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Original Article

Pre-operative Predictive Factors of Post-operative Pain in Patients With Hip or Knee Arthroplasty: A Systematic Review[☆]

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ABSTRACT

Objective: To analyze pre-surgical predictive factors of post-surgical pain in patients undergoing hip or knee arthoplasty.

Methods: A systematic literature review was performed. We defined a sensitive strategy on Medline, Embase and Cochrane Library up to May 2013. The inclusion criteria were: patients undertaking knee and/or hip arthroplasty, adults with moderate or severe pain (≥4 on a Visual Analog Scale) in whom predictive factors of post-surgical pain were evaluated before surgery. Systematic reviews, meta-analyses, controlled trials and observational studies were selected. We excluded animals and basic science articles, reviews of prosthesis, prosthesis due to fractures, patients with rheumatic diseases or studies with mixed population in which disaggregated data was not possible to obtain.

Results: A total 37 articles of moderate quality were selected. The articles included representative patients undergoing a knee or hip arthroplasty in our country; most of them were aged 60 years or above, with osteoarthritis, and with a high rate of obesity and comorbidities. We found great variability regarding the type of studies and predictive factors. There was a strong association between post-surgical pain and the following pre-surgical factors: female gender, low socio-economic status, higher pain, comorbidities, low back pain, poor functional status, and psychological factors (depression, anxiety or catastrophic pain).

Conclusions: There are pre-surgical factors that might influence post-surgical pain in patients undergoing a knee or hip arthroplasty. Therefore, they should be taken into account when considering an arthroplasty.

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Factores predictores prequirúrgicos de dolor posquirúrgico en pacientes sometidos a artroplastia de cadera o rodilla. Una revisión sistemática

RESUMEN

Objetivo: Analizar los factores prequirúrgicos que pueden tener efecto sobre los niveles de dolor posquirúrgico en pacientes que van a ser sometidos a una artroplastia de cadera (ATC) o rodilla (ATR).

Métodos: Revisión sistemática de la literatura. Se definió una estrategia de búsqueda sensible en Medline, Embase y Cochrane Library hasta mayo de 2013; se definió la población con los siguientes criterios: pacientes adultos con indicación de ATC o ATR y en los que se identificasen factores predictores prequirúrgicos de dolor posquirúrgico. Se incluyeron revisiones sistemáticas, metaanálisis, ensayos clínicos y estudios observacionales. Se excluyeron estudios en animales, ciencia básica, estudios sobre revisiones de prótesis, prótesis por fracturas, pacientes que tenían una enfermedad inflamatoria articular de base (artritis reumatoide, lupus, etc.) o estudios con población mixta donde fue imposible desagregar datos.

Resultados: Se seleccionaron 37 artículos de calidad moderada. Incluían pacientes representativos de aquellos a los que se les indica una ATC o ATR en nuestro país, la gran mayoría tenían artrosis de rodilla

y/o cadera y más de 60 años, muchos obesos y con comorbilidades. Existe una gran variabilidad en el tipo de estudios y factores estudiados. Se encontró una fuerte y consistente asociación con mayor dolor posquirúrgico de los siguientes factores prequirúrgicos: el sexo femenino, el bajo nivel socioeconómico, un mayor nivel de dolor preoperatorio, la presencia de comorbilidades o dolor lumbar, un peor estado funcional preoperatorio, la presencia de factores psicológicos (depresión, ansiedad o catastrofismo).

Conclusiones: Existen factores prequirúrgicos que pueden influir en la presencia de dolor posquirúrgico en pacientes sometidos a ATC y/o ATR que deben tenerse en cuenta en el momento de la indicación y hasta que se realiza la misma.

Introduction

Total knee arthroplasty (TKA) or total hip arthroplasty (THA) can bring about an enormous improvement in terms of pain relief and restored function in the patients who undergo these interventions to treat osteoarthritis (OA), with the resulting improvement in quality of life,[1,2] and, thus, are considered among the most relevant surgical advances of the 20th century.[3] However, this effect is not obtained in all the patients in which this surgical technique is performed.[4] In fact, up to 30% of the patients who undergo these procedures in Spain report no substantial improvement in their quality of life one year after surgery.[5]

A number of studies have suggested that certain preoperative factors may have an effect on these outcomes. In general, both in THA and TKA, the best results (at least with respect to function and prosthesis survival) are obtained in patients between 45 and 75 years of age, with strong social support and a high level of education, without overweight/obesity, with better preoperative function and no comorbidities, among other characteristics.[6–8] When the effect on postoperative pain is analyzed, other studies mention factors related to the patient, the surgical technique and other aspects that are associated with greater pain after surgery.[9] However, there is no critically evaluated information in this respect, especially concerning chronic postoperative pain.

Our objective was to carry out a systematic and critical review of the available literature to identify possible preoperative factors that have an impact on postoperative pain in patients in whom THA or TKA is indicated. Although the size of the effect of these possible factors cannot be analyzed in depth, simply identifying them may be of great help to practicing clinicians in making decisions regarding hip and knee replacements.

Materials and Methods

We carried out a systematic review of the literature in accordance with the recommendations of the Cochrane Collaboration.[10]

Study Selection Criteria

We selected studies that included adult patients in whom THA and/or TKA was indicated. Moreover, these studies should analyze preoperative predictive or determining factors for postoperative pain such as: age, sex, level of education, socioeconomic status, race, profession, underlying disease (type, duration, etc.), comorbidity, body mass index (BMI), level of self-care ability, quality of life, preoperative pain level (intensity, duration, etc.), surgeon-related factors (age, sex, experience), waiting list, type of hospital, expectations, depression, anxiety, etc. Finally, only studies with the following designs were included: meta-analyses, systematic reviews, clinical trials or observational studies.

Animal studies, basic science studies, studies on prosthesis revisions or prostheses to treat fractures were excluded, as were studies in which all the patients had an underlying inflammatory joint disease (rheumatoid arthritis, lupus, etc.) or that provided data only on these patients, and studies involving a mixed study population, but in which it was impossible to dissociate this subpopulation.

Search Strategy

For this review, we screened the following bibliographic databases: MEDLINE (from its inception to May 2013), EMBASE (from its inception to May 2013) and the Cochrane Library (from its inception to May 2013). Given the volume of literature that we expected to find, we decided, on the one hand, to include those articles in which the analysis had been adjusted for those factors that might influence the association and, on the other, not to search in the gray literature (abstracts from Spanish and international congresses). Subsequently, we carried out a secondary hand search of references from the articles that ultimately were included in the systematic review.

The strategies used in the MEDLINE search, as well as the number of citations retrieved, are shown in Table 1. For this purpose, we utilized MeSH terms and free-text terms. The search was limited to articles in humans and in English or Spanish.

Study Selection

Two reviewers independently analyzed the articles resulting from the search strategy in the three bibliographic databases, selected those that met the defined criteria and analyzed the included articles in depth. When there was disagreement, a third person, in this case, an expert methodologist, resolved the problem. First, the results of the search were refined according to the title and abstract, or the entire article when there was no abstract, in sessions with a maximum duration of 20 min. After this process, the selected articles were analyzed in depth (a reading of the entire article). Figure 1 shows the flowchart corresponding to the article selection process.

Finally, we performed a manual search for the works included in the reference lists of the articles selected for in-depth analysis. All the references were retrieved from the Internet and stored in the EndNote program to facilitate their use.

Data Collection and Appraisal of the Quality of the Studies

The two reviewers extracted the data from the selected studies using specific templates predesigned for this review. To evaluate the methodological quality of the studies included, they used the Oxford quality scale.[11]

Data Analysis and Presentation

We created evidence tables to describe the main features of the selected studies. Some of the results are expressed as number and percentage (%), mean and standard deviation, median and interquartile range (P25–P75), and others as odds ratio, relative risk