REVIEW ARTICLE (META-ANALYSIS)

Ottawa Panel Evidence-Based Clinical Practice Guidelines for Aerobic Walking Programs in the Management of Osteoarthritis

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ABSTRACT. Loew L, Brosseau L, Wells GA, Tugwell P, Kenny GP, Reid R, Maetzel A, Huijbregts M, McCullough C, De Angelis G, Coyle D, and the Ottawa Panel. Ottawa Panel evidence-based clinical practice guidelines for aerobic walking programs in the management of osteoarthritis. Arch Phys Med Rehabil 2012;93:1269-85.

Objective: To update the Evidence-Based Clinical Practice Guidelines (EBCPGs) on aerobic walking programs for the management of osteoarthritis (OA) of the knee.

Data Sources: A literature search was conducted using the electronic databases MEDLINE, PubMed, and the Cochrane Library for all studies related to aerobic walking programs for OA from 1966 until February 2011.

Study Selection: The literature search found 719 potential records, and 10 full-text articles were included according to the selection criteria. The Ottawa Methods Group established the inclusion and exclusion criteria regarding the characteristics of the population, by selecting adults of 40 years old and older who were diagnosed with OA of the knee.

Data Extraction: Two reviewers independently extracted important information from each selected study using standardized data extraction forms, such as the interventions, comparisons, outcomes, time period of the effect measured, and study design. The statistical analysis was reported using the Cochrane collaboration methods. An improvement of 15% or more relative to a control group contributes to the achievement of a statistically significant and clinically relevant progress. A specific grading system for recommendations, created by the Ottawa Panel, used a level system (level I for randomized controlled studies and level II for nonrandomized articles). The strength of the evidence of the recommendations was graded using a system with letters: A, B, C+, C, D, D+, or D–.

Data Synthesis: Evidence from 7 high-quality studies demonstrated that facility, hospital, and home-based aerobic walking programs with other therapies are effective interventions in the shorter term for the management of patients with OA to improve stiffness, strength, mobility, and endurance.

Conclusions: The greatest improvements were found in pain, quality of life, and functional status (grades A, B, or C+). A common limitation inherent to the EBCPGs is the heterogeneity of studies included with regards to the characteristics of the population, the interventions, the comparators, the outcomes, the period of time, and the study design. It is strongly recommended to use the Cochrane Risk of Bias Summary assessment to evaluate the methodologic quality of the studies and to consider avenues for future research on how aerobic walking programs would be beneficial in the management of OA of the hip.

Key Words: Exercise; Knee; Osteoarthritis; Practice guidelines as topic; Rehabilitation; Review [publication type]; Rheumatology; Walking.

OSTEOARTHRITIS (OA) is the most common joint disorder, often affecting the knees and hips.[1] Symptoms include pain, temporary stiffness, crepitus, swelling, fatigue, and movement limitation. OA is rarely present before the age of 40.[1] Incidence is greater among men before the age of 45 but

List of Abbreviations

AIMS	Arthritis Impact Measurement Scales
BI	behavioral intervention
BMI	body mass index
CCT	controlled clinical trial
EBCPG	Evidence-Based Clinical Practice Guideline
FU	follow-up
OA	osteoarthritis
PICOPS	population, intervention, comparator, outcomes, period of time, and study design
QOL	quality of life
RCT	randomized controlled trial
SMD	standardized mean difference

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higher among women after the age of 55. After the age of 70, there is a dramatic increase in prevalence of OA among both sexes, and the majority of older adults will develop OA in 1 or several joints.[2] Currently, more than 50% of Americans aged over 65 (over 24 million individuals) are affected by OA.[3] With the aging population, some researchers predict that by 2030, approximately 72 million Americans will have developed the disorder.[4,5]

In general, people diagnosed with OA will gradually become sedentary,[6] because most of them are approximately 3 times more likely to have difficulty walking, and to have 5 or more functional limitations.[2] The belief that physical activity causes an increase in pain to the affected joint has resulted in a negative chain reaction. Inactivity leads to decreased endurance and mobility, loss of independence, and thus it can reduce quality of life (QOL).[7] In addition, OA is responsible for a reduction in productivity, and an increase in disability compensation and work absenteeism. These indirect costs represent one third of the overall costs attributed to OA, where the total cost is estimated at $16,146. Direct costs are disbursed for pain medication and general medical treatments. Together, individuals affected by OA present an annual average cost of $11,542.[8]

The Ottawa Panel is a group of researchers producing Evidence-Based Clinical Practice Guidelines (EBCPGs) with the objective of reporting recommendations regarding specific interventions. General aerobic exercise is recommended as a core treatment for subjects with OA. An aerobic walking program is defined as "a dynamic physical activity with an intensity sufficient to improve aerobic capacity, and muscle strength, which establishes to improve functional status among older individuals with OA."[9(p677)] Many previous systematic reviews have already determined that walking is an effective and safe way to treat OA, but these reviews are now dated.[10,11] The scientific evidence recommends that aerobic physical activities, such as walking programs, have a therapeutic effect in the short-term (2–6mo) for pain relief, improved strength, and functional status in subjects diagnosed with OA.[12-14] However, these existing guidelines do not provide detailed recommendations regarding effective walking programs for OA. Therefore, an update of clinical practice guidelines for aerobic walking programs for OA would be a valuable resource for clinicians and researchers.[8,10,11]

The objective of this project was to create an EBCPG for an aerobic walking program in the management of OA of the knee, in order to support health professionals and their patients diagnosed with OA in choosing the most effective aerobic walking programs for this population. Evidence shows that an inactive patient with OA will present a gradual deterioration of the affected joint, an increase of functional dependency, and a poorer QOL.[7] It is, therefore, important to persuade inactive individuals to follow an aerobic walking program, which helps relieve pain and promote remodeling without increasing stress in the affected joint.[15] Even though aerobic walking promotes low impact on the weight-bearing articulations, positive changes are still attributed to improving joint loads and biomechanics, stability, and neuromuscular function.[15] Therefore, the stability of the affected joint assists persons with OA to be more functional in everyday living, which will progressively improve their QOL.[16] Promotion of aerobic walking, especially in a community-based context, is a priority for health organizations serving the general population and is highly recommended for subjects affected by OA, because it is easily accessible to walk in a shopping center or a community place, without having to spend too much money. In other words, walking is one of the safest no-cost ways of doing physical activity, because no special equipment is needed other than good walking shoes.[6]

METHODS

Protocols and Registration

The development process of the EBCPGs was similar to that of the Philadelphia Panel and other EBCPGs created by the Ottawa Panel.[12] The methodology of this project followed the Preferred Reporting Items for Systematic and Meta-Analyses[17] checklist from the *Journal of the American Physical Therapy Association*, the Ottawa Expert Panel methods, and used a quantitative grading system.

In conjunction with the methodology of previous Ottawa Panel publications,[18] the construction of the EBCPGs was developed using the Appraisal of Guidelines Research and Evaluation criteria (www.agreetrust.org). The Ottawa Panel individual recommendations were graded as A, B, C, C+, D, D+, or D– based on the strength of evidence (table 1). An alphabetical grading system was presented according to the Ottawa Panel methodology[18] in table 2. Appendix 1 and an additional alphabetical system recently adopted by the Cochrane Collaboration (www.cochrane.org) have the corresponding levels in parenthesis.

Eligibility Criteria

To accomplish systematic literature reviews, a list of eligibility criteria was developed by the Ottawa Methods Group, who decided to follow the population, intervention, comparator, outcomes, period of time, and study design (PICOPS) strategy, in order to ensure inclusion of relevant studies. Therefore, the inclusion and exclusion criteria include the characteristics of the population, intervention, comparator, outcomes, the period of time an intervention becomes effective, and the study design (see table 2). Only articles written in English or

Table 1: Grading for Recommendations

Grade	Clinical Importance (%)	Statistical Significance (*P*)	Study Design
A (strongly recommended)	≥15	<.05	RCT (single or meta-analysis)
B (recommended)	≥15	<.05	CCT or observational (single or meta-analysis)
C+ (suggested used)	≥15	Not significant	RCT/CCT or observational (single or meta-analysis)
C (neutral)	<15	Not significant	Any study design
D (neutral)	<15 (favors control)	Not significant	Any study design
D+ (suggested no use)	<15 (favors control)	Not significant	RCT/CCT or observational (single or meta-analysis)
D− (strongly not recommended)	≥15 (favors control)	<.05 (favors control)	Well-designed RCT with >100 patients (if <100 patients, becomes grade D)

NOTE. Combined Grading Recommendations according to the Ottawa Panel[18] for alphabetical grading system and the Cochrane collaboration (www.cochrane.org) for international nominal grading system.