Test characteristics of Medication Adherence Report Scale (MARS-5) as a quantitative measure of adherence to inhalation medication in patients with COPD

Eline Tommelein¹, Els Mehuys¹, Inge Van Tongelen¹, Guy Brusselle², Jean-Paul Remon¹, Koen Boussery¹

¹ Pharmaceutical Care Unit, Faculty of Pharmaceutical Sciences, Ghent University, Harelbekestraat 72, B-9000 Ghent, Belgium.

² Department of Respiratory Diseases, Ghent University Hospital, De Pintelaan 185, B-9000 Ghent, Belgium.
Introduction

Chronic Obstructive Pulmonary Disease

- Lung disease: persistent airflow limitation
- Not fully reversible
- Progressive

Pharmacological treatment

- Bronchodilators
- Steroids

= maintenance therapy
= mainly via inhalation
Introduction

Nonadherence to inhalation therapy
– Generally considered frequent
– Associated with
  • More frequent exacerbations
    → Higher morbidity
    → Increased social burden for patients
    → Increased economic burden for health care systems
  • Higher mortality
Introduction

Accurate adherence measure

– Necessary
– No ‘gold standard’ has been defined
– Self-report
  • Recommended most suitable for clinical practice
  • Easy to use, inexpensive, not time-consuming
  • Subjective, tends to overestimation
  • No validation in COPD population yet
Introduction

Reference standard: Refill adherence

- Shown to be reliable
- Non-invasive, objective, inexpensive
- Easy for large populations
- Estimation
Objective

• Nonadherence prevalence in patients with COPD

• Evaluation of accuracy of self-report with refill adherence as reference
Methods

Self report: MARS-5 (*Medication Adherence Report Scale*)
- 5 items addressing nonadherent behavior
- 5-point Likert scale
- Range: 5-25

Refill adherence: MRA (*Medication Refill Adherence*)

\[
\frac{\text{Number of doses supplied by pharmacy}}{\text{Number of doses prescribed by GP}}
\]
Methods

Correlation
   – Spearman’s rank ($\rho$)

Sensitivity and PPV calculation
   – Dichotomized MARS-5 (different thresholds)
   – Reference: Dichotomized MRA ($\geq 80\%$)

ROC-curve plotting
Results

MARS-5

- Mean (SD) 23.5 (2.6)
- N° of patients scoring 25 369/613 (60.2%)
- Internal consistency Cronbach α = 0.77

MRA

- Mean (SD) 83.4% (23.8%)
- N° of patients scoring ≥ 80% 386/613 (63.0%)
Results

- Poor correlation ($\rho=0.103; \ P=.011$)
- Poor sensitivity & PPV
Results

• ROC-curve

\[ AUC = 0.56 \]
\[ 95\% CI = [0.52-0.62] \]
\[ P = .005 \]
Discussion

Reasons for low agreement

– Conceptually different scores
– Unintentional NA may be underestimated in self-report
– Self-report sensitive to socially desirable answers
– Different time-frames

Limitations

– Refill adherence = estimate
– In COPD the 80% cut-off lacks clinical evidence
Conclusion

• Accuracy of MARS-5 against refill adherence was evaluated

• MARS-5 not useful for quantitative determination of adherence in COPD patients

• Validation of self-report scales necessary
Questions?

Thank you