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Cost-utility of exercise therapy in patients with hip osteoarthritis in primary care

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S U M M A R Y

Objective: To determine the cost-effectiveness (CE) of exercise therapy (intervention group) compared to 'general practitioner (GP) care' (control group) in patients with hip osteoarthritis (OA) in primary care.
Method: This cost-utility analysis was conducted with 120 GPs in the Netherlands from the societal and healthcare perspective. Data on direct medical costs, productivity costs and quality of life (QoL) was collected using standardised questionnaires which were sent to the patients at baseline and at 6, 13, 26, 39 and 52 weeks follow-up. All costs were based on Euro 2011 cost data.
Results: A total of 203 patients were included. The annual direct medical costs per patient were significantly lower for the intervention group (€ 1233) compared to the control group (€ 1331). The average annual societal costs per patient were lower in the intervention group (€ 2634 vs € 3241). Productivity costs were higher than direct medical costs. There was a very small adjusted difference in QoL of 0.006 in favour of the control group (95% CI: −0.04 to +0.02).
Conclusion: Our study revealed that exercise therapy is probably cost saving, without the risk of noteworthy negative health effects.
Q4 Trial registration number: NTR1462.

Introduction

Osteoarthritis (OA) is the most common joint disease causing pain and disability of especially hip and knee joints. The incidence of hip OA increases from age 55 and is higher for women than for men[1]. The most typical symptoms of hip OA are hip pain and disability due to e.g., reduced lower limb muscle strength[2,3]. The general practitioner (GP) is the initial caregiver involved, in many cases providing the patient with education and counselling, pain medication, referral to an orthopaedic surgeon and/or additional diagnostic examinations (GP care). As exercise therapy has been shown to reduce pain and improve physical functioning in patients with hip OA[4], international guidelines additionally recommend exercise therapy as part of the treatment[5].

Although recommendations for the treatment of hip OA are mainly based on knee OA studies, few studies have previously evaluated the effectiveness of exercise therapy in hip OA. Hernandez-Molina *et al.* reported that the most effective therapeutic exercise involves regular aerobic activity and/or a strengthening program[4]. As the beneficial effects of exercise therapy lasting

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up to 12 weeks seem to decline and eventually disappear, adding booster exercise sessions to the intervention is suggested to induce long-term effects[3,6]. However, more data on the effects of such booster sessions and exercise therapy for the treatment of patients with hip OA in general are required.

The rapid increase in persons aged ≥55 years in Western countries implies that hip OA is becoming a public healthcare problem with increasing healthcare costs[1,7]. Economic evaluations are a prerequisite for the reimbursement and implementation of treatments in many countries, because they can provide healthcare decision makers with valuable information on the relative efficiency of alternative treatments[8,9].

Four earlier studies have assessed the cost-effectiveness (CE) of exercise therapy in patients with hip or knee OA. Reported costs per quality-adjusted life year (QALY) varied between about −$500 and $20.000[5,10–12]. Because of the lack of information on the costs as well as on the effectiveness of exercise therapy added to GP care (compared to GP care alone), GPs lack the knowledge to apply the most cost effective treatment to patients with hip OA. Therefore, the aim of the present study was to determine the CE of exercise therapy added to GP care (intervention group) compared to GP care only (control group) in patients with hip OA.

Method

This cost-utility study was performed in conjunction with a randomised controlled trial. More details of the study design can be read in the protocol[13]. In short, patients were identified via patient registries of the participating GPs. Patients of ≥45 years with hip OA who have consulted their GP during the past year regarding a new episode of non-traumatic hip complaints and who complied with the clinical American College of Rheumatology criteria for hip OA[14] were eligible for enrolment. Patients were excluded when they had received exercise therapy in the past 3 months, a hip pain score <2 on an 11-point numeric rating scale (0 means no pain), a hip surgery in the past or were on the waiting list for hip surgery, severe disabling co-morbidity that disallowed receiving exercise therapy, insufficient comprehension of the Dutch language and/or were mentally incapable of participation. Written informed consent was obtained from all patients and the study was approved by the Erasmus MC Medical Ethical committee.

Using a computer-generated list, patients were randomised to exercise therapy added to GP care (intervention group) or to GP care only (control group) by an independent researcher who was blinded to the GP assigning patients. Patients in the intervention group were appointed to standardised exercise therapy. The exercise therapy, supervised by physiotherapists, consisted of (maximally) 12 evenly spread treatment sessions during the first 3 months followed by 3 booster sessions at 5, 7 and 9 months follow-up. In both groups, patients received unrestricted visits to their GP similar to a normal care situation: the GP provided education and counselling, prescribed pain medication if applicable, referred the patient to an orthopaedic surgeon and/or requested additional diagnostic examinations. As this study uses the intention to treat principle, a minority of patients received a hip surgery during follow-up. Enrolment commenced in September 2009 and finished in October 2011. The follow up period was 1 year.

The primary outcome measures of the randomised clinical trial included hip pain and hip-related activity limitations[15]. Details of these clinical results will be reported in a forthcoming publication. The present paper will focus on the cost-utility study.

The cost-utility study was primarily conducted from a societal perspective, but the healthcare perspective was also applied. Data on direct medical costs, productivity costs and quality of life (QoL) was collected using standardised questionnaires which were sent to the home addresses of the patients at baseline and at 6, 13, 26, 39 and 52 weeks follow-up. The recall period was either 6 weeks (at 6 and 13 weeks) or 13 weeks (at baseline, 26, 39 and 52 weeks). Annual costs were determined by adding up the costs per period. The costs for the time between the measurement periods (week 6–7) were established through linear interpolation. The naïve imputation strategy was used for missing values. All costs were based on Euro 2011 cost data. Where necessary, costs were adjusted to 2011 using the general price index from the Dutch Central Bureau of Statistics.

Direct medical costs

Total direct medical costs for individual patients were determined by multiplying resource use by corresponding unit prices. Data on resource use of visits to healthcare providers (GP, physiotherapist, medical specialist, company physician, psychotherapist and rehabilitation specialist), inpatient hospital days, rehabilitation center, nursing home and residential home, medical imaging (X-rays and magnetic resonance imaging), laboratory services, medications, appliances (cold and hot compresses, orthopaedic insoles and wheelchairs) and home care was acquired from the questionnaires. Additionally, patients could specify visits to 'other professionals', e.g., acupuncturist, masseur, aquatherapist. Data on hip surgeries were taken from the clinical study records. With respect to the intervention group, resource use of visits to the physiotherapist was additionally obtained from the physiotherapist.

Resource use of visits to healthcare providers, inpatient days, laboratory services and home care was valued using reference unit prices[16]. The unit costs for hip surgery were based on a detailed microcosting study reflecting full hospital costs[17]. The resource use of medical imaging services was valued using fees as issued by the Dutch Healthcare Authority. Wholesale prices were used to value the resource use of medications and appliances. Cold and hot compresses were assumed to be used once monthly. Other appliances were assigned a life expectancy of 7 years.

Productivity costs

The productivity costs involved productivity losses resulting from absence from paid work and reduced efficiency at paid and unpaid work. The number of absent days from paid work due to hip OA was valued using reference hour prices of productivity costs per paid employee, corrected for elasticity of labour time to avoid that differences in productivity losses between the intervention and control group would be caused by (income) differences related to chance[16].

Reduced efficiency at paid work was also valued using the reference hour prices. The efficiency loss was established by means of the quality- and quantity method as developed by Brouwer *et al.* (1999) and incorporated in the PRODISQ instrument[18,19]. Patients gave their mark for the quality of their work on the last working day on a visual analog scale from 0 (worst quality) to 10 (best quality). The same question was posed for the quantity of their work on their last working day. These marks were assumed to be representative for the overall recall period. The efficiency loss during paid work in terms of hours lost was determined at $(1-(\text{quality}/10) \times (\text{quantity}/10)) \times$ working hours per day.

Regarding unpaid work, patients were asked to indicate how many hours of housekeeping tasks were taken over by their family, other people and paid aid due to hip OA. These hours were valued using the current price of simple professional home care[16].

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