Contralateral canes for knee osteoarthritis

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Abstract

Introduction

Knee osteoarthritis is a relevant health problem given its high prevalence and associated disability. Within the non-pharmacological management alternatives, the use of canes has been proposed, however, there is no consensus in the literature regarding its indication.

Methods

We searched in Epistemonikos, the largest database of systematic reviews in health, which is maintained by screening multiple information sources, including MEDLINE, EMBASE, Cochrane, among others. We extracted data from the systematic reviews, reanalyzed data of primary studies, conducted a meta-analysis and generated a summary of findings table using the GRADE approach.

Results and conclusions

We identified three systematic reviews including four studies overall, of which one was randomized trials. We conclude that the use of a contralateral cane in patients with knee osteoarthritis probably reduces pain. In addition, it could slightly increase function, but the certainty of the evidence is low.

Problem

Osteoarthritis is a relevant health problem, with hip and knee osteoarthritis the eleventh leading cause of global disability, the thirty-eighth in years of life adjusted for disability[1] and an important reason for consultation in both primary and specialist care. Conservative management is the first line of treatment and its main objective is pain control. This includes the use of drugs, patient education, weight loss in patients with obesity, kinesiotherapy and the use of technical aids such as the cane, among others. The cane is used with the aim of reducing the biomechanical load that is exerted on the hip and knee. However, there is no consensus in the literature about its effect or its indication.

Key messages

- The use of a contralateral cane in patients with knee osteoarthritis probably reduces pain (certainty of moderate evidence).
- It is not possible to establish clearly if the use of contralateral cane increases walking speed, because the certainty of the existing evidence has been evaluated as very low.
- The use of a contralateral cane could slightly increase the function (certainty of the low evidence).

About the body of evidence for this question

What is the evidence. See evidence matrix in Epistemonikos later	We found three systematic reviews[2-4], which included four primary studies[5-8] of which one corresponds to a randomized trial[7]. All the studies reported interesting outcomes, for which reason this table and the summary, in general, are based on these.
What types of patients were included*	All the studies[5-8] included adult patients with a diagnosis of knee osteoarthritis, based on the American College of Rheumatology criteria, all of which presented symptoms (pain). The average age ranged from 53.6 to 65 years. 76.5% of the patients were women.
What types of interventions were included*	One study[5] evaluated the use of a contralateral walking pole, one trial[7] analyzed the use of a wooden cane with a contralateral T-shaped handle, the other two studies[6, 8] used contralateral cane not specifying the type. Three studies[5, 6, 8] compared the same patients without the use of canes, while one trial[7] compared a control group with knee osteoarthritis.
What types of outcomes were measured	Of the multiple outcomes measured by the trials, the systematic reviews presented in a grouped manner the following: pain, function, quality of life, walking speed, moment of adduction of the knee and vertical reaction force to the ground. The average follow-up of the trials was one month (range between 0 and 2 months).

* The information about primary studies is extracted from the systematic reviews identified, unless otherwise specified.

Methods

We searched in Epistemonikos, the largest database of systematic reviews in health, which is maintained by screening multiple information sources, including MEDLINE, EMBASE, Cochrane, among others, to identify systematic reviews and their included primary studies. We extracted data from the identified reviews and reanalyzed data from primary studies included in those reviews. With this information, we generated a structured summary denominated FRISBEE (Friendly Summary of Body of Evidence using Epistemonikos) using a pre-established format, which includes key messages, a summary of the body of evidence (presented as an evidence matrix in Epistemonikos), meta-analysis of the total of studies when it is possible, a summary of findings table following the GRADE approach and a table of other considerations for decision-making.

Summary of findings

The information on the effects of the use of canes in knee osteoarthritis is based on two studies, one observational[5] and one randomized[7], which included 98 patients.

The randomized trial[7] measured pain and function outcomes (64 patients), while the observational study[5] measured the walking speed outcome (34 patients).

The summary of the results is as follows:

- The use of contralateral cane in patients with knee osteoarthritis probably decreases the pain (certainty of the evidence is moderate).
- It is not possible to establish clearly if contralateral cane use increases walking speed, because the certainty of the existing evidence has been evaluated as very low.
- The use of a contralateral cane could slightly increase function (certainty of the evidence is low).

Contralateral canes for knee osteoarthritis

Patients Knee osteoarthritis
Intervention Contralateral cane
Comparison Without cane

Outcome	Absolute effect**		Relative effect (95% CI)	Certainty of evidence (GRADE)
	WITHOUT CANE	WITH Contralateral cane		
	Difference: patients per 1000			
Pain Visual analog scale 10 cm (VAS)	5,95 cm	3,84 cm	--	⨁⨁⨁◯[1] Moderate
	DM: 2,11 cm less (Margin of error: 1,41 a 2,81 cm less)			
Walking speed (m/s)	1,16 m/s	1,17 m/s	--	⨁◯◯◯[1,2,3] Very low
	DM: 0,01 m/s more. (Margin of error: 0,08 less a 0,1 more)			
Function*	One essay [7] measures function in three scales: Lequesne: DM: -2,34 (IC 95%: -4,34 a -0,72) SF-36- Physical domain: DM: -9,06 (IC 95% -17,81 a -0,31) WOMAC: DM: -1,06 (IC 95% -8,87 a 6,75).		--	⨁⨁◯◯[1] Low
Adverse events	The outcome adverse events did not measure or report by a systematic review		--	--

Margin of error: 95% confidence interval (CI).
MD: Mean difference.
GRADE: Evidence grades of the GRADE Working Group (see later).
* Lequesne scale: Scale that measures function from 0 to 24 points, less score better function.
* SF-36: Quality of life scale and function from 0 to 100 points. However, only the function segment was used, less score, better function
* WOMAC: Scale of function 0 to 96 points, less score better function.

**The risk WITHOUT cane is based on the risk in the control group of the trials. The risk WITH contralateral cane (and its margin of error) is calculated from relative effect (and its margin of error).

[1] The certainty of the evidence was downgraded one level for imprecision, since each end of the confidence interval leads to a different decision. In the case of function, it was decided to decrease two levels since in one of the scales (WOMAC) the function worsens considerably.
[2] Based on an observational study
[3] The certainty of the evidence was downgraded one level since the study is not blind and has no follow-up but is an isolated measurement [5].

Follow the link to access the interactive version of this table (Interactive Summary of Findings – iSoF)

About the certainty of the evidence GRADE)*

⊕⊕⊕⊕
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.

⊕⊕◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

* This concept is also called 'quality of the evidence' or 'confidence in effect estimates'.

† Substantially different = a large enough difference that it might affect a decision

Other considerations for decision-making

To whom this evidence does and does not apply

The evidence contained in this summary is applicable to adult patients with symptomatic knee osteoarthritis.

It is not applicable to patients with acute or chronic knee pain from another cause, or to patients with symptomatic osteoarthritis of other joints.

About the outcomes included in this summary

The outcomes included in the results summary table are those considered critical for decision making by the authors of this summary.

Although some systematic reviews considered peak knee adduction moment as a relevant outcome and some clinicians might think in the same way, these outcomes are now known as surrogate outcomes[10]. The report of these outcomes is made when there is an absence of information on clinically relevant outcomes, since the use of surrogate outcomes in decision making entails a risk of incorrect decisions. However, the authors of this summary decided to analyze it, obtaining a certainty of the very low evidence, since the outcome presented limitations due to the risk of bias, imprecision, and inconsistency.

Balance between benefits and risks, and certainty of the evidence

Among the benefits of cane use, it is highlighted that it probably decreases the pain (moderate certainty) and could have a slight effect on function (low certainty).

In turn, the adverse effects of cane use have not been systematically evaluated, and although there are theories showing kinetic and kinematic changes in other joints of the lower extremities, the clinical implications of these changes are not defined.

Due to the absence of the measurement of adverse effects, it is difficult to make an adequate risk/benefit balance.

Resource considerations

No studies were found that evaluated the cost-benefit of this intervention. However, it is a low-cost and widely available technical aid.

What would patients and their doctors think about this intervention

Faced with the available evidence, it is expected to find variability in the decision of the different patients and physicians. Although there may be pain reduction and there are clinical guidelines that recommend its use, there is uncertainty about the adverse effects, so its indication should be individualized and supervised.

One study[9] evaluated the factors that influence the use of a cane in patients with osteoarthritis of the knee. This study, which uses a behavioral change approach, found that older people, with a higher body mass index, a longer duration of knee pain and more intense pain when walking, tend to prefer using the cane.

It could be considered as an option in patients in whom other therapeutic options are not being considered, or as a complement to other therapeutic options with greater evidence.

Differences between this summary and other sources

The revised systematic reviews do not make specific recommendations regarding the use of canes due to the limited available evidence, which is consistent with the results obtained.

The International Society for the Study of Osteoarthritis (OARSI)[11] recommends the use of a cane in patients with osteoarthritis of the knee, without osteoarthritis in other joints based on the results of the mentioned randomized trial[5]. The American Academy of Orthopedic Surgery (AAOS) does not refer to the use of canes[12].

Could this evidence change in the future?

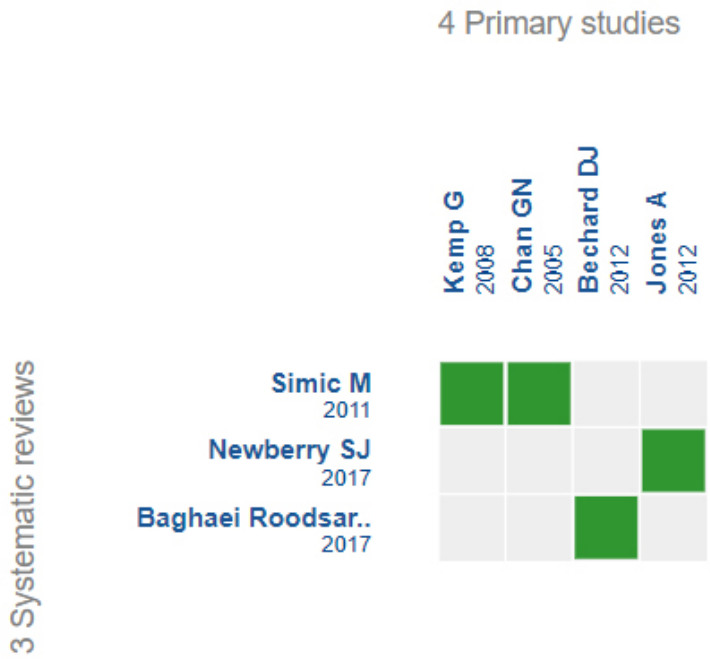
The probability that the conclusions of this summary will change in the future varies depending on each outcome, with the probability of walking speed and adverse effects being high. On the other hand, the probability that the results change is less in function and pain.

We identified an ongoing systematic review in International Prospective Register of Systematic Registries (PROSPERO) that assesses changes in maximum moment of adduction of the knee from interventions that modify gait, including the use of a cane[13].

We identified two randomized trials underway in the International Clinical Trials Registry Platform of the World Health Organization, one that evaluates maximum vertical force in patients with osteoarthritis of the knee[14] and another in relation to pain and function with the use of walking sticks[15].

How we conducted this summary

Using automated and collaborative means, we compiled all the relevant evidence for the question of interest and we present it as a matrix of evidence.



Starting from any systematic review, Epistemonikos builds a matrix based on existing connections in the database.
The author of the matrix can select relevant information for a specific health question (typically in PICO format) in order to display the information set for the question.
The *rows* represent systematic reviews that share at least one primary study, and *columns* display the studies.
The boxes in green correspond to studies included in the respective reviews.

Follow the link to access the interactive version: Canes for knee osteoarthritis

Notes

The upper portion of the matrix of evidence will display a warning of "new evidence" if new systematic reviews are published after the publication of this summary. Even though the project considers the periodical update of these summaries, users are invited to comment in *Medwave* or to contact the authors through email if they find new evidence and the summary should be updated earlier.

After creating an account in Epistemonikos, users will be able to save the matrixes and to receive automated notifications any time new evidence potentially relevant for the question appears.

This article is part of the Epistemonikos Evidence Synthesis project. It is elaborated with a pre-established methodology, following rigorous methodological standards and internal peer review process. Each of these articles corresponds to a summary, denominated FRISBEE (Friendly Summary of Body of Evidence using Epistemonikos), whose main objective is to synthesize the body of evidence for a specific question, with a friendly format to clinical professionals. Its main resources are based on the evidence matrix of Epistemonikos and analysis of results using GRADE methodology. Further details of the methods for developing this FRISBEE are described here (http://dx.doi.org/10.5867/medwave.2014.06.5997)

Epistemonikos foundation is a non-for-profit organization aiming to bring information closer to health decision-makers with technology. Its main development is Epistemonikos database

www.epistemonikos.org.

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