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Brief communication

Analysis of the influence of pharmacotherapy on the quality of life of seniors with osteoarthritis

Katia F. Salvato[a], *João Paulo M. Santos*[a], *Deise A.A. Pires-Oliveira*[a], *Viviane S.P. Costa*[a], *Mario Molari*[a], *Marcos T.P. Fernandes*[a], *Regina C. Poli-Frederico*[a], *Karen B.P. Fernandes*[a,b,*]

[a] *Universidade Norte do Paraná, Londrina, PR, Brazil*
[b] *Pontifícia Universidade Católica do Paraná, Londrina, PR, Brazil*

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ABSTRACT

Aims: This study aimed to assess the influence of pharmacotherapy on health-related quality of life of elderly with ostheoarthritis.
Methods: Longitudinal study involving 91 older adults from both genders (Age: 70.36 ± 5.57 years) from EELO project with self-reported knee or hip ostheoartritis, confirmed by radiographic analysis. Data regarding pharmacotherapy was assessed by a structured questionnaire and the quality of life was analyzed by SF-36 questionnaire at the initial moment and two years thereafter. All domains from quality of life were grouped in physical and mental components for further data analysis.
Results: A statistically significant decline in both physical and mental components of quality of life was observed (Wilcoxon test, $p < 0.05$). However, it was observed a slighted decline in physical components in group treated with chondroitin/glucosamine when compared to other groups, according to Kruskal–Wallis test ($p = 0.007$). On the other hand, it was not observed any influence of pharmacological treatment on mental components of health-related quality of life ($p > 0.05$).
Conclusions: Treatment with condroitin/glucosamin contributes to a lower decline in physical component while it had no influence on mental component of health-related quality of life in older adults with ostheoartritis.

* *Corresponding author.*
E-mail: karenparron@gmail.com (K.B.P. Fernandes).
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Análise da influência da farmacoterapia sobre a qualidade de vida em idosos com osteoartrite

Palavras-chave:
Osteoartrite
Idoso
Funcionalidade
Incapacidade funcional
Qualidade de vida

RESUMO

Objetivos: Analisar a influência da farmacoterapia da osteoartrite na qualidade de vida de idosos.

Métodos: Estudo longitudinal, do qual participaram 91 idosos de ambos os gêneros (idade: 70,36 ± 5,57 anos), integrantes do projeto Estudo sobre Envelhecimento e Longevidade (EELO), portadores de osteoartrite de quadril e/ou joelho, confirmada por análise radiográfica. Foram levantados dados sobre a farmacoterapia da osteoartrite mediante o uso de questionários estruturados e a qualidade de vida foi analisada pelo questionário SF-36, no momento inicial e dois anos após a coleta de dados. Os diferentes domínios da qualidade de vida foram agrupados em domínios físicos e mentais para posterior análise dos dados.

Resultados: Foi observado um declínio estatisticamente significativo tanto nos componentes físicos quanto mentais da qualidade de vida dos indivíduos (teste de Wilcoxon, $p < 0,05$). Foi observado menor declínio no componente físico da qualidade de vida para os usuários de condroitina/glicosamina em comparação com o grupo tratado com anti-inflamatórios ou não tratado, segundo o teste de Kruskal–Wallis ($p = 0,007$). Por outro lado, não foi observada influência do tratamento farmacológico sobre o componente mental da qualidade de vida ($p > 0,05$).

Conclusão: O tratamento com condroitina/glicosamina contribuiu para menor declínio do componente físico e não influenciou os componentes mentais da qualidade de vida de idosos com osteoartrite.

Introduction

Osteoarthritis (OA), also known as arthrosis and osteoarthrosis, is a chronic degenerative disease caused by the deterioration of the cartilage and the formation of marginal osteophyte, with bone outgrowths on the surfaces and at the margins of the joints.[1] It is characterized by pain and functional limitations, it has slow evolution, as a result of the imbalance between the formation and elimination of the main elements of the cartilage.[2]

OA is age-related,[1] being the rheumatic disorder more prevalent among the elderly,[3] affecting approximately 10% of the world's elderly population.[4] Despite there is no accurate data in Brazil, Backer study[5] shows prevalence of 26.3%. In this context, it represents one of the most frequent causes of disability and pain in the musculoskeletal system.[3] Knee OA is the most common manifestation, affecting 23% of the elderly population, although these numbers are even higher among elderly women.[6] However, the prevalence of OA can reach 40% among individuals aged 74 or older.[6]

The cartilage lesion may be caused by a mechanical aggression or due to inflammatory joint disease, and it has strong genetic predisposition.[1,2]

Its pathophysiology is characterized by severe changes in the joint surface (loss of articular cartilage, ulceration, remodeling and sclerosis of the subchondral bone), with sudden biochemical changes in the proteoglycans, resulting in catabolic and anabolic processes in the cartilage metabolism, with reduced levels of chondroitin and glucosamine sulfates.[1]

Its symptoms are basically constant: localized articular pain, which accentuates with increasing load and movement (worse at the beginning of the movement and at rest), reduced range of motion, muscle weakness, joint stiffness after rest, crepitus and increased articular volume, with consequent progressive inability to perform usual activities, such as gait.[1]

OA is initially treated with physical measures, analgesics, steroidal and nonsteroidal anti-inflammatories (NSAIDs), and surgical treatment is indicated for the most severe cases only. However, based on the actual knowledge of the disease pathophysiology, disease modifying drugs, such as chondroitin and glucosamine seems to be able to abolish or reduce its symptoms, increasing functional status of the patients.[2,7]

Quality of life is an important item in the health of the individual that should be considered in the study of OA.[8] According to the World Health Organization (WHO), quality of life is the individual's perception of their position in life, in the context of culture and in the value systems in which they live and in relation to their goals, their expectations, their standards and concerns.[9] The instruments that assess quality of life may be influenced by the impact of the health condition in life, including the physical, emotional and social domains.[10]

Considering the concern over the use of medications in elderly patients with OA, the aim of this study was to analyze the effect of pharmacotherapy on the quality of life of these individuals.

Patients and methods

Ethical procedures

This study was approved by the Research Ethics Committee (protocol no. 0063/09). Before any procedure was undertaken, patients were briefed on the nature of the work and signed a free and informed consent form in which they agreed to participate in the study.

Outline and study population

Ninety-one elderly patients with OA from a subsample of EELO project were included in this longitudinal, observational study.

EELO was a thematic project developed in the city of Londrina, Paraná, which aimed to examine the social and demographic conditions and health indicators of elderly individuals of this city. The project had a total sample of 508 seniors, who were selected in a random and stratified manner from the records of Basic Health Units from this city.

The criteria for inclusion were patients of both genders, aged 60 years or older and diagnosis of hip and knee OA, either receiving clinically prescribed drug treatment or not and who had signed a free and informed consent.

The criteria for exclusion were individuals with full or partial prosthetics in any of the joints being evaluated, with concomitant diagnosis of other osteoarticular/muscle diseases, such as rheumatoid arthritis, fibromyalgia, systemic lupus erythematosus and other rheumatic diseases with severe cognitive impairment or those who have not agreed to sign the free and informed consent form.

Instrumentation

A structured interview guide with questions about gender, age, weight, height, race, previous occupation and occupational status was used to characterize the profile of senior patients with OA. The formula: weight (kg)/height^2 (m^2) was used to calculate the body mass index (BMI).

A structured questionnaire with information about drug type, dosage and duration of the treatment of patients with OA was used to evaluate the drug treatment adopted by the individuals. Then the patients were divided into three subgroups according to the treatment, for further statistical comparison: control group (individuals who are not making use of medication for OA), anti-inflammatory group (individuals being treated with steroidal anti-inflammatories and NSAIDs) or the chondroitin/glucosamine group (individuals being treated with the chondroitin + glucosamine association).

The Medical Outcomes Study 36 Short-Form Health Survey (SF-36) questionnaire, translated and validated into Portuguese and currently recommended by the American College of Rheumatology, was used to assess the quality of life. The SF-36 questionnaire is an instrument that covers the following domains: functional capacity, physical aspects, bodily pain, general health condition, vitality, social aspects, emotional aspects and mental health.

The first four domains (functional capacity, physical aspects, bodily pain, general health condition) assess the physical health or physical component, while the last four (vitality, social aspects, emotional aspects and mental health), the mental health or mental component. The score of each domain varies from zero to 100, in which zero corresponds to the worst health condition and 100, to the best. Each domain is analyzed separately, and there is no overall score.[11]

Procedures

Data collection procedures were carried out in two stages. With the objective of evaluating the variation in the quality of life of these elderly patients over time and with pharmacotherapy, these were reevaluated two years after the initial collection, i.e., the first evaluation was made in 2010 and the second in 2012.

Statistical analysis

A database was prepared in the Statistical Package for Social Sciences (SPSS) program, version 15.0, from the data collected. A confidence interval (CI) of 95% was established for all tests applied ($p < 0.05$).

Initially, the Shapiro–Wilk normality test was used and, as the data did not display a normal distribution, descriptive data, such as median and interquartile range (median; Q1–Q3) and nonparametric tests were applied to compare the groups.

The Wilcoxon test was used to compare the difference in the physical and mental components of the life quality of each group between evaluations (initial evaluation and final evaluation, carried out two years after the initial analysis).

In order to analyze if any pharmacological treatment would be related to a smaller decline of functional capacity, the variation of physical and mental components of the quality of life (Δ) was calculated, and the Kruskal–Wallis test was used to compare groups under drug treatment (control × anti-inflammatory × chondroitin/glucosamine).

Results

Ninety-one elderly patients with OA, predominantly female (71.4% of the sample), participated in the study. The age of the individuals was 70.4 ± 5.6 years, and it was observed that the study population presented high BMI (29 ± 5.2). The descriptive data of the study population are presented in Table 1. Table 2 lists the results of the groups in the first and second evaluations, with a statistically significant decline of the physical and mental components of quality of life ($p < 0.05$, Table 2) in all groups, according to the Wilcoxon test. It was observed that users of chondroitin/glucosamine had a smaller decline in the physical component of quality of life when compared to the group being treated with anti-inflammatories, or untreated, according to the Kruskal–Wallis test ($p = 0.007$, Table 2, Fig. 1A). On the other hand, the influence of the pharmacological treatment on the mental component of quality of life ($p > 0.05$, Table 2, Fig. 1B) was not observed.

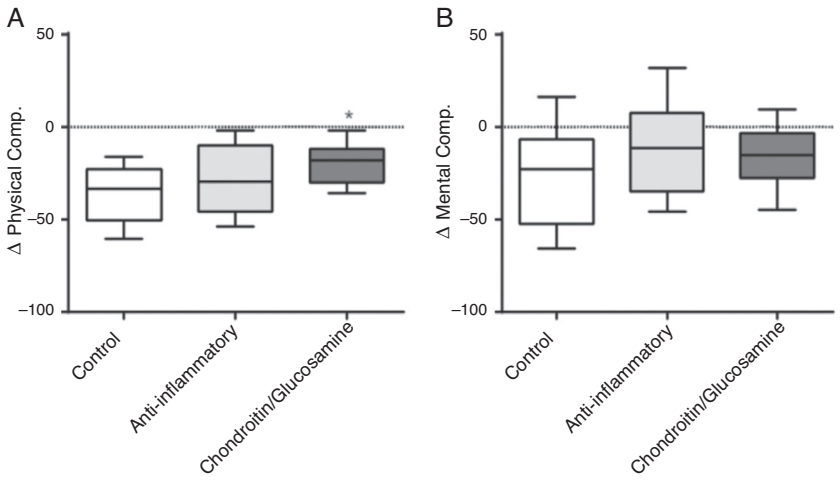

Fig. 1 – Variation of physical (Δ Physical Comp., A) and mental (Δ Mental Comp., B) components of quality of life in relation to pharmacological treatment.

Table 1 – Characterization of the variables of the study population.

Variables	Average	Standard Deviation
Age	70.36	5.57
BMI	28.99	5.25
Gender	Absolute frequency (*n*)	Relative frequency (%)
Male	26	28.6
Female	65	71.4
Total	91	100.0
Pharmacological treatment	Absolute frequency (n)	Relative frequency (%)
Control	50	54.9
Anti-inflammatory drugs	27	29.7
Chondroitin/Glucosamine	14	15.4

BMI, body mass index.

Discussion

OA is the most common joint disease in the world,[6] which justifies the importance of the study of this disorder on quality of life of senior patients. Moreover, OA is closely related to aging, causing pain and functional disability, with major social, psychological and economic losses, triggering the worsening of quality of life of these individuals.[5]

As the individual ages, the disease tends to progress as a result of the biomechanical aspects, causing deficit in functionality and quality of life,[10] since there is a process inversely proportional between disease progression and the quality of life of patients,[12] as demonstrated in the results of this study.

The BMI average was 28.99, corroborating other studies that show an association between OA and overweight, since obesity is the most significant factor for the onset of the disease.[13] In addition to that, obesity is associated with lower social classes.[14]

This sample was composed mostly by women and, according to evidence observed in other studies, women tend to have greater joint involvement as the quality of life declines,[10] facilitating the explanation of the negative variation perceived in all groups. This result could be explained by greater joint

Table 2 – Comparison of groups in of the 1st and 2nd evaluations and with regard to variation of physical and mental components of quality of life.

Groups	Life quality 1st evaluation	Life quality 2nd evaluation	*p*
Physical components			
Control	77.500	48.375	<0.001
Anti-inflammatory drugs	78.667	48.000	<0.001
Chondroitin/glucosamine	80.417	56.375	0.003
Mental components			
Control	87.625	65.437	<0.001
Anti-inflammatory drugs	82.275	55.662	0.037
Chondroitin/glucosamine	82.875	59.662	0.01

involvement, probably associated to clinical and functional changes.[15] OA is much more frequent among women above the age of 55,[16] especially among women from lower social classes.[14]

Thus, one can infer that poorer quality of life is associated with a worse functional capacity of patients with OA,[17] since the main problems of OA are pain and discomfort, which in turn cause functional limitations and changes in social behavior.[18]

While several advances have been made in trying to elucidate the pathogenesis of the OA, focusing on joint damage and changes in the joint's synovial fluid,[19] there is still no cure for this disease,[12] another factor that helps us understanding the worsening of the quality of life of the patients observed in this study.[12]

Although there is no cure, treatments can be divided into conventional (drug and physiotherapy) and surgical, and the choice of treatment will depend largely on the severity of the joint damage.[12]

The pharmacological treatment aims to relieve the signs and symptoms of the disease and whenever it is possible, reduce its progression. Thus, the goals of this treatment are pain relief, improving the quality of life, increasing mobility, increasing the ability to walk and reducing the progression of the disease.[12]

It was observed that the group treated with the chondroitin/glucosamine association showed a statistically less significant variation, leading to the assumption that this class would have better clinical efficacy. The glucosamine sulfate associated with chondroitin hydrochloride belongs to the group of OA-modifying drugs. It is known that the drug blocks a potential change of the viscoelastic properties of the cartilaginous tissue.[12]

The variation observed in the group treated with anti-inflammatory drugs did not show a statistically significant difference, probably due to mode of action of this drug type that act on the general treatment of symptoms (pain, fever and inflammation). However, there is still controversy over their effectiveness in pain from musculoskeletal conditions, with significant variation in the response of these drugs according to each individual.[20] According to several random clinical trials, NSAIDs produced better results with regard to pain when compared to placebo, but with worse results when compared to patients treated with painkillers.[21]

NSAIDs operate by inhibiting the synthesis of prostaglandins, which is known as a primary anti-inflammatory mechanism; prostaglandins are inflammatory mediators that contribute to pain and inflammation in a process mediated by cyclooxygenase enzymes (COX-1 and COX-2),[19] i.e., they inhibit COX-1 and COX-2. Despite the biomechanical characteristics of the disease, its pathophysiology is caused by an imbalance between the mechanisms of formation and degeneration of the cartilage matrix, being this process regulated by proinflammatory cytokines, such as the interleukin-1 (IL-1), the tumor necrosis factor alpha (TNF-alpha) and proteinases. Despite being widely used, the efficiency and safety of NSAIDs as a method of treatment of OA have not yet been elucidated.[12] The size of the sample and the lack of evaluation of drugs effects in the sense of being or not being dose-dependent were limiting factors for this study. Therefore, we suggest subsequent population-based studies to confirm these results.

Conflicts of interest

The authors declare no conflict of interest.

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