

Preoperative Home-Based Physical Therapy Versus Usual Care to Improve Functional Health of Frail Older Adults Scheduled for Elective Total Hip Arthroplasty: A Pilot Randomized Controlled Trial

Ellen Oosting, MSc, Marielle P. Jans, PhD, Jaap J. Dronkers, MSc, Roelfrieke H. Naber, PMT, Christa M. Dronkers-Landman, PMT, Suzan M. Appelman-de Vries, Nico L. van Meeteren, PhD

ABSTRACT. Oosting E, Jans MP, Dronkers JJ, Naber RH, Dronkers-Landman CM, Appelman-de Vries SM, van Meeteren NL. Preoperative home-based physical therapy versus usual care to improve functional health of frail older adults scheduled for elective total hip arthroplasty: a pilot randomized controlled trial. *Arch Phys Med Rehabil* 2012;93:610-6.

Objective: To investigate the feasibility and preliminary effectiveness of a home-based intensive exercise program to improve physical health of frail elderly patients scheduled for elective total hip arthroplasty (THA).

Design: Single-blind pilot randomized controlled trial.

Setting: Patients' homes and a general hospital in The Netherlands.

Participants: Frail patients (N=30) older than 65 years.

Intervention: A preoperative, home-based program supervised by an experienced physical therapist to train functional activities and walking capacity. The control group received usual care consisting of 1 session of instructions.

Main Outcome Measures: Feasibility was determined on the basis of adherence to treatment, patient satisfaction, adverse events, walking distance (measured with a pedometer), and intensity of exercise (evaluated with the Borg scale). Preliminary pre- and postoperative effectiveness was determined by the Timed Up & Go (TUG) test, 6-minute walk test (6MWT), Chair Rise Time, and self-reported measures of functions, activities, and participation.

Results: Patient satisfaction and adherence to the training were good (median=5 on a 5-point Likert scale) and no serious adverse events occurred. The Borg score during training was 14 (range, 13–16). Preoperative clinical relevant differences on the TUG test (2.9s; 95% confidence interval [CI], –0.9 to 6.6) and significant differences on the 6MWT (41m; 95% CI, 8 to 74) were found between groups.

Conclusions: Intensive preoperative training at home is feasible for frail elderly patients waiting for THA and produces

relevant changes in functional health. A larger multicenter randomized controlled trial is in progress to investigate the (cost-)effectiveness of preoperative training.

Key Words: Arthroplasty; replacement; hip; Feasibility studies; Frail elderly; Osteoarthritis; Rehabilitation.

© 2012 by the American Congress of Rehabilitation Medicine

TOTAL HIP ARTHROPLASTY (THA) reduces pain and improves function and health-related quality of life in patients with end-stage osteoarthritis (OA).¹ Given the aging population, the number of THAs is expected to increase substantially to about 50,000 procedures in The Netherlands by 2030.^{2,3} However, not all patients benefit to the same extent from THA,¹ and the preoperative functional status appears to be an important predictor of the postoperative course and outcome.⁴⁻⁸ Patients with end-stage OA have a wide spectrum of limitations that are summarized in an *International Classification of Functioning, Disability and Health* core set for OA.^{9,10} Clinical evidence indicates that rehabilitation is faster in patients who are in better physical condition before surgery than their less fit counterparts.^{4,11,12}

The effects of preoperative physical training on functional status and postoperative recovery after THA have been studied before,¹³⁻²⁰ but results are inconsistent, possibly due to methodologic limitations,^{13,15} the lack of overload induced during training,^{13,16} and the inclusion of relatively healthy patients.^{15,16,19} According to the Dutch guidelines and other studies, exercise for patients with OA should focus on stimulating functions, activities, and participation and on promoting adequate coping strategies and it should be targeted to those who are particularly disabled.²¹⁻²³

An earlier pilot study involving frail elderly patients scheduled for THA yielded encouraging results with respect to

List of Abbreviations

CRT	Chair Rise Time
HOOS	Hip disability and Osteoarthritis Outcome Score
ILAS	Iowa Level of Assistance Scale
ISAR	Identification of Seniors At Risk
LAPAQ	Longitudinal Aging Study Amsterdam Physical Activity Questionnaire
LOS	length of stay
OA	osteoarthritis
PSC	Patient Specific Complaints
RCT	randomized controlled trial
6MWT	six-minute walk test
THA	total hip arthroplasty
TUG	Timed Up & Go

From Department of Physiotherapy, Gelderse Vallei Hospital, Ede (Oosting, Dronkers, Naber, Dronkers-Landman, Appelman-de Vries); School of Physiotherapy, University of Applied Sciences, Utrecht (Jans); and The Netherlands Organisation for Applied Scientific Research TNO, Leiden, and Center for Care Technology Research, Maastricht (van Meeteren), The Netherlands.

Supported by the Scientific College Physical Therapy of the Royal Dutch Society for Physical Therapy.

No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated.

Reprint requests to Ellen Oosting, MSc, Gelderse Vallei Hospital, Department of Physiotherapy Willy Brandtlaan 10, 6716 RP Ede, The Netherlands, e-mail: oosting@zgv.nl.

In-press corrected proof published online on Feb 27, 2012, at www.archives-pmr.org.

0003-9993/12/9304-0042\$36.00/0

doi:10.1016/j.apmr.2011.11.006

preoperative functional outcomes but also revealed that more than 60% of the participants, especially the most frail patients, had problems participating because of the distance they had to travel to the outpatient department where the training was given and because they did not have enough energy to perform the exercises.²⁴ As evident from the literature, existing guidelines, and our earlier pilot study, preoperative exercise should focus on frail elderly patients and should be functional, targeting their limitations in activities and participation and taking into account environmental and personal factors. This prompted the development of a home training scheme to facilitate the participation of frail elderly individuals, with the added benefit that home-based training may be more ecologically valid.²⁵⁻²⁸

Before planning a future randomized controlled trial (RCT), we performed the current pilot study to test the feasibility and to help clarify decisions about outcome measures and procedures.²⁵ The main aim of this pilot study was to investigate the feasibility of a home-based, short-term intensive therapeutic exercise program for frail elderly patients scheduled for elective THA. A second aim was to investigate the preliminary effectiveness of this program on pre- and postoperative functional health.

METHODS

The study design was a single-blind pilot RCT.

Participants

Patients were recruited from the orthopedic department of the Gelderse Vallei Hospital in Ede, a general hospital in The Netherlands. Inclusion criteria were (1) elective THA (minimum waiting period of 3wk), (2) OA as underlying diagnosis for THA, (3) age older than 65 years, and (4) a score of 2 or higher on the frailty index Identification of Seniors At Risk (ISAR).²⁹

Because clinical prediction rules to assess which patients might have delayed functional recovery after total hip replacement were not available at the time of the study, the ISAR score was used to select patients.²⁹

Exclusion criteria were (1) unable to understand Dutch, (2) inadequate cognitive functioning (ie, not able to understand instructions), (3) revision of THA, and (4) diagnosed with dementia or severe heart disease.³⁰

The protocol was approved by the Medical Ethics Committees of the University Medical Centre Utrecht and the Gelderse Vallei Hospital, Ede.

After patients were informed about the study and checked for inclusion criteria by a clinical nurse specialist, they were sent to the physical therapy outpatient department. Here inclusion and exclusion criteria were checked again, and patients were asked to sign informed consent. After baseline measurements were taken (t0), participants were randomly assigned to the intervention or control group by a research assistant not associated with the study. Randomization took place after stratification by age (65–70y and age>70y), using prepared envelopes per stratum. Within each stratum a permuted block randomization with a block size of 10 was used. The 2 physical therapists (R.H.N. and C.M.D.) who performed the training and the patients were not blinded to treatment allocation, whereas outcome assessors (E.O. and S.M.A.) were.

Intervention Group

During supervised sessions (30min/session), patients trained functional activities and walking capacity³⁰ twice a week for 3 to 6 weeks. Training was tailored to both the patient and his/her home environment, essentially according to the principles of

functional task exercise developed by de Vreede et al.^{31,32} The intensity and number of repetitions of the exercises were progressively increased over time, and functional activities were made more challenging by combining physical tasks or asking patients to perform physical and mental tasks. The patients were instructed to additionally train 4 times/wk on their own or with the help of friends or relatives. They received a home-based exercise program with patient-tailored functional activities and walking. They were given a pedometer with a 7-day memory^a to monitor their walking activity, with an aim that they walk a minimum of 30 min/d in a graded activity manner.³³ Patients kept a diary of their daily exercise and possible adverse events and symptoms. If patients reported experiencing symptoms or pain after training, physical therapy and relaxation exercises were given as recommended in the Dutch guideline for OA,²³ to decrease patient discomfort.

The subjects trained at a moderate intensity of exercise, corresponding to 55% to 75% of their maximal heart rate or to perceived exertion between 11 and 13 on the Borg scale.³⁰ Because the training was personalized, functional capacity was monitored with a standardized tailor-made functional circuit, where patients had to perform functional activities like walking, climbing stairs, and sit and rise from a chair. We measured the time needed to finish the circuit and/or perceived exertion.

Control Group

Patients in the control group received care as usual in the Gelderse Vallei Hospital, which consisted of a single group session supervised by a physical therapist 3 weeks before surgery. In this session they received information about the operation, walking with crutches, and exercises that would be performed in the postoperative phase. These components were also part of the individual training in the intervention group.

Measurements

Measurements were taken at baseline (t0), 2 to 4 days before admission (t1), at discharge (t2), and 6 weeks after discharge (t3). At the time of the baseline measurements, demographic data (table 1) were verified and the physical therapists rated the frailty of patients.

Table 1: Characteristics of Patients in the Intervention and Control Groups at Baseline

Characteristics	Intervention (n=15)	Control (n=15)	P
Age (y)	76.9±6.3	75.0±6.3	.41
Sex (n/% women)	14/93	10/67	.17
Living situation			
Living alone (n/%)	8/53	5/33	.26
Living with partner or relative (n/%)	7/40	10/67	
Living in institution (n/%)	1/7	0/0	
Expected discharge to home (n/%)	9/60	10/67	.71
Body mass index (kg/m ²)	28.6±5.6	27.8±4.2	.68
Preoperative waiting period (d)	34.2±5.8	36.2±12.6	.58
Surgery technique			
Anterior minimal invasive (n/%)	5/33	5/33	1.00
Posterolateral (n/%)	10/67	10/67	
Bilateral symptoms (n/%)	4/27	4/27	1.00
First THA (n/%)	12/80	12/80	1.00
Use of walking assistance (n/%)	9/60	8/53	.71
6MWT (m)	272±74	297±99	.44
TUG test (s)	15.2±7.0	14.3±12.9	.81
CRT test (s)	47.5±26.9	32.7±10.0	.07

NOTE. Data are mean ± SD or as otherwise indicated.

Download English Version:

<https://daneshyari.com/en/article/3449407>

Download Persian Version:

<https://daneshyari.com/article/3449407>

[Daneshyari.com](https://daneshyari.com)