Physical function measurements predict mortality in ambulatory older men

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Introduction

- Physical function measurements
  → health-related outcomes

- Functional status measurements
  ↔ objective measurements

- Assessment & comparison of physical function measurements as predictors for all-cause mortality

1 Studenski S et al. 2003
2 Guralnik JM et al. 1989
1,2 Cooper R et al. 2010
Introduction

- **Timed Up and Go test** ¹
  - falls ²
  - mortality ³

- **Evaluation Timed Up and Go test as a predictor for global mortality**
  - after 15y follow-up
  - in subjects with underlying comorbidity

¹ Podsiadlo D et al. 1991
² Shumway-Cook A et al. 2000
³ Viccaro LJ et al. 2011
³ Tice JA et al. 2006
³ Hoshide S et al. 2008
³ Davis DH et al. 2011
Design

- Observational study (1996 - 2011)
- Community-based setting (Merelbeke)
- Participants:
  - 352 ambulatory older men ( / 748)
  - aged 70 to 85 at recruitment
Physical function measurements

- ADL Rapid disability rating scale-2
- Physical function index <
  36-Item short form health survey
- Hand grip strength
- Five times sit-to-stand test
- Standing balance
- Timed Up and Go test

Functional status measurements

Muscle strength measurement

Physical performance measurements
Methods

➤ Follow-up > 15y

➤ Cox proportional hazard analyses (Z-scores)

➤ Covariates: age, BMI, smoking status, education, physical activity, and cognitive status

➤ Comorbidity status:
  ➤ cardiovascular disease
  ➤ chronic obstructive pulmonary disease
  ➤ diabetes mellitus
Results

- 71 - 86y at baseline
- Mean score RDRS-2 = 22
- † 273 / 352 men (78%)
- Median survival time = 110 months
Results

Rapid Disability Rating Scale-2 ADL

Short Form-36 Physical Function Index

\[ P < 0.001 \]

Survival Probability

Time (Month)

Survival Probability

Time (Month)
Results

Standing Balance

Grip Strength

\[ P = 0.006 \]

\[ P < 0.001 \]
Results

5 Times Sit-to-Stand

Timed Up and Go

\[ P < 0.001 \]

- \(< 11.7 \text{ s} \)
- \(11.7-14.6 \text{ s} \)
- \(>14.6 \text{ s} \)

\[ P < 0.001 \]

- \(< 10.0 \text{ s} \)
- \(10.0-12.5 \text{ s} \)
- \(>12.5 \text{ s} \)
Results

Global

Median Survival Time (Months)

$P < 0.001$

<= 12

> 12

Timed Up and Go (Seconds)

Subjects with Cardiovascular Disease

Median Survival Time (Months)

$P = 0.003$

<= 12

> 12

Timed Up and Go (Seconds)
Results

For subjects with COPD, the median survival time (in months) was compared between those who took 12 seconds or less to complete the Timed Up and Go test and those who took more than 12 seconds. The test statistic was $P = 0.202$.

For subjects with diabetes, the median survival time (in months) was compared between those who took 12 seconds or less to complete the Timed Up and Go test and those who took more than 12 seconds. The test statistic was $P = 0.285$. 
Discussion

- Weaker association with mortality
  \[ \xrightarrow{\text{Longer follow-up}} \]

- *Timed* physical performance measures
  \[ \xleftrightarrow{\text{functional status measurements}} \]

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1 Cesari M *et al.* 2008
2,3 Cooper R *et al.* 2010
Conclusion

- **Assessment of physical functioning in the evaluation of older persons!**

- **Timed Up and Go test**
  - Objective time score
  - Quick (mean = 12.2 sec)
  - No special training
  - Feasible (348 / 352)
  - Little equipment needed