

The clinical utility of patient-reported outcome measures in total hip replacement and lumbar spine surgery

AKADEMISK AVHANDLING

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av

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Avhandlingen baseras på följande delarbeten

- I. Eneqvist T, Nemes S, Brisby H, Garellick G, Fritzell P, Rolfson O. Low back surgery prior to total hip replacement is associated with worse patient-reported outcomes. *Bone Joint J.* 2017 Jun;99-B(6):759-765.
- II. Eneqvist T, Bülow E, Nemes S, Brisby H, Garellick G, Fritzell P, Rolfson O. Patients with a previous total hip replacement experience less reduction of back pain following lumbar back surgery. *J Orthop Res.* 2018 Apr 12. [Epub ahead of print]
- III. Eneqvist T, Nemes S, Brisby H, Garellick G, Fritzell P, Rolfson O. Does the order of total hip replacement and lumbar spine surgery influence patient-reported outcomes? In Manuscript
- IV. Eneqvist T, Nemes S, Bülow E, Mohaddes M, Rolfson O. Can patient-reported outcomes predict reoperations after total hip replacement? *Int Orthop.* 2018 Feb;42(2):273-279.
- V. Eneqvist T, Nemes S, Kärrholm J, Burström K, Rolfson O. How do EQ-5D-3L and EQ-5D-5L valuations compare in a Swedish total hip replacement population? In Manuscript

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



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Abstract

Background: Beginning in the late 1990s, the Swedish Hip Arthroplasty Register (SHAR) and the Swespine have successfully implemented programs to collect patient-reported outcomes measures (PROMs). The use of PROMs has enabled assessment of patients' health-related quality of life (HRQoL), physical function and pain following total hip replacement (THR) and lumbar spine surgery (LSS). The nationwide collection of PROMs has made it possible to evaluate changes of care, compare providers, investigate factors influencing outcomes that matter for patients, and it has contributed to improvement in clinical practice.

Objective: The overall objective of this thesis is to investigate different ways to utilize PROMs following total hip replacement and lumbar spine surgery. Specifically, this thesis aims to:

- Investigate PROMs in patients who have undergone LSS prior to THR and in patients who have undergone THR prior to LSS compared to matched patients with isolated THR or LSS.
- Investigate if the order of THR and LSS affects PROMs one year following the last procedure in patients with both procedures performed within a period of two years.
- Investigate if PROMs can predict the risk for reoperation following THR.
- Assess the measurement properties of EQ-5D-5L compared to EQ-5D-3L in a Swedish THR population and to estimate how different severity levels of the two versions of the questionnaire conforms.

Patients and methods: For Paper I-III, data including PROMs on patients with THR and LSS performed in 2002-2012 were obtained from SHAR and Swespine and linked to identify those who occurred in both registers. In Paper IV, data from SHAR on patients with THR in 2002-2014 were used to establish the relationship between PROMs and reoperation. For Paper V, patients eligible for THR in western Sweden during 2015 were invited to answer EQ-5D-3L and EQ-5D-5L with a two-week separation before and after surgery. Logistic and linear regression analyses were used to investigate research questions.

Results: Patients with both THR and LSS performed had worse one-year PROMs following the last procedure compared to patients with surgery in only one location. Patients eligible for both THR and LSS within a short period of time had better outcomes following the last procedure if surgery started with LSS. PROMs collected one year following THR predicted the risk for subsequent reoperation. Patients frequently utilized the additional response options of EQ-5D-5L and ceiling effects at the one-year follow-up were reduced compared to EQ-5D-3L. EQ VAS estimates for different severity levels conformed well between questionnaires.

Conclusion: This thesis contributes to the understanding of patient-reported outcomes for patients who undergo both THR and LSS. Given their ability to predict reoperations following THR, PROMs can be utilized to identify patients at increased risk, which may be used to improve follow-up routines and care. Since EQ-5D-5L better describes health-related quality of life in THR patients, the introduction of the extended questionnaire as a standard tool in SHAR will enable a more accurate assessment of the procedure.

Keywords: Total hip replacement, Lumbar spine surgery, Patient-reported outcome measures, Register, Revision