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Evaluating best evidence in occupational therapy for patients with hip replacement: guidelines

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ABSTRACT. Object. *The following study was carried out in order to evaluate through guidelines the best evidence in occupational therapy for daily activities and quality of life of patients with hip prostheses.*

Methods. *Recommendations were generated following the grading method of the National Program for Guidelines/National System Guidelines (PNLG-SNLG), a system for developing guidelines for recommendations in clinical practice. The Appraisal of Guidelines Research & Evaluation in Europe (AGREE) tool was also applied.*

Results. *A total of seven studies were included in this research: one randomized controlled trial, two systematic reviews, two outcomes research studies, and two observational studies.*

We found that, for the three clinical questions we proposed, more research on the effectiveness of treatments is required.

Conclusions. *The evidence resulting from this study is not sufficient to determine whether the rehabilitation techniques under consideration are effective.*

Key words: Hip replacement, rehabilitation, ADL, aids.

RIASSUNTO. *Obiettivo.* Il seguente studio è stato condotto al fine di valutare attraverso linee guida le migliori evidenze in terapia occupazionale per le attività di vita quotidiana e la qualità della vita dei pazienti con protesi d'anca.

Metodi. Le raccomandazioni sono state generate seguendo il metodo di classificazione del National Program for Guidelines/National System Guidelines (PNLG-SNLG), un sistema per lo sviluppo di linee guida per le raccomandazioni nella pratica clinica. È stato inoltre applicato lo strumento Appraisal of Guidelines Research & Evaluation in Europe (AGREE).

Risultati. In questo studio è stato incluso un totale di sette studi: uno studio randomizzato controllato, due revisioni sistematiche, due outcomes research e due studi osservazionali. Abbiamo trovato che, per le tre domande cliniche che abbiamo proposto, sono necessarie ulteriori ricerche sull'efficacia dei trattamenti.

Conclusioni. Le evidenze risultanti da questo studio non sono sufficienti per determinare se le tecniche riabilitative in esame sono efficaci.

Parole chiave: protesi d'anca, riabilitazione, AVQ, ausili.

Introduction

According to *The Global Burden of Disease: Generating Evidence, Guiding Policy*, a report published in 2013 by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, musculoskeletal disorders are second only to mental illness and behavior disorders in terms of global impact on patient health (1-3).

The report published by IHME emphasizes that musculoskeletal disorders are among the ten main causes of disability in the majority of regions around the world, and that osteoarthritis, in particular, is among the top twenty causes of disability in all regions, except central Sub-Saharan Africa. The impact of these numbers on national healthcare systems is clear, and costs related to the increasing use of prostheses continue to rise. According to the *Health at a Glance 2013* report published by the Organization for Economic Cooperation and Development (OECD), Switzerland, Germany, and Austria had the highest rates of hip replacement in 2011. The USA, followed by Germany and Switzerland, had the highest rates of knee replacement (4).

In most OECD countries, the number of hip and knee prosthetic substitutions has risen sharply over the last ten years: between 2000 and 2011, the rate of hip replacement rose by 30%, on average, while the rate of knee replacement rate grew even more sharply, doubling over the last decade (1-3).

The increasing demand for total hip replacement (THR) surgery has resulted in a corresponding rise in revision surgeries; in 2011 a total of 8641 THR revision (RTHR) procedures were performed across England, Wales and Northern Ireland, whereas 9516 were completed in 2014 (National Joint Registry (NJR), 2015). This trend will be intensified by the increase in the volume of RTHRs, which is projected to be up to 31% by 2030 (4).

The fourth 2017 annual report from the Italian Register of Arthroprostheses (IRAP), after analyzing data from the HDC (Hospital Demission Card) Database related to demission year 2015, gives the results of the HDC Database search history about the national prosthetic surgeries during the period 2001-2015 and describes the hospitalization for hip, knee and shoulder replacement surgeries (5).

The analysis has been split in two time periods: years 2001-2015 and year 2015. Regarding data for 2001-2015 from the HDC archive, the incidence (over 100,000 inhabitants) of elective hip replacement surgeries is rising, as well as the incidence of primary emergency hip replacement surgeries (at a lesser rate), while the incidence of the revision hip replacement surgeries remains unchanged. These trends are in line with the average OECD (Organization for Economic Co-operation and Development) countries, although national data are globally influenced by great variations on a regional level. Taking into account all age classes, the age class 55-64 went from an incidence of about 100 in 2001 to an incidence of over 150 in 2015 (5).

Regarding data for 2015 from the HDC archive, the total number of both primary and revision hip replacement surgeries was over 100,000, with an increase of 3.5% in elective procedures and of 2.5% in emergency procedures compared to the previous year. Examining demographic data, it has been observed that there is a considerable amount of men aged below 45, while this type of surgery has the highest average age above all the others for women, as a significant amount is aged above 85 years (20.2%). As expected, in the last four years the ratio between elective and emergency surgeries has remained constant; the prostheses mechanical loosening is the most frequent cause for hip replacement surgeries.

Currently, hip replacement surgery is widely used as a solution for disabling disorders such as arthrosis, arthritis, and femoral neck fractures. Patients who undergo this kind of surgery achieve significant reductions in pain and improvements in quality of life, and they are able to ambulate autonomously again (6,7).

In literature it is clear the necessity for the development and implementation of guidelines to optimize hip replacement rehabilitation. Thus, the aim of this study is to evaluate the best evidence in occupational therapy for patients with hip prostheses by analyzing outcomes relative to activities of daily living and quality of life.

Methods

We generated recommendations in accordance with the PNLG-SNLG (8) grading system for the development of clinical practice guideline recommendations. Specifically, for each study, we rated the importance of its outcomes (*Trial analysis*), evaluated the level of confidence in its findings (*Trial results*), and graded its recommendations (*Recommendation grade*). For clinical practice guidelines, we applied the AGREE (9) appraisal tool (Table II).

Composition and organization of the panel

A working group of seven members was assembled under the auspices of the ROMA (Rehabilitation & Outcome Measures Assessment) Association. (10-28) The group consisted of two physiotherapists (G.G. and M.R.), four occupational therapists (A.M., P.S., D.R., and T.M.) and an English language expert (F.T.). We developed the

guidelines through a series of eight meetings and extensive email correspondence between March 2017 and September 2017.

Management of conflicts of interest

The authors declare the absence of any conflict of interest.

Development of the guidelines

When developing the guidelines, we determined the relevant outcomes for patients. For the process of defining the importance of each outcome or result, we followed the GRADING PNLG-SNLG process (Table I). A web search was carried out on relevant sites, such as PubMed, Scopus, OTseeker, Cochrane, and Web of Science, using the search terms (Hip replacement OR Arthroplasties OR Replacement OR Hip) OR (Arthroplasty OR Hip Replacement OR Hip Prosthesis Implantation OR Hip Prosthesis Implantations) OR (Implantation OR Hip Prosthesis OR Implantations OR Hip Prosthesis OR Prosthesis Implantation OR Hip) OR (Prosthesis Implantations OR Hip OR Hip Replacement Arthroplasty OR Replacement Arthroplasties OR Hip) OR (Replacement Arthroplasty OR Hip OR Arthroplasties OR Hip Replacement OR Hip Replacement Arthroplasties) OR (Hip Replacement OR Total OR Replacement OR Total Hip OR Hip Replacements OR Total) OR (Replacements OR Total Hip OR Total Hip Re-

Table I. Trial levels and grades of recommendation

Trial levels	
1++	High-quality meta-analysis, RCT systematic revisions, or very low-bias RCTs
1+	Good-quality meta-analysis, systematic revisions, or low-bias RCTs
1-	Meta-analysis, systematic revisions, or high-bias RCTs
2++	High-quality systematic revisions for case-control studies or cohort studies; high-quality case-control studies or cohort studies, with very low confounding risk or very low bias and a high chance of causal relationship
2+	Good-quality case-control studies or cohort studies, with low confounding risk or low bias and a moderate chance of causal relationship
2-	Case-control studies or cohort studies with high confounding risk or high bias and a low chance of causal relationship
4	Non-analytical studies, such as case reports or case series
4	Expert opinion
Grades of recommendation (minimum requirements)	
A	A meta-analysis: valid alternatives are a systematic revision, a level 1++ RCT directly applicable to the target population, or a body of proof consisting in level 1+ studies directly applicable to the target population and with high homogeneity of results
B	A body of proof including level 2++ studies directly applicable to the target population and with high homogeneity of results; alternatively, evidence from level 1++ or level 1+ studies
C	A body of proof including level 2+ studies directly applicable to the target population and with high homogeneity of results; alternatively, evidence from level 2++ studies
D	Level 3 or 4 evidence; alternatively, evidence from level 2+ studies
GPP	Good Practice Point) Recommendations for good clinical practice based on the multidisciplinary panel's clinical experience

placements OR Total Hip Replacement) AND (Rehabilitation). From the search results, one randomized control trial (RCT), two systematic reviews, two outcome research studies, and two observational studies were deemed to be relevant.

Results

Seven studies (Figure 1) were deemed through research to be relevant to our three proposed clinical questions regarding the efficacy of aids, changes in activities of daily living, and anti-dislocation rules:

- one RCT: “The Effectiveness of Occupational Therapy Supervised Usage of Adaptive Devices on Functional Outcomes and Independence after Total Hip Replace-

ment in Iranian Elderly: A Randomized Controlled Trial”

- two systematic reviews: “Assistive Devices, Hip Precautions, Environmental Modifications and Training to Prevent Dislocation and Improve Function after Hip Arthroplasty” and “Adaptive Equipment Used in the Rehabilitation of Hip Arthroplasty Patients”
- two observational studies: “UK Survey of Occupational Therapists’ and Physiotherapists’ Experiences and Attitudes towards Hip Replacement Precautions and Equipment” and “Rehabilitation Following Total Hip Arthroplasty”
- two outcome research studies: “Use of Aids during the First Three Months After Total Hip Replacement” and “Early Dislocation After Total Hip Arthroplasty: Are Postoperative Restrictions Necessary?”

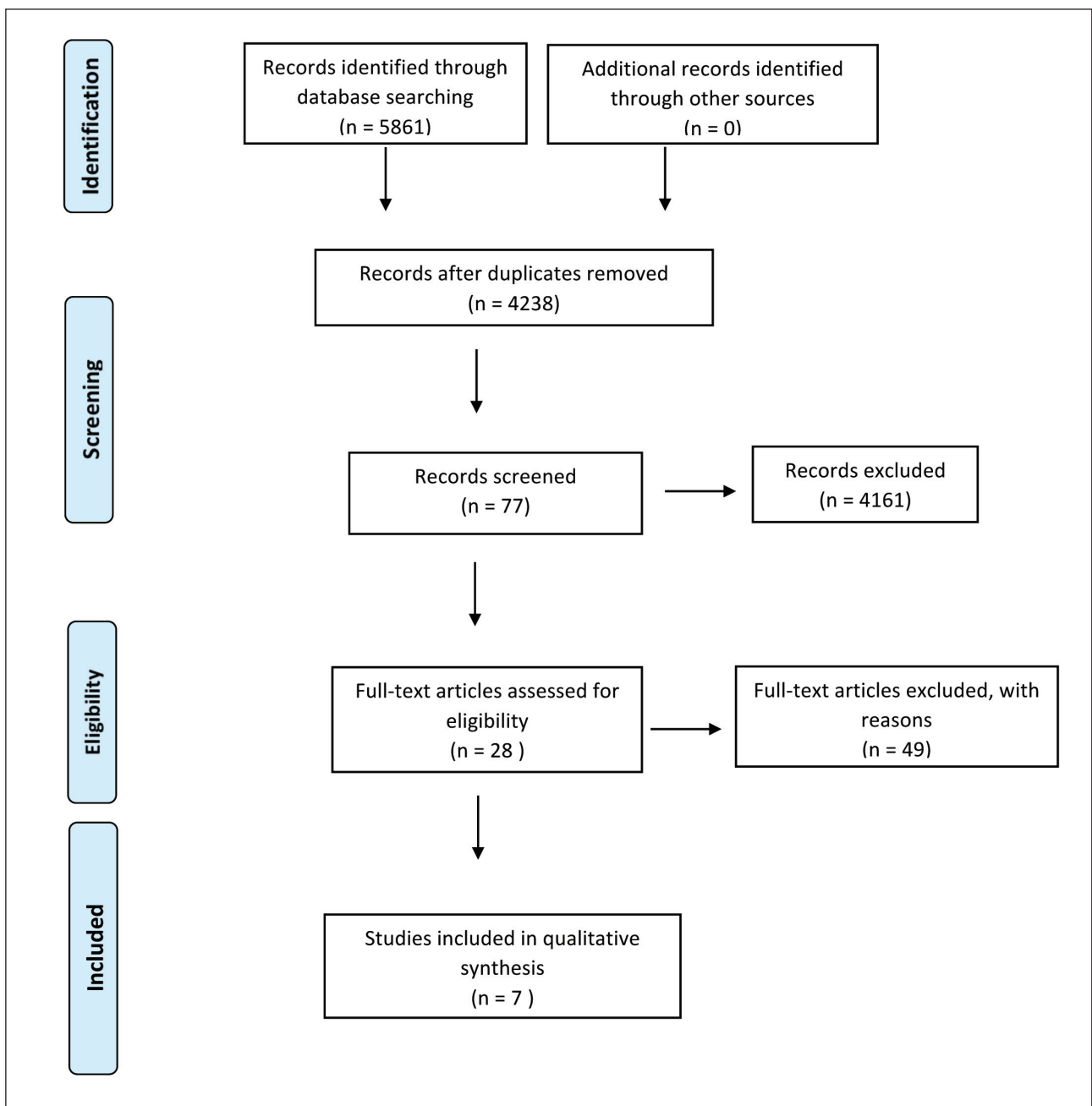


Figure 1. Flow-chart

We evaluated each of the relevant studies in terms of their ability to answer our three clinical questions.

QUESTION 1

Is there any evidence to support the effectiveness of aids in improving quality of life for patients with hip prostheses?

Trial analysis

Trials concerning the effectiveness of aids for patients with hip prostheses show discordant results. According to the RCT and the systematic reviews, the use of aids improves independence, physical function, and quality of life in patients with hip prostheses. According to the outcome research studies, the use of bathroom and ambulation aids for two weeks after discharge is also useful, but the same cannot be said of aids for dressing and personal hygiene. Furthermore, according to the observational study from Biomed Central, more research is needed on the effectiveness of providing such aids, as current practice is not based on scientific evidence (29-33).

Trial results

The results obtained show that studies of higher quality are necessary for evaluating the effectiveness of aids. It was therefore difficult to make firm recommendations about the use of aids.

Recommendation grade: B

For patients with hip prostheses, the use of aids improves independence in activities of daily living and quality of life.

QUESTION 2

Is there any evidence supporting the effectiveness of changes in activities of daily living for improving independence in patients with hip prostheses?

Trial analysis

Analysis of the effectiveness of changes in activities of daily living, as reported in the second of the systematic reviews under consideration, indicates some improvement in levels of patient independence in activities of daily living. However, given the scarcity of evidence in support of this practice, further studies are necessary (29).

Trial results

The results obtained show that studies of higher quality are necessary in order to evaluate the effectiveness of changes in activities of daily living in improving the independence level of patients with hip prostheses.

Recommendation grade: A

Changes in activities of daily living improve levels of independence in patients with hip prostheses.

Question 3

Is there any evidence to support the effectiveness in preventing dislocations of anti-dislocation rules for patients with hip prostheses?

Trial analysis

The results show that no evidence is currently available to support this practice. In the first of the systematic reviews under consideration, the effectiveness of anti-dislocation rules in preventing prosthesis dislocation is questioned; in both the observational studies under consideration, further investigation is advised. The outcome research studies suggest that the use of an anterolateral approach without postoperative movement restrictions leads to a very low early dislocation rate and eliminates any late dislocation. However, the low incidence rates do not allow the identification of factors that might influence postoperative dislocation rates (31-35).

Trial results

According to the results obtained, studies of higher quality are necessary in order to evaluate the effectiveness of anti-dislocation rules in preventing hip dislocation and in improving quality of life for patients with hip prostheses.

Recommendation grade: A

A multifactor intervention (provision of aids, hip precautions, and environmental modifications) prevents dislocation and improves physical function.

KEY POINTS

- Postoperative evaluation of patients with hip prostheses should include an evaluation of their levels of independence and function. This evaluation should determine the supply of aids. Furthermore, correct positioning, obtained with specific posture and aids, both in a bed and on a wheelchair, is necessary to avoid postoperative complications.
- Whenever there is no reason to advise against it, all patients should use different types of aids, including dressing aids and personal hygiene aids, in order to improve their level of functional independence.
- In order to avoid postoperative complications and dislocation, all patients should follow anti-dislocation rules: they should avoid certain movements, such as hip flexion greater than 90 degrees, intra- or extra-rotation of the hip greater than 20 degrees, and abduction over the median line. Furthermore, it is advisable to avoid resting on the side of the replaced hip.
- There is currently a lack of literature to support the use of the aforementioned occupational therapy interventions to improve quality of life for patients who have undergone hip replacement surgery. Further studies are therefore necessary.

Limits of the study

This study has certain limitation, determined by lackness in scientific evidence. The main limitation of this guideline depends on absence in literature of randomized control trial, and studies with big samples and follow-up, this impairs reproducibility of results.

Conclusions

We can conclude that the number of occupational therapy studies for patients with hip prostheses is relatively small, and that there is confusion about the role of

occupational therapists and the effectiveness of treatments. Therefore, further studies are necessary in order to gather more scientific evidence that could either confirm or deny the effectiveness of current practices. This study lays the basis for scientific research to address an emerging topic in rehabilitation medicine. The independence and quality of life, represents the measurable outcome to be pursued for all patients, and in particular for the aging population. In this regard, occupational therapy, with its methods and procedures, described the instrument of choice in the hands of rehabilitation medicine. This work produced underlines the need to continue producing evidence to demonstrate its effectiveness.

Execution

The execution of these guidelines will be carried out through publication of the current article and the relevant studies in the *Advances in Orthopedics*. The guidelines will be revised every three years, when a revision plan for new provisional trials and an update of existing recommendations will be provided.

Other guidelines

No other guidelines are currently available.

Recommendations for further research

In light of the results obtained, further research is necessary in order to evaluate the effectiveness of aids in improving the quality of life for patients with hip prostheses, the effectiveness of modifications to activities of daily living in improving patient independence, and the effectiveness of anti-dislocation rules in preventing dislocation.

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