

Uncovering the Relationship Between the COPD Assessment Test and St George's Respiratory Questionnaire in Patients with Chronic Obstructive Pulmonary Disease: a Post-hoc Analysis of the IMPACT, FULFIL, and EMAX trials

P. W. Jones¹, S. Shukla², L. Tombs³, A. S. Ismaila^{2,4}, A. Martin⁵, D. Midwinter¹, I. H. Boucot¹, N. Risebrough⁶, C. Vogelmeier⁷

¹GlaxoSmithKline, Brentford, United Kingdom, ²GlaxoSmithKline, Collegeville, PA, United States, ³Precise Approach Limited, London, United Kingdom, ⁴Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada, ⁵GlaxoSmithKline, Uxbridge, United Kingdom, ⁶Icon Plc, Toronto, ON, Canada, ⁷Philipps Universität Marburg, Marburg, Germany

Background

- The COPD assessment test (CAT) and St George's Respiratory Questionnaire (SGRQ) are two validated tools used to measure health status in COPD.
- When only one tool is available in a clinical study, it may be useful to have the ability to convert between CAT scores to SGRQ scores to enable further use, for example in economic modelling or comparative effectiveness research.
- We present results from an exploratory analysis conducted to identify if a method could be developed to convert CAT scores to SGRQ total scores.

Methods

- Individual patient-level data from three large multinational COPD trials (EMAX,¹ FULFIL,² and IMPACT³) were used to investigate the relationship between SGRQ and CAT scores.
- A regression equation based on cross-sectional comparisons between patients was developed for each study, and was used to convert baseline and Week 24 CAT scores from each study to SGRQ scores.

	EMAX	FULFIL	IMPACT
Study design	24 weeks Double blind Randomised Double dummy	24 weeks Double blind Randomised Double dummy	52 weeks Double blind Randomised
Patients	2,425	1,810	10,355
Treatment	1x daily: UMEC/VI (62.5/25 µg) 2x daily: Placebo 1x daily: UMEC (62.5 µg) 2x daily: Placebo 1x daily: Placebo 2x daily: Salmeterol (50 µg)	1x daily: FF/UMEC/VI (100/62.5/25 µg) 2x daily: Placebo 1x daily: Placebo 2x daily: BUD/FOR (400/12 µg)	1x daily: FF/UMEC/VI (100/62.5/25 µg) 1x daily: FF/VI (100/25 µg) 1x daily: UMEC/VI (62.5/25 µg)

BUD: budesonide; FF: fluticasone furoate; FOR: formoterol; UMEC: umeclidinium; VI: vilanterol

References:

- Maltais et al., *Respir Res* 2019;20:238;
- Lipson et al., *Am J Respir Crit Care Med* 2017;196:438–446;
- Lipson et al., *NEJM* 2018;378:1671–1680.

Disclosures

- This study was funded by GlaxoSmithKline (GSK study 212888). PJ, SS, AI, DM, IB are employees of and/or hold stocks/shares in GSK. AI is also an unpaid professor at McMaster University, Canada. LT is an employee of Precise Approach Limited, UK. NR is an employee of ICON. ICON received funding from GSK to conduct this study. CV gave presentations at symposia and/or served on advisory boards sponsored by AstraZeneca, Boehringer Ingelheim, CSL Behring, Chiesi, GSK, Grifols, Menarini, Novartis, Nuaira, and MedUpdate.
- On behalf of all authors, an audio recording of this poster was prepared by Paul Jones, who did not receive any payment for this recording.

Results

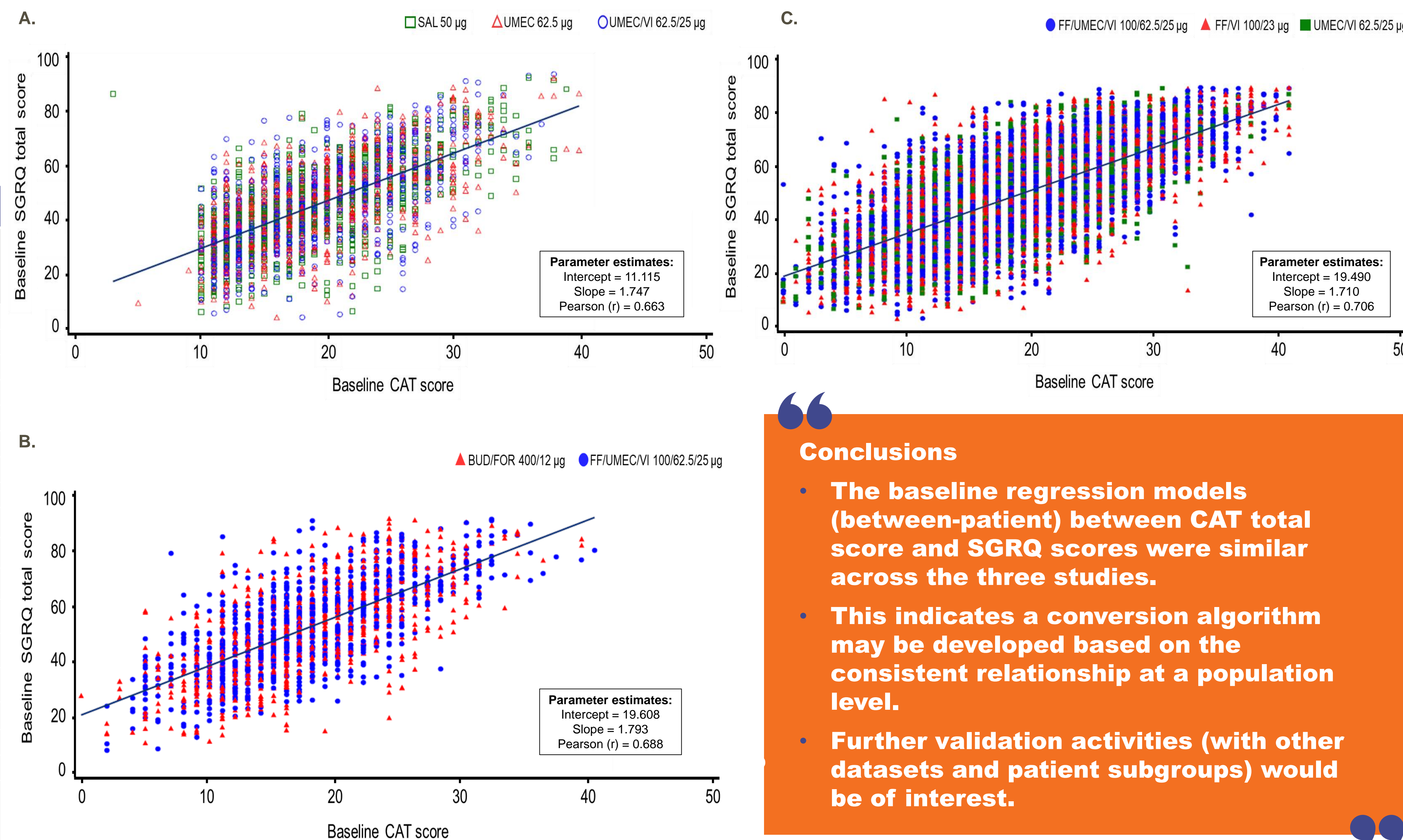
- The scatterplots of SGRQ total score vs CAT score at baseline for each of the three studies are shown in Figure 1. Pearson correlation coefficients ranged from 0.663 to 0.706.
- The regression slopes were similar for each of the trials; for each unit change in CAT score, SGRQ increased by 1.71 to 1.79.
- The intercept estimates for the FULFIL and the IMPACT trial (i.e. SGRQ score at CAT=0) were 19.6 and 19.5, respectively. The intercept for the EMAX trial was 11.1 (Figure 1A), possibly due to the exclusion of patients with CAT <10.
- Baseline overall and on-treatment conversions, stratified by treatment arm, are shown in Table 1.

Table 1. Regression analysis of SGRQ total score vs CAT score

	Intercept	Slope	Pearson correlation coefficient (r)	Spearman correlation coefficient (r)
EMAX				
Baseline	11.115	1.747	0.663	0.650
Week 24				
UMEC/VI	11.124	1.801	0.727	0.712
UMEC	8.982	1.936	0.766	0.750
SAL	12.180	1.765	0.736	0.717
FULFIL				
Baseline	19.608	1.793	0.688	0.681
Week 24				
FF/UMEC/VI	15.040	1.968	0.764	0.767
BUD/FOR	16.660	1.845	0.691	0.691
IMPACT				
Baseline	19.490	1.710	0.706	0.703
Week 24				
FF/UMEC/VI	14.587	1.863	0.752	0.746
FF/VI	15.486	1.844	0.742	0.737
UMEC/VI	14.511	1.882	0.761	0.754

BUD: budesonide; CAT: COPD assessment test; FF: fluticasone furoate; FOR: formoterol; SAL: salmeterol; SGRQ: St George's Respiratory Questionnaire; UMEC: umeclidinium; VI: vilanterol

Figure 1: Scatter plots of SGRQ total score vs CAT score at baseline for (A) EMAX, (B) FULFIL, and (C) IMPACT



Conclusions

- The baseline regression models (between-patient) between CAT total score and SGRQ scores were similar across the three studies.
- This indicates a conversion algorithm may be developed based on the consistent relationship at a population level.
- Further validation activities (with other datasets and patient subgroups) would be of interest.

Acknowledgements

- Editorial support (in the form of writing assistance including preparation of the initial draft under direction and guidance of the authors, collating and incorporating authors' comments for each draft, assembling figures and tables, grammatical editing, and referencing) was provided by Fiona Goodwin and Rebecca Cunningham of Aura, a division of Spirit Medical Communications Group Limited and was funded by GlaxoSmithKline.

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