The 6-meter timed hop test is a prognostic factor for 2-year outcomes in patients with degenerative meniscal tears

A secondary analysis of the OMEX trial

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Background

RCTs have shown no superiority or difference after treatments with exercise therapy (ET) or arthroscopic partial meniscectomy (APM) with or without concomitant ET or sham surgery\textsuperscript{1-8}

The 6-meter timed hop test is a prognostic factor for 2-year outcomes in patients with degenerative meniscal tears

\textsuperscript{1}Herrlin et al. 2007, 2013, \textsuperscript{2}Østerås et al. 2012, \textsuperscript{3}Katz et al. 2013, \textsuperscript{4}Yim et al. 2013, \textsuperscript{5}Sihvonen et al. 2013, 2017, \textsuperscript{6}Gauffin et al. 2014, 2017, \textsuperscript{7}Kise et al. 2016, \textsuperscript{8}van der Graaf et al. 2018
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Background

RCTs concern mean changes in groups and take no care of differences on individual level

https://www.vappingo.com/word-blog/black-sheep-of-the-family/
Aim

To identify **prognostic factors**
for 2-year patient-reported outcomes
in middle-aged patients
with **degenerative meniscal tears**
treated with
exercise therapy (ET) or arthroscopic
partial meniscectomy (APM)

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**Materials**

- Odense-Oslo Meniscectomy versus Exercise (OMEX) trial ([www.clinicaltrials.gov](http://www.clinicaltrials.gov) NCT01002794)

  - 107 patients
  - 65 men (60.7%)
  - Mean age 49.6 years (SD 6.2)
  - Mean BMI 25.7 (SD 3.7)
Methods

• Potential prognostic factors
  – Knee function-related factors:
    • Muscle strength (quadriceps, peak torque 60 deg./sec.$^1$)
    • Lower extremity performance$^2$
      – One leg hop test for distance
      – One leg 6-meter timed hop test
      – Maximum knee bending in 30 sec. test
    • HUNT 1 activity index$^3$

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$^1$Sole et al 2007
$^3$Kurtze et al 2008
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Methods

• Potential prognostic factors
  – Disease-related factors:
    • Meniscal degeneration grade\textsuperscript{1}
      – Intrameniscal global signal/linear/penetrating one or both meniscal surfaces
    • Meniscal extrusion grade\textsuperscript{2}
      – \(a/b \times 100 = \text{extrusion in percent}\)

\textsuperscript{1}Crues et al. 1987
\textsuperscript{2}Ha et al 2014
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Methods

• 2-year patient-reported outcomes:
  – KOOS\(^1\) subscales Pain, Symptoms, ADL, Sport/Rec, QoL
    \(^1\)KOOS=Knee injury and Osteoarthritis Outcome Score
  – 5-point Global Rating of Change scales
    • GRC Pain
    • GRC Function
      – The GRC scales were \textit{dichotomized} with the cut-off between “unchanged” and “better”

«How is your knee pain/function compared to baseline? Much better/better/unchanged/worse/much worse?»

\(^1\)Roos et al 1998, 1999, 2003
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**Statistics**

- Multiple linear regression models
  - KOOS subscales
- Poisson regression models
  - GRC Pain / Function

- Analyses for the whole cohort (n=107) and for the two treatment groups (n=55 and 52) *with adjustments for age, gender, BMI and baseline KOOS*

- Totally 21 analyses
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Results

• A one-second better 6-meter timed hop test was prognostic for
  – 3.1-7.1 better KOOS scores for the whole cohort
  – 2.6-5.5 better KOOS Symptoms, Sport/Rec and QoL for the ET-group
  – 7.6-11.0 better KOOS Pain, ADL, Sport/Rec and QoL for the APM-group
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Results

• A one-second better 6-meter timed hop test was prognostic for
  – 26% higher possibility for scoring better/much better GRC Pain for the whole cohort, 17% and 65% higher possibility for ET- and APM-group
  – 22% higher possibility for scoring better/much better GRC Function for the whole cohort, 70% higher for APM-group

• Higher HUNT 1 activity index:
  – 64% and 83% higher possibility for scoring better/much better GRC Pain and Function for the APM-group
Conclusions

- The **6-meter timed hop test** result was a significant **prognostic factor** for two-year patient-reported outcomes in middle-aged patients with degenerative meniscal tears.

- The associations between test results and outcomes were strongest in patients treated with **APM**.

- This test is easily implemented in clinical practice and useful to identify patients at risk of worse two-year outcome.
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