Brief communication

Use of the Lower Extremity Functional Scale (LEFS-Brazil) questionnaire compared to Lequesne Algofunctional Index for definition of knee and hip osteoarthritis severity

Uso do questionário *Lower Extremity Functional Scale* (LEFS-Brasil) em comparação com o Índice Algofuncional de Lequesne para definição de gravidade na osteoartrite de joelho e quadril

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A R T I C L E   I N F O

Introduction

Osteoarthritis (OA) is a chronic joint disease with a high prevalence in the elderly.[1] OA affects more often the hip and knee, compromising important aspects in activities of daily living such as walking, transposition of obstacles, home care and work activities.[2]

Several questionnaires have emerged to evaluate the functional capacity of patients with OA, which stand out by their simplicity and the ability to evaluate the perception of the individual about the disease and his/her limitations.[3] In this context, the Lequesne Algofunctional Index (translated and validated for the Portuguese) has a special emphasis, by being an instrument internationally recommended by the World Health Organization to assess pain and function of the hip and knee,[4,5] Lequesne's Index is widely used in Europe,[6] being often used as part of a clinical evaluation.[7]

Another questionnaire, the Lower Extremity Functional Scale (LEFS),[7] with a version translated and validated for the Portuguese (LEFS-Brazil),[8] has excellent reliability and high internal consistency and is considered a reliable and easy

instrument to be applied both for research and for the rehabilitation of patients with OA.[9]

Although there is evidence to demonstrate the applicability of the LEFS questionnaire in patients with OA of the knee and hip, there is a gap in the ability of the instrument to discriminate between different degrees of severity of osteoarthritis. Thus, this study aimed to establish a cutoff point for identifying severe functional impairment for the LEFS-Brazil in elderly patients with hip and/or knee OA, using as a basis the Lequesne Algofunctional Index.

Method

Ethical aspects

The project was approved by the Research Ethics Committee of the University of Northern Parana (Opinion No. 135 016). The selected subjects were informed about the objectives of the study and signed a Consent form, agreeing in participating in the study.

Study design and sample

This is a cross-sectional analytical study, based on criteria established by the STROBE list – Strengthening the Reporting of Observational Studies in Epidemiology,[10] with a convenience sample of secondary data from EELO (Study of Aging and Longevity) project. The EELO project was a thematic project developed by the Universidade do Norte do Paraná (UNOPAR) that aimed to evaluate the indicators of the health status of elderly subjects in Londrina, a northern city of Parana. More information can be found at http://www2.unopar.br/sites/eelo. This study was conducted in Londrina, since the elderly population of this city represents 12% of the total population, a number similar to that found in other developed countries.[11,12]

The total sample of EELO project consisted of 508 individuals, based on the Sample Calculation for Finite Populations formula, which is representative of the 43,610 elderly living in Londrina and registered in Basic Health Units (SUS). Of these seniors, 113 of both genders reported having hip and/or knee OA, and that were physically independent, according to Spirduso classification system for Functional Status (levels 3 and 4).[13]

Eligibility criteria of the study population

The inclusion criteria were: being elderly (age over 60 years), had participated in EELO project, having reported hip and/or knee OA in the EELO project, confirmed by clinical examination previously performed by an orthopedist following the criteria proposed by the American College of Rheumatology,[14,15] plus confirmation by radiographic examination performed by a specialist physician, according to the criteria described by Vasconcelos et al.[16]

The exclusion criteria were: having other rheumatic diseases affecting the lower limbs (such as rheumatoid arthritis, gout, and fibromyalgia, determined by self-report), osteoporosis in the lower limbs (verified by bone densitometry with a T score <-2,5[17] carried out subsequently to the EELO Project and

evaluated clinically by an orthopedist), hip or knee replacement (assessed by self-report), stroke sequelae, or Parkinson disease (checked by self-report), or having any other injury that would compromise the locomotor system (such as a tendinopathy, determined by self-report).

Clinical and radiographic evaluation

The diagnosis and classification of symptoms[15,16] of individuals who reported OA were determined by an orthopedist. Subsequently, only individuals diagnosed with OA underwent radiographic examinations of the hips and knees in the supine position, with frontal and side views, based on the criteria of Kellgren and Lawrence[18]; all individuals who were submitted to the study were with grade II (mild OA) to IV (advanced OA). A specialist was responsible for the classification of these subjects in categories relating to the radiographic findings; *this professional was blinded to the analyzed outcomes.*

Evaluation of functionality

Two instruments to evaluate the functional status of elderly patients with OA were employed: the Lequesne Algofunctional Index, translated and validated for the Portuguese, which contains 11 questions involving pain, discomfort and functional limitation,[6] with scores ranging from 0 to 24 (no involvement at all to an extremely severe impairment)[5]; the other instrument used was the LEFS-Brazil (Lower Extremity Functional Scale) questionnaire, which contains 20 specific questions related to musculoskeletal conditions of the lower limbs. In this latter instrument, the questions relate to activities of daily living and each question can be classified from 0 to 4 (from extremely difficult, to with no difficulty for carrying out activities) and its scores range from 0 to 80 points, with the value of 80 points representing maximum functional capacity.[9]

Statistical analysis

IBM SPSS (Statistical Package for Social Sciences, SPSS Inc., Chicago) version 20.0 was used for statistical analysis of the results, and a 95% confidence interval and a significance level of 5% ($p < 0.05$) were adopted for all tests.

Initially, descriptive statistics were carried out to characterize the sample. Then, the cutoff point for the definition of severe condition of osteoarthritis through LEFS-Brazil was determined using an ROC (Receiver Operating Characteristic) curve, and the categories of the Lequesne Algofunctional Index were used as a baseline tool.

In addition, the Spearman's correlation test was applied in order to verify the relationship between the Lequesne Algofunctional Index and LEFS-Brazil, considering that the data is not normally distributed once these data have arose from questionnaires.

Results

113 elderly subjects with knee and/hip OA with radiographic confirmation were initially enrolled at this study, but only 105
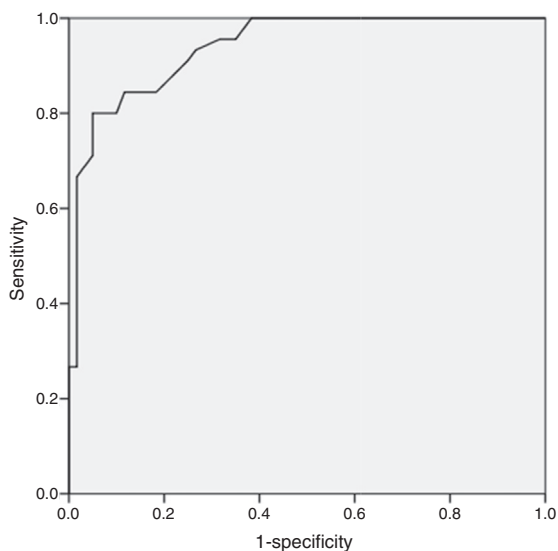
Fig. 1 – ROC curve for LEFS for severe functional impairment.

were included in final sample. Of these, 36 (34.3%) had hip OA, 42 (40.0%) had knee OA and 27 (25.7%) had hip and knee OA. The sample consisted of 32 men (30.5%) and 73 women (69.5%) with a mean age of 70.83 ± 6.06 years and a mean BMI of 28.71 ± 5.16. The elderly subjects had a median of 11.5 (1stQ: 6.25; 3rdQ: 17.50) for the Lequesne Algofunctional Index and a median of 48.00 (1stQ: 35.00; 3rdQ: 61.00) for the LEFS-Brazil.

The data from the ROC curve was used to identify the severe status of osteoarthritis from LEFS-Brazil, based on the Lequesne questionnaire and it is shown in Fig. 1. It was observed that, for a cutoff point of 48, the area under the curve was 0.94, with a good discriminatory power of this point to characterize more severe cases with good sensitivity (84.4%) and specificity (81.7%), and with positive and negative predictive values of 69.89 and 87.50, respectively. Moreover, a correlation between the Lequesne questionnaires and LEFS-Brazil ($rS = -0.86$, $p < 0.001$) was observed and is shown in Fig. 2.
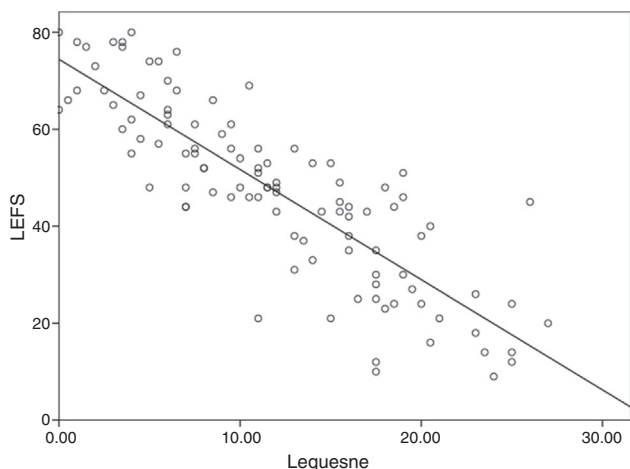

Fig. 2 – Correlation between LEFS e Lequesne Algofunctional Index.

Discussion

This study aimed to identify severe status of osteoarthritis using the LEFS-Brazil score, based on Lequesne Algofunctional Index. Our findings have demonstrated the existence of a strong correlation between the questionnaires used, allowing to identify the severe status of functional impairment for the LEFS-Brazil in elderly patients with OA. This categorization could facilitate the classification of functional impairment of these individuals, providing additional criteria to check the impact of the therapeutic approaches in activities of daily living of elderly patients with OA.

There are many questionnaires assessing individuals with knee and/or hip OA, with emphasis for the Lequesne Algofunctional Index that reflects the functional impairment and the painful picture of the individual in his/her daily life, being an instrument with excellent psychometric properties.[5,19]

Several studies have evaluated the responsiveness, reliability, construct validity and convergent validity of the Lequesne Index against another questionnaire (WOMAC).[20–23]

In a previous study,[24] we observed that the LEFS questionnaire shows a strong correlation with the Lequesne Index and also with WOMAC, confirming its validity as a clinical tool for the analysis of functional impairment in elderly patients with OA. However, the definition of cut-off points in its scale of severity of OA have not been previously published, and these findings could have a clinical relevance, both for evaluation and for analysis of the effectiveness of interventions in this patient group.

Despite the WOMAC questionnaire being widely used in OA and recommended by the American College of Rheumatology,[5] there is no description of cut-off points for the severity of the disease; thus, this instrument could not be used in obtaining the accuracy of analysis proposed in this study.

As limitations of our study, we can highlight the sample size and the cross-sectional design of the study as the follow-up of these subjects was not performed. Another important aspect is that the LEFS questionnaire is not an instrument recommended by the American College of Rheumatology or by the European League of Rheumatology. However, LEFS may represent a promising alternative compared to the WOMAC, because it has good internal consistency and is able to discriminate issues such as pain and function as supported by the findings by Pua et al.[25]

It may be noted that the LEFS questionnaire can be used as a method for assessing the progression and efficacy of treatment of OA, as it has two main properties of the instruments for functional status measurement[8]: (1) documentation of the outcome of therapeutic interventions, to ensure the quality and establish clinical standards; and (2) LEFS helps in setting objectives and targets for the treatment, in addition to measuring the individual's functional progress.

Conclusion

For older people with knee and/or hip OA, 48 points of the LEFS-Brazil questionnaire allows to identify severe functional impairment.

Conflicts of interest

The authors declare no conflicts of interest.

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