



Review Article

Topical capsaicin for pain in osteoarthritis: A literature review



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ABSTRACT

Osteoarthritis is the most common joint disorder worldwide. The predominant symptom, pain, is usually treated with acetaminophen or oral non-steroidal anti-inflammatory drugs, although they are associated with a significant risk of side effects. Topical capsaicin may represent an effective and safe alternative.

The aim of this review is to examine the evidence for the efficacy and safety profile of topical capsaicin in the management of pain caused by osteoarthritis. Databases were searched for articles published between 2004 and 2016, in Portuguese, English or Spanish, using the search terms “capsaicin” and “osteoarthritis”. When compared to placebo, it was found that topical capsaicin has a good safety profile and efficacy in reducing osteoarthritis pain of the hand, knee, hip or shoulder. However, the studies have significant limitations, the most important the difficulty of blinding. It is attributed to this review the strength of recommendation B.

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Capsaicina tópica para el dolor de la osteoartritis: una revisión de la literatura

RESUMEN

La osteoartritis es la enfermedad articular más común mundialmente. El síntoma predominante, el dolor, se trata generalmente con paracetamol oral o antiinflamatorios no esteroideos, a pesar de que están asociados con un riesgo significativo de efectos secundarios. Capsaicina tópica puede representar una alternativa eficaz y segura.

El objetivo de esta revisión es examinar la evidencia disponible acerca de la eficacia y del perfil de seguridad de la capsaicina en el tratamiento del dolor. Se realizaron búsquedas en bases de datos de artículos publicados entre 2004 y 2016, en portugués, inglés o español, utilizando los términos «capsaicina» y «osteoartritis». En comparación con el placebo, la capsaicina tiene un buen perfil de seguridad y eficacia en la reducción del dolor de la osteoartritis de la mano, la rodilla, la cadera o el hombro. Sin embargo, los estudios tienen limitaciones significativas, principalmente la dificultad de cegamiento. Se atribuye a esta revisión una fuerza de recomendación B.

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Palabras clave:

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Introduction

Osteoarthritis (OA) is the most common joint disorder worldwide.¹ It is estimated that approximately 18% of women and 10% of men above 60 years old have symptomatic OA and that more than 50% of people over the age of 65 have radiological evidence

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of OA.^{2–4} Ageing populations are expected to make OA the fourth leading cause of disability by the year 2020.⁴

The management of OA ranges from non-pharmacologic interventions and drugs to surgical approach.^{5–8} With no current cure for OA, treatment is directed towards reducing pain and stiffness, improving joint mobility and quality-of-life and preventing progression of disease.^{5,9,10} Non-pharmacologic interventions are the primary approach to the management of OA.¹⁰ Physical exercise, weight loss, physiotherapy and patient education are some of the proposed interventions.^{6,10} Pharmacologic treatment should be considered when pain or functional status does not respond to non-pharmacologic interventions.^{6,10} Acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs) are the most used drugs.^{6,10} However, high doses of acetaminophen are associated with liver toxicity and oral NSAIDs increase the risk of gastrointestinal and renal adverse effects.^{6,10,11}

Topical agents, such as NSAIDs and capsaicin are valuable choices when systemic side effects of some drugs are not acceptable.^{6,11,12} Capsaicin is the neurotoxin of chilli peppers and it is the compound that makes them taste “hot”.¹³ It binds selectively to the vanilloid compound receptor (TRPV1) of type C afferent fibres and increases P substance in synaptic cleft.^{13,14} While first applications of capsaicin are associated with a burning sensation over the applied surface, after continued use, persistent desensitization and analgesia occurs both due to P substance neural depletion and reversible and selective destruction of primary afferent fibres.^{13–15} The selective neuronal destruction assumes greater importance in OA due to the abundance of nociceptive fibres on joint cartilage.¹⁶ The main indications of capsaicin are the treatment of pain from post-herpetic neuralgia, diabetic neuropathy, rheumatoid arthritis and OA.^{12,13} Capsaicin presents a good safety profile. Local skin irritation and burning sensation, the two most important side-effects, are commonly identified in about 40% of patients.¹³ Besides its potential benefit over other drugs, capsaicin still faces great reluctance in medical community due to doubts about its therapeutic efficacy.

The purpose of this article was to review the evidence regarding the efficacy and safety profile of topical capsaicin in the treatment of pain from OA.

Methods

Search strategy

The following electronic databases were searched: National Guideline Clearinghouse, Canadian Medical Association Practice Guidelines Infobase, Evidence-based Medicine Guidelines, National Institute for Health and Care Excellence, Royal College of Physicians, The Royal Australian College of General Practitioners, The Cochrane Library, DARE, Bandolier, Medline, TRIP database and Index of Portuguese Medical Journals. The following keywords were applied as search terms: “capsaicin” and “osteoarthritis”.

Selection criteria

Guidelines, meta-analysis, systematic reviews and randomized controlled trials (RCTs), published between January 2004 and January 2016, in Portuguese, English or Spanish, were searched. We included articles whose population have been diagnosed with OA, not undergoing arthroplasty. Any form of topical capsaicin (gel, cream, ointment, solution), used alone and compared with a control (placebo or no treatment at all) was included. The measured outcome was the reduction of pain. Secondary outcome included any adverse reaction.

Exclusion criteria were: disagreement with the goal of review; duplicate publication; opinion manuscripts and consensus guidelines; classical review papers and summaries of websites; clinical trials included in recent systematic reviews; and systematic reviews with the same total RCTs as the latest review articles.

Study selection

Two investigators independently assessed the titles of the articles found and excluded duplicates and those clearly irrelevant. Abstracts of the selected articles were examined independently by the two reviewers who applied the selection criteria. If the information in the abstracts was not enough, full papers were analyzed to make a decision. Where disagreements of selections arose, these were discussed until consensus was reached.

Data extraction

Data were extracted from each eligible study by a single reviewer and checked by the second reviewer. The data items extracted were: number of trials included; number of persons recruited to the trials; type of intervention and control; length of follow-up; evaluated endpoint; results achieved in efficacy and safety; final recommendations.

Evaluation of evidence

To evaluate the level of evidence and the strength of recommendation, the Strength of Recommendation Taxonomy (SORT) of the American Academy of Family Physicians was used.¹⁷ When the classification was based on other grading scales, we described its meaning.

Results

A total of 120 studies were found, and, from these, 114 were excluded and 6 fulfilled the inclusion criteria: three systematic reviews and three guidelines.

Excluded studies were mainly duplicates, studies on diseases other than OA, study designs other than guidelines, meta-analysis, systematic reviews and RCTs, studies of other drugs or of complementary medicines such as acupuncture, studies whose control was active, systematic reviews with the same total RCTs as the latest review articles and studies on animals. [Fig. 1](#) describes the process of identification of relevant studies. All studies included are summarized in [Tables 1 and 2](#).

Systematic reviews

The systematic review of Cameron et al.¹⁸ ([Table 1](#)) included thirty-five RCTs that examined the effects of herbal medicinal products in patients diagnosed with OA according to the American College of Rheumatology (ACR) criteria. Five RCTs ($n=456$) compared the analgesic effect of topical capsaicin (0.025% or 0.075%, four times daily) in OA of the hand, knee or multiple joints (hip, knee, shoulder and hand) with placebo. All studies assessed pain (four of them by visual analogue scale – VAS), with similar and consistent results among themselves after three to four weeks of treatment. After three weeks the mean difference (MD) was –18.50% in terms of VAS percentage changes, with a confidence interval (CI) reported at 95% of –40.95 to 3.95. After four weeks, the results were similar (MD –13.90%, CI –32.39 to 4.59). Absolute VAS pain scores after three to four weeks were in favour of capsaicin as well. Thus, topical capsaicin, applied four times daily

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