



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: <http://ees.elsevier.com/jot>



ORIGINAL ARTICLE

Are patients with knee osteoarthritis and patients with knee joint replacement as physically active as healthy persons?

Rikke Daugaard ^{a,*}, Marianne Tjur ^a, Maik Sliepen ^b,
Matthijs Lipperts ^e, Bernd Grimm ^{c,☆}, Inger Mechlenburg ^{a,d,☆}

^a Orthopaedic Research Unit, Aarhus University Hospital, Aarhus, Denmark

^b Institut für Experimentelle Muskuloskelettale Medizin, Universitätsklinikum Münster, Münster, Germany

^c AHORSE Research Foundation, Department of Orthopaedic Surgery, Zuyderland Medical Center, Heerlen, The Netherlands

^d Centre of Research in Rehabilitation (CORIR), Department of Clinical Medicine, Aarhus University Hospital and Aarhus University, Aarhus, Denmark

^e Department of Medical Information and Communication and Technology, St. Anna Hospital, Geldrop, The Netherlands

Received 22 November 2017; received in revised form 9 February 2018; accepted 2 March 2018
Available online 3 April 2018

KEYWORDS

Accelerometry;
Activity monitoring;
Knee osteoarthritis;
Knee replacement;
Physical activity

Abstract *Background:* It is well documented that patients with knee osteoarthritis (KOA) suffer from reduced physical function and that function of the affected knee is improved after knee joint replacement (KJR). However, it remains uncertain whether patients with KOA are less physically active than healthy people and whether patients increase their level of physical activity after surgery to a level comparable with that of healthy people. The aim of this study was to examine whether patients with KOA are less physically active than healthy participants and whether patients who have undergone KJR show an increased activity and achieve the same level of physical activity as healthy participants 5 years postoperatively.

Methods: Fifty-four patients with KOA (29 women; mean age 62 ± 8.6; mean body mass index (BMI) 27 ± 5), 52 patients who had KJR due to KOA 5 years earlier (26 women; mean age 66 ± 7.2; mean BMI 30 ± 5) and 171 healthy participants (76 women, mean age 64 ± 9.7, mean BMI 26 ± 5) were included in this cross-sectional study. The level of physical activity was measured over a mean period of 5.5 days with a triaxial accelerometer mounted on the thigh. Number of daily steps, number of daily short walking bouts of <10 s duration and number of daily transfers from sitting to standing position were recorded. Data were analysed using two sample *t* tests and were adjusted for age, gender and BMI.

* Corresponding author. Orthopaedic Research Unit, Aarhus University Hospital, Tage-Hansens Gade 2, DK-8000 Aarhus C, Denmark.

E-mail address: maildaugaard@gmail.com (R. Daugaard).

☆ These authors contribute equally to this work.

Results: Patients with KOA did not differ significantly from healthy participants regarding daily steps (+321, $p = 0.50$) or daily transfers from sitting to standing (+1.9, $p = 0.52$) but performed significantly less daily short walking bouts <10 s (-11.9, $p = 0.02$). Patients after KJR did not differ significantly from healthy participants regarding daily steps (-281, $p = 0.60$) or transfers from sitting to standing position (-3.2, $p = 0.32$) but performed significantly less daily short walking bouts <10 s (-21.7, $p = 0.001$).

Conclusion: Patients with KOA and KJR showed no significant reduction in number of daily step counts and transfers from sitting to standing position when compared with matched healthy controls. However, the number of short walking bouts was reduced in patients with KOA and by twice as much in patients with KJR. This indicates that KOA and treatment with KJR hardly affect health-related general activity but do affect specific physical activity behaviour potentially indicative of KOA or post-KJR functional limitations.

The translational potential of this article: Activity monitoring with an accelerometer-based method gives insights into health-related general activity levels such as total daily steps and specific parameters such as short walking bouts, which may serve as an objective outcome measure in clinical practice.

© 2018 The Authors. Published by Elsevier (Singapore) Pte Ltd on behalf of Chinese Speaking Orthopaedic Society. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Knee osteoarthritis (KOA) results in pain, stiffness and limitation of movement [1]. High age and overweight are among the most predominant factors in developing KOA [2]. Knee joint replacement (KJR) may be required in end-stage KOA and is known to reduce pain, increase functional ability [2–4] and improve patients' quality of life [2,4–6].

Increased physical activity (PA) is a desired outcome after KJR surgery, and in the early recovery phase, PA seems to be associated with reduced length of hospitalisation [7]. PA is also an important component in the preventive treatment and rehabilitation of patients with KOA. Physical exercise has been shown to relieve pain and stiffness of the knee joint and improve the objectively assessed function [8] and can therefore postpone KJR surgery. Furthermore, PA is well known to decrease the risk of a broad range of lifestyle diseases [9]. Unfortunately, physical inactivity is highly prevalent among patients with KOA [9,10] contributing to forming a vicious circle; inactivity is a risk factor for KOA, and KOA itself causes more inactivity, which aggravates the symptoms further.

It is well documented that patients with KOA have reduced physical function and that function of the affected knee is improved after KJR. These patients will thus have the potential to lead a more active lifestyle [2,4]. However, it is uncertain whether patients with KOA are actually less physically active than healthy people, and if so, to which extent, and whether patients increase their level of PA after surgery to a level comparable with that of healthy people [5,6,9,10]. If not, this could be due to adapting to an inactive lifestyle or fear of overloading the operated knee [11].

The literature shows disagreement on whether patients are more physically active during the years after KJR surgery. A selection of studies measuring PA using objective measures suggests that patients only achieve minor increases in their level of PA [5,6,9,10]. In a systematic review, Paxton et al compared the results of 18 studies regarding this issue and found inconclusive results on

whether patients increased or decreased their level of PA [9]. The studies showing an increase in the level of PA were primarily based on self-reported data. Self-reported data can be biased as they are affected by pain experience and expectation to own abilities and are thus less suitable for outcome assessment [3]. This is especially true for self-reported data on PA where a review of the most popular instruments showed that none of the reviewed studies used adequate measurement properties; accelerometry was thus recommended for valid assessment [12].

Activity monitoring by an accelerometer-based method is an objective method and is applicable to monitor patients' levels of PA and daily and weekly patterns of PA behaviour [13]. In addition, the method provides a number of parameters tracking the patients' progression in physical performance and daily use of physical capacity, such as number of transfers from sitting to standing and number of walking bouts, which are otherwise solely examined at clinical controls by physical performance tests. This may provide disease- or treatment-specific aspects of outcome and thus serves as a remote monitor of patient function in a translational application.

The aim of this study was to examine whether patients with KOA are less physically active than healthy participants, using selected variables from an accelerometer-based method and then to examine whether patients who have undergone KJR achieve the same level of physical activity as healthy participants 5 years postoperatively.

Materials and methods

This cross-sectional study included data from three different data collections, among patients in Germany, the Netherlands and healthy participants in Denmark (Figure 1).

Data on the patients with KOA were collected as part of a German study from Münster University Hospital between February 2016 and February 2017. The patients were recruited through newspaper advertisements and referrals from their doctor or orthopaedic surgeon. The patients

Download English Version:

<https://daneshyari.com/en/article/8608129>

Download Persian Version:

<https://daneshyari.com/article/8608129>

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