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Review Article

Role of physical activity in the management and assessment of rheumatoid arthritis patients

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ABSTRACT

Objectives: Rheumatoid arthritis (RA) is a chronic inflammatory disease affecting diarthrodial joints, in which patients tend to perform less physical activity (PA) than recommended. This review focuses on the existing evidence about the relationship of PA and RA, specifically how the former influences joint inflammation, disability, quality of life and pain in RA patients, and also how disease activity potentially impacts PA in these patients.
Methods: A literature search of EMBASE and MEDLINE databases from January 2000 to January 2015.
Results: The evidence indicating that PA in RA patients is safe and the benefits from regularly performing, both aerobic and resistance exercises, in these patients include improvement in: quality of life, functionality, pain and number of swollen joints. Interestingly, recent studies suggest that changes in disease activity in RA patients inversely correlate with variations in PA, as assessed by accelerometry.
Conclusions: The regular monitoring of PA in RA patients might facilitate a more objective evaluation of variations in disease activity, helping physicians to make general and therapeutic recommendations that will improve both the health status and the joint functionality of these patients.

Papel de la actividad física en el manejo y evaluación de la artritis reumatoide

Palabras clave:
Artritis reumatoide
Actividad física
Actividad clínica
Acelerometría

RESUMEN

Objetivos: La artritis reumatoide (AR) es una enfermedad inflamatoria crónica que afecta a las articulaciones diartrodiales, en la que los pacientes tienden a realizar menos actividad física (AF) de lo que se recomienda. Esta revisión se centra en la evidencia existente sobre la relación entre AF y AR, específicamente cómo la primera influye en la inflamación articular, la discapacidad, la calidad de vida y el dolor en los pacientes con AR, y también cómo la actividad clínica de la AR puede afectar a la AF de estos pacientes.
Métodos: Se realizó una búsqueda bibliográfica desde enero del 2000 hasta enero del 2015 en las bases EMBASE y MEDLINE.
Resultados: La evidencia indica que la AF en pacientes con AR es segura y que los beneficios de la realización periódica de ejercicios, tanto aeróbicos como de resistencia, en estos pacientes incluyen mejoras en: calidad de vida, funcionalidad, dolor y número de articulaciones inflamadas. Curiosamente, estudios muy recientes muestran que los cambios en la actividad de la enfermedad en pacientes con AR se correlacionan inversamente con variaciones en su AF, medida por acelerometría.
Conclusiones: El control sistemático de la AF en pacientes con AR podría facilitar una evaluación más objetiva de las variaciones en la actividad de la enfermedad, lo que ayudaría a los médicos a hacer recomendaciones generales y terapéuticas para mejorar tanto el estado de salud como la funcionalidad articular de estos pacientes.

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Introduction

Although there are extensive data showing the beneficial effects of physical activity (PA) on cardiovascular disease and all-cause mortality, physical inactivity is a major health problem worldwide.[1] The precise measurement of PA is key to study its association with diseases, but the assessment of PA is complex and it is conditioned by a balance between accuracy and ease of use.[2]

Rheumatoid arthritis (RA) is a chronic, systemic, inflammatory disorder of unknown etiology. Because the central pathology of RA occurs in the synovial membrane, joint limitation is a typical manifestation of the disease. This, in addition to the fact that most RA patients also suffer from muscle loss, contributes to decreased physical function and quality of life in these patients. In this regard, it has been shown that RA patients tend to exercise less than healthy controls when PA is measured by both subjective[3–5] and objective methods.[5–8] Moreover, there remain two important unanswered questions concerning PA vis-à-vis RA: (1) Do patients who are sufficiently physically active suffer less aggressive disease? and (2) Does disease activity influence PA in RA patients? With regard to the former, there is considerably more evidence favoring the prescribing PA for RA patients than there is against.[9–11] With regard to the latter, although there is less evidence, recent data suggest that disease activity influences negatively the PA in RA patients.[5,7]

This work reviews the current evidence about the relationship between PA and RA, specifically how the former influences joint inflammation, disability, pain and quality of life in these individuals, and also how RA disease activity potentially impacts on PA in these patients. We purpose that periodic monitoring of PA using objective methods, as the accelerometry would help to better handling of RA patients.

Strategy and results of literature searching

A review was conducted by the documentation department of the Spanish Rheumatology Society (SER) to identify all published literature relating to PA and/or energy expenditure in people with RA. The search strategy combined 2 sets of keywords. For Embase, EMTREE terms were used. In this case the search consisted of rheumatoid arthritis AND physical activity OR motor activity OR energy expenditure OR leisure activity AND accelerometry OR questionnaire OR calorimetry. For MEDLINE, the MeSH terms were: arthritis, rheumatoid AND leisure activities OR motor activity OR energy metabolism AND accelerometry OR questionnaires. The results included all publications published from 1 January 2000 to January 2015, that included at least 1 search term from each of the 2 categories. Only English language publications were included.

To be included in the review, studies had to be: (1) either observational studies or interventional studies with programs of exercises measuring free living PA or total/activity related energy expenditure levels, using either subjective or objective methods and (2) related to adult RA population with all subjects included in studies fulfilling the criteria set down by the American College of Rheumatology, 1987. Studies which were: (1) interventional in nature with new pharmacological treatments; (2) not in English; or (3) published only in abstract format were excluded. The article selection flowchart is described in Fig. 1.

Assessment of PA

PA is defined as any bodily movement produced by skeletal muscles that result in energy expenditure.[12] Under this broad concept, activities relating to leisure-time, exercise, sports, locomotion (e.g., walking, biking), and work must be considered parts of PA. Sedentarism has been defined as expenditure below 10% of total daily energy expenditure performing moderate- and high-intensity activities.[13] Since, sedentarism has been associated with high incidences of obesity, type-2 diabetes mellitus, cardiovascular disease and other chronic illnesses,[14] its prevention has become a priority of the public healthcare systems. To avoid the consequences of sedentarism, U.S. Department of Health and Human Services recommends that adults should do at least 150 min a week of moderate-intensity exercise (e.g., brisk walking).[15]

A very accurate measurement of PA can be obtained by the assessing the total daily energy expenditure, albeit using expensive and cumbersome procedures such as the doubly-labeled water technique[16] or calorimetry.[2] Viable alternatives, involving less precise but more accessible methods, are available, however. These include questionnaires and triaxial accelerometers, approaches that are gaining acceptance for assessing PA both in healthy individuals and in patients suffering chronic diseases.[17–19] Although questionnaires provide a evaluation limited by subjectivity, in the last 10 years a significant number of them have been developed to assess PA in different diseases; one of them, the International Physical Activity Questionnaire (IPAQ), has been used mainly for research purpose in rheumatic diseases.[4,5,20] This self-report method is the cheapest and easiest way to quickly compile PA data from a large number of people providing an assessment of PA by domains. Alternatively, accelerometers are easily portable devices that offer one important advantage in objectively measuring PA based on the fact that it can capture continuously, for days and weeks distinctive characteristics of movement including the direction, frequency, intensity and duration of PA, as well as resting periods.[21] Although accelerometry has already been employed in clinical osteoarthritis trials,[22–24] it was not until recently that this technique was used to evaluate PA patterns in inflammatory joint disorders such as RA.[5,7,8,25]

PA in RA patients

Regular exercise with a moderate to high level of intensity has proven to be effective in improving muscle strength and cardiovascular fitness in healthy populations and in patients with chronic illnesses, including RA.[11,26–28] RA, if left uncontrolled, leads to joint deformity and destruction due to the erosion of cartilage and bone. Consequently, it has been assumed than RA patients are less active than the general population because of such joint manifestations. An additional factor that may have contributed to this inactivity tendency stems from recommendations, classically given by physicians, which restrict exercise due to concerns that excessive PA might aggravate both joint inflammation[29] and pain,[30] and accelerate joint damage in RA patients. However, currently, evidence suggests that exercise has no deleterious effects either on disease activity or on joint damage[27,31] and improves muscle strength[32] in RA. In this regard, recently it has been suggested that RA patients who are physically active before clinical disease onset present with a milder disease, both in terms of inflammation, pain and function.[33]

Patients with RA have an increased risk of developing cardiovascular diseases, resulting from a proatherogenic profile driven by systemic inflammation.[34] In healthy populations there is an inverse relationship between PA and cardiovascular risk (CVR) factors such as BMI, body composition (increased whole body fat and visceral fat)[35] and blood lipid levels.[36] Although different studies on the relationships between PA, BMI, fat mass and lipid levels in RA populations have yielded controversial data,[5,37,38] the evidence clearly suggests that PA improves the CVR profile in RA patients.[5,11,39]

Different questionnaire-based surveys have indicated that RA patients tend to exercise less than what is currently recommended.[3,40,41] When PA is objectively assessed by

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