).

Brief Pain Inventory (BPI)

BPI is one of the most commonly used instruments for clinical pain assessment, which allows patients to assess the severity of their pain and to quantify the degree to which pain interferes with personal dimensions and functions. The first four questions in the questionnaire refer to the pain intensity in the last 24 hours, while other seven questions talk about its effects on activities of daily living. The patient fills out the questionnaire by choosing between 0-10 numerical response options, where in the first case, 0 means no pain, or, in the second case, no effects on activities of daily living, while 10 means severe pain, or a very significant effect on ADLs (Activities of Daily Living). The higher total score, the worse functional status of the examined patient [13].

Beck Depression Inventory (BDI)

BDI is a 21-item questionnaire, concerned with different aspects of depression, where items are answered with a series of four statements arranged according to the severity and scored from 0 to 3. The total score is obtained by adding up the scores for each item and ranges from 0-63, where scores 0-13 indicate minimal depression, 14-19 mild depression and 29-63 clinically relevant depression [14-16]. SPSS.20 statistical software suite was used for data processing.

RESULTS

Demographic of study participants

The study included 60 subjects (48 with knee OA and 12 with hip OA), both male and female (17 men, 43 women), of an average of 66.27 years (SD=10.32).

The average height of patients with hip and knee OA was 168.55 cm (SD=8.64), and the average weight was 83.31 kg (SD=18.33). It follows from this that the patients fall into the category of overweight according to the Body Mass Index, which is 29.54 (SD=5.32) (Table 1).

Table 1 shows the questionnaire results (BPI, BDI) for the total number of patients with hip and knee OA. The majority of our study sample consisted of patients with knee OA (N=48), while a smaller number of patients had hip OA (N=12). No significant differences in the anthropometric measures and the scores under the used questionnaires were recorded between these two groups ($p>0.05$) (Table 1).

In the sample, 12 (20%) patients reported mild pain, with their score on BPI scale ranging from 0 to 13. Moderate pain was present in 39 (65%) patients whose score ranged from 14 to 27. Severe pain was noted in 9 (15%) patients whose BPI score scale ranged from 28 to 40.

Table 1: Demographic characteristics of the osteoarthritis patients

Characteristics	Total (mean ± SD)	Knee	Hip	t	P
N	N=60	N=48	N=12		
Height (cm), X ± SD	168.55 ± 8.64	168.04 ± 8.58	168.04 ± 8.58	0.875	0.385
Weight (kg), X ± SD	83.31 ± 18.33	82.02 ± 16.39	88.25 ± 24.64	1.049	0.299
BMI* kg/m², X ± SD	29.54 ± 5.32	29.39 ± 5.39	30.13 ± 5.26	0.428	0.670
BDI**, X ± SD	12.77 ± 8.79	13.00 ± 9.04	11.83 ± 8.01	0.408	0.685
BPI*** pain intensity, X ± SD	5.075 ± 1.87	5.24 ± 1.84	4.40 ± 1.92	1.418	0.162
BPI_pain effects, X ± SD	5.71 ± 2.38	5.86 ± 2.38	5.11 ± 2.38	0.974	0.334

Note: *BMI-Body Mass Index, **BDI-Beck Depression Inventory, ***BPI-Brief Pain Inventory

The pain intensity evaluated subjectively by the BPI questionnaire shows that the intensity of pain is higher in patients with knee OA (M=20.98, SD=7.36) compared to patients with hip OA (M=17.58 SD=7.67) with the difference not reaching statistical significance, t=1.42, p=0.16 (Table 2).

Table 2: Average pain intensity values measured by BPI scale

BPI	Knee	Hip	t	P
	N=48	N=12		
BPI - Intensity of pain	20.98 ± 7.36	17.58 ± 7.67	1.42	0.16
BPI - The pain intensity effects on activities of daily living	41.05 ± 16.70	35.81 ± 16.63	0.97	0.33

A greater pain effect on activities of daily living was noted in patients with knee OA (M=41.05 SD=16.70) compared to hip OA (M=35.81, SD=16.63). The difference is statistically insignificant given that t=-0.97, p=0.33) (Table 2).

In the sample, the pain had no effects on activities of daily living in 4 patients (7%), and these were the patients with the BPI score from 0 to 13. Mild pain effects on ADLs were detected in 9 (15%) patients whose score ranged from 14 to 26. Moderate pain effects on ADLs were noted in 14 (23%) patients, whose score on BPI scale ranged from 27 to 39. Serious pain effects on ADLs were identified in 17 (28%) patients whose score on BPI scale ranged from 40 to 52. Severe pain effects were noted in 16 (27%) patients whose score on BPI scale ranged from 53 to 70 (Table 3).

Table 3: Pain intensity effects on activities of daily living measured by the BPI Scale

BPI score	Knee (N)	Hip (N)	Total (%)
BPI 0-13 Mild effects	7	2	15
BPI 14-26 Moderate effects	11	3	23
BPI 40-52 Serious effects	12	5	28
BPI 53-70 Severe effects	13	3	27

To determine the difference in depression in patients with hip and knee OA, the Mann-Whitney-U test was used, given that the depression variable was not normally distributed (Z=0.96, p=0.32). Patients with knee OA experienced a higher level of depression, compared to patients with hip OA. However, the observed difference is statistically insignificant, U=264.00, p=0.66 (Figure 1)

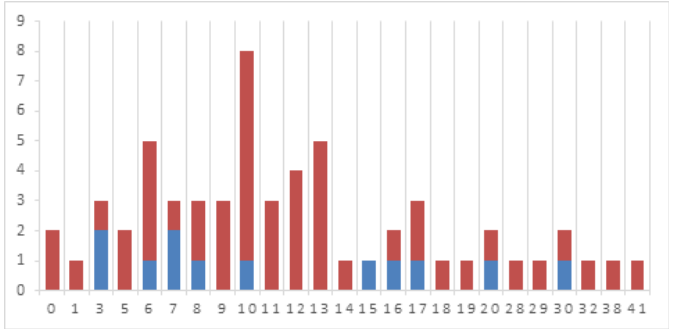

Figure 1: The difference in depression in patients with hip and knee OA
Note: Depression ( ) Knee, ( ) Hip

DISCUSSION

Degenerative joint diseases are progressive in nature and tend to gradually reduce mobility, and intensify pain over time, thereby further affecting the already impaired functionality. OA is not curable, however, there are ways to improve the quality of life. Therefore, there is a need for a multidisciplinary approach in managing the overall improvement in the best way, not only in the physical aspect, but also psychologically [9].

Recent randomized controlled studies show that psychosocial interventions can reduce osteoarthritis pain and thus disability [7,14-17]. Pain as a subjective sensation present in patients with OA is often detected in individuals suffering from depression. Pereira D. and Severo M [18] believe that depressed patients complain of pain more often.

The questionnaire used in this study - BPI is the most common questionnaire used to assess the functional status of patients with OA [19]. Furthermore, the Beck Depression Inventory is another most frequently used scale in detecting depression in different studies [20]. The Brief Pain Inventory scale showed the following results: the pain intensity score was 8 (M=8.72, SD=4.55), and the score of pain intensity effects on daily activities was 10 (M=95.47, SD=33.93), which are interpreted as high scores, i.e. indicating greater functional disability. Considering that the majority of patients have an advanced stage of osteoarthritis and are in their third age, the high BPI scale results are expected.

The BPI questionnaire results in this study are as follows: 12 (20%) patients experience mild pain, 39 (65%) patients have moderate pain and 9 (15%) patients have severe pain, indicating a higher pain intensity score in patients with hip and knee OA. The pain effects on activities of daily living were measured by the same questionnaire and the results indicate the following: 4 patients (7%) have no pain effects on activities of daily living, 9 patients (15%) experience mild effects on activities of daily living, 14 patients (23%) have moderate effects, serious effects are present with 17 (28%) patients, and 16 patients (27%) are found to have severe pain effects on activities of daily living.

Given that it is well known that depression symptoms are widely present in patients with osteoarthritis, more research is needed to answer the questions whether the effects of chronic pain in OA patients are more likely to worsen existing depressive symptoms or whether depressive symptoms can affect the subjective feeling of pain in an individual.

Some of the limitations of our study which may have contributed to some of the statistically insignificant findings include a small sample size, a cross-sectional design which affect causality and the unequal number of knee and hip OA patients. Also, most of our participants were elderly patients which may have impacted the depression scores.

CONCLUSION

The study found a high level of depression third of patients with hip and knee OA. Over half of the participants reported effects of pain on activities of daily living measured by. Moreover, patients with a higher level of depression experience pain more intensely and encounter greater difficulties in performing activities of daily living. While longitudinal studies are required to confirm the findings, our study suggests that multidisciplinary approach to treating OA patients is required, including psychological and well-

being assessment.

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COMPETING INTERESTS

The authors declare no completing interest

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AUTHORS' CONTRIBUTION

ST, DP ad FH contributed to the initial design and concept of the study. ST, DP and SC recruited and enrolled patients and managed data collection. ST, FH and SC performed the analysis. ST, FH and DP reviewed and interpreted the findings. All authors contributed to the revision of the manuscript and approved the final version.

DECLARATIONS

Ethics approval and consent to participate

Ethics approval from the Ethics Committee of the Clinical Centre of Vojvodina in Novi Sad, Serbia (No. 00-1141/8 od), was obtained, and all participants were enrolled in the study after signing the consent forms provided before entering the study. All methods were carried out in accordance with relevant guidelines and regulations in the Helsinki declaration.

Consent for publication

All authors consent to the publication of this study into BMC Rheumatology.

Availability of data and materials

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

REFERENCES

1. Abramoff B, Caldera FE. Osteoarthritis: pathology, diagnosis, and treatment options. Med Clin North Am. 2020;104(2):293-311.
2. Katz JN, Arant KR, Loeser RF. Diagnosis and treatment of hip and knee osteoarthritis: a review. Jama. 2021;325(6):568-578.
3. Bannuru RR, Osani MC, Vaysbrot EE, Arden NK, Bennell K, Bierma-Zeinstra SM, et al. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. Osteoarthritis Cartilage. 2019;27(11):1578-1589.
4. Aweid O, Haider Z, Saed A, Kalairajah Y. Treatment modalities for hip and knee osteoarthritis: A systematic review of safety. J Orthop Surg. 20 18;26(3):2309499018808669.
5. Hawker GA, Stewart L, French MR, Cibere J, Jordan JM, March L, et al. Understanding the pain experience in hip and knee osteoarthritis–an OARSI/OMERACT initiative. Osteoarthritis Cartilage. 2008;16(4):415-422.
6. Hawker GA. Osteoarthritis is a serious disease. Clin Exp Rheumatol. 2019;37 Suppl 120(5):3-6.
7. Törmälehto S, Aarnio E, Mononen ME, Arokoski JP, Korhonen RK, Martikainen JA. Eight-year trajectories of changes in health-related quality of life in knee osteoarthritis: Data from the Osteoarthritis Initiative (OAI). PLoS One. 2019;14(7):e0219902.
8. Grässel S, Muschter D. Recent advances in the treatment of osteoarthritis. F1000Res. 2020;9: F1000 Faculty Rev-325.
9. Vitaloni M, Botto-van Bemden A, Sciortino Contreras RM, Scotton D, Bibas M, Quintero M, et al. Global management of patients with knee osteoarthritis begins with quality of life assessment: a systematic review. BMC Musculoskelet Disord. 2019;20(1):493.
10. Arden NK, Perry TA, Bannuru RR, Bruyère O, Cooper C, Haugen IK, et al. Non-surgical management of knee osteoarthritis: comparison of ESCEO and OARSI 2019 guidelines. Nat Rev Rheumatol. 2021;17(1):59-66.
11. Fernández Cuadros ME, Moro OS, Florin MJ, Canelo JA. Ozone improves pain, function and quality of life in patients with knee osteoarthritis: A prospective quasi-experimental before-after study. Middle East J Rehabil Health Stud. 2017;4(1):e41821.
12. Filipović K. Glukozamin sulfat u lečenju osteoartroze kolena. Diss. University of Novi Sad (Serbia). 2014.
13. Charles S. The brief pain inventory user guide. Anderson Cancer Center. 2009.
14. Pantelinac S. Uticaj biopsihosocijalnih faktora na ishod rehabilitacije pacijenata nakon lumbalne mikrodiskektomije. Novi Sad. 2014.
15. Tomašević-Todorović S, Bošković K, Filipović D, Naumović N. Assessment of memory in patients with rheumatoid arthritis. Vojnosanit Pregl. 2011;68(6):481-488.
16. Novović Z, Mihić L, Tovilović S, Jovanović V, Biro M. Psychometric characteristics of the Beck depression inventory on a Serbian student sample. Psihologija. 2011;44(3):225-243.
17. Somers TJ, Keefe FJ, Godiwala N, Hoyler GH. Psychosocial factors and the pain experience of osteoarthritis patients: new findings and new directions. Curr Opin Rheumatol. 2009;21(5):501-506.
18. Pereira D, Severo M, Barros H, Branco J, Santos RA, Ramos E. The effect of depressive symptoms on the association between radiographic osteoarthritis and knee pain: a cross-sectional study. BMC Musculoskelet Disord. 2013;14(214).
19. Yilmaz T, Başpinar MM, Arslan NG, YAlçinkaya EY, Basat O. Is There an Effect of Pain and Radiological Stage on Quality of Life and Sleep in Patients with Osteoarthritis?. J PhysMed Rehab Sci. 2021;24(2).
20. Fonseca-Rodrigues D, Rodrigues A, Martins T, Pinto J, Amorim D, Almeida A, et al. Correlation between pain severity and levels of anxiety and depression in osteoarthritis patients: a systematic review and meta-analysis. Rheumatology. 2022;61(1):53-75.