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POS0009

SUBJECTIVE ASSESSMENT OF PHYSICAL FUNCTION DOES NOT SUFFICIENTLY EXPLAIN VARIANCE OF MEASURED HAND FUNCTION AND GRIP STRENGTH IN ARTHRITIS PATIENTS AND NON-ARTHRITIS CONTROLS

A. M. Liphardt^{1,2}, K. Tascilar^{1,2}, B. Coppers^{1,2}, E. Manger¹, S. Liehr¹, L. Bieniek¹, S. Bayat^{1,2}, D. Simon^{1,2}, M. Sticherling^{2,3}, J. Rech^{1,2}, A. Hueber⁴, G. Schett^{1,2}, A. Kleyer^{1,2}. ¹University Hospital Erlangen & Friedrich-Alexander-University Erlangen-Nürnberg, Internal Medicine 3 - Rheumatology and Immunology, Erlangen, Germany; ²University Hospital Erlangen & Friedrich-Alexander-University Erlangen-Nürnberg, German Centre for Immunotherapy, Erlangen, Germany; ³University Hospital Erlangen & Friedrich-Alexander-University Erlangen-Nürnberg, Dermatology, Erlangen, Germany; ⁴Klinikum Nürnberg, Internal Medicine 5 - Oncology and Hematology, Nuremberg, Germany

Background: Monitoring disease activity in patients with inflammatory arthritis is essential for effective treatment. While the health assessment questionnaire (HAQ) is commonly used to assess physical function, additional functional tests, such as isometric grip strength and the Moberg Pick-Up-Test (MPUT), provide objective measures for hand function and allow assessing hand function across different diseases (1). It remains unclear to date, if measured hand function is already reflected by the HAQ, as the most widely used patient reported outcome measure of physical function in arthritis.

Objectives: To estimate the proportion of hand function and grip strength variability explained by HAQ, patient-reported hand function, and between-person variation in patients with inflammatory arthritis and non-arthritis controls.

Methods: Patients with rheumatoid arthritis (RA), psoriatic arthritis (PsA), psoriasis without PsA (PsO) and healthy controls (HC) were investigated. Subject characteristics (age, sex, disease) and HAQ were recorded. Hand function was assessed by vigorimetric grip strength, MPUT, and a patient-reported tool (Michigan Hand Questionnaire, MHQ). Mixed pure-random-effect linear regression models were used to estimate the proportion of variance in measured hand function or grip strength explained by subject characteristics (age, hand dominance, sex, reported hand function, disease group).

Results: 299 subjects were tested, 101 with RA (Age: 59.1±13.3 years, BMI: 27.2±5 kg/m², HAQ-DI score: 0.9±0.6), 92 with PsA (Age: 58.8±11.6 years, BMI: 29.6±1.1 kg/m², HAQ-DI score: 0.6±0.7) and 106 non-arthritis controls (51 with PsO (Age: 47.3±14.1 years, BMI: 29.8±7.3 kg/m², HAQ-DI score: 0.4±0.6) and 55 HC (Age: 54.6±16.5 years, BMI: 25.2±3.3 kg/m², HAQ-DI score: 0.1±0.2). Overall variation of MPUT is mostly accounted for by between-person variation (43.1%), followed by HAQ (20.3%) and MHQ (20.2%) (Figure 1A). Overall variation in grip strength is mostly accounted for by sex (59.8%), between-person variation (21.1%) and HAQ (11.3%) (Figure 1B). Overall variation in MHQ is mostly accounted for by HAQ (59.2%) and residual variation (28.3%). Study group specific result are summarized in Table 1.

Table 1. Variance proportions for each of the four study groups.

| Group | Variance proportions (%) | | | | | | | |
|---------------|--------------------------|------|------|------|---------------|------|------|------|
| | Hand function (MPUT) | | | | Grip strength | | | |
| | Control | PsA | PsO | RA | Control | PsA | PsO | RA |
| MHQ | 3.4 | 39.0 | 0.0 | 0.0 | 0.0 | 2.1 | 0.0 | 0.0 |
| ID | 34.8 | 36.2 | 51.6 | 52.8 | 16.1 | 12.9 | 21.3 | 27.9 |
| Age | 0.0 | 13.8 | 0.0 | 0.7 | 8.4 | 8.4 | 0.0 | 0.0 |
| HAQ | 35.8 | 10.8 | 34.3 | 16.4 | 3.8 | 3.1 | 10.3 | 12.0 |
| Dominant hand | 0.6 | 0.2 | 0.0 | 0.0 | 3.5 | 0.6 | 1.3 | 0.2 |
| Sex | 12.1 | 0.0 | 0.0 | 4.3 | 64.2 | 68.9 | 63.7 | 55.0 |
| Residual | 13.3 | 0.0 | 14.1 | 25.8 | 3.9 | 4.0 | 3.4 | 5.0 |

Conclusion: While the variance variation in grip strength is mainly explained by sex and between-person variation for all subject groups, the proportions of

explained variance for measured hand function is not similar between diseases. In all groups > 50% of the variation in measured hand function remains unexplained by the variables used. Especially in arthritis patients, HAQ explained less than 25% of the variance in measured hand function. Grip-strength can be considered a poor surrogate for hand function in this context due to its large gender dependence. The explainability of MHQ variation largely by HAQ indicates that it has limited potential to provide further information beyond overall functional impairment. In contrast, the large between-person variation in MPUT likely indicates unexplored movement patterns of hand motion that may be further dissected using sensor-based analyses (2) and can help identify movement components a potential for an in-depth assessment of subtle hand-function alterations in inflammatory arthritis.

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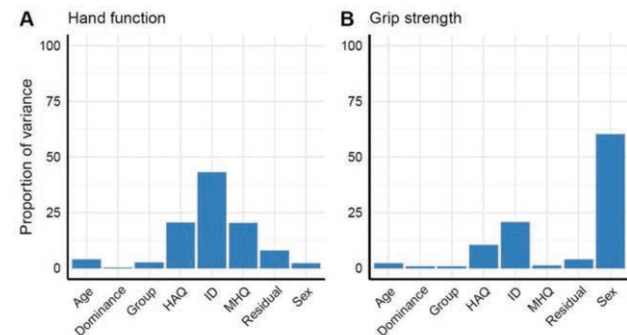


Figure 1. Overall (N=299) proportions of variance for (A) hand function by Moberg Pick-up Test (MPUT) and (B) grip strength. Dominance = dominant hand, HAQ = health assessment questionnaire, ID = individual, MHQ = Michigan Hand Questionnaire.

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POS0010

THE PSORIATIC ARTHRITIS 5-THERMOMETER SCALES (PSA-5Ts): A NEW INSTRUMENT FOR ASSESSING THE STATUS OF DISEASE ACTIVITY IN PSORIATIC ARTHRITIS

F. Salaffi¹, M. Carotti², S. Farah¹, M. Di Carlo¹. ¹Università Politecnica delle Marche, Dipartimento Di Scienze Cliniche e Molecolari, Ospedale "Carlo Urbani", Jesi, Italy; ²Università Politecnica delle Marche, Dipartimento di Scienze Radiologiche, Ospedali Riuniti, Ancona, Italy

Background: There are a variety of composite disease activity monitoring methods and patient-centered metrics available for psoriatic arthritis (PsA). The Psoriatic Arthritis 5-Thermometer scales (PSA-5Ts) is a new tool, proposed, with the aim of improving its diagnostic accuracy.

Objectives: The goal of this research was to evaluate data on the measurement qualities of the PSA-5Ts, a composite measure of disease activity in PsA patients, in a real-world scenario (Figure 1).

PSA-5Ts SCORING AND CALCULATION RULE

We want you to indicate how much your psoriatic arthritis impacts your health. Please tell us how you have been feeling this last week.

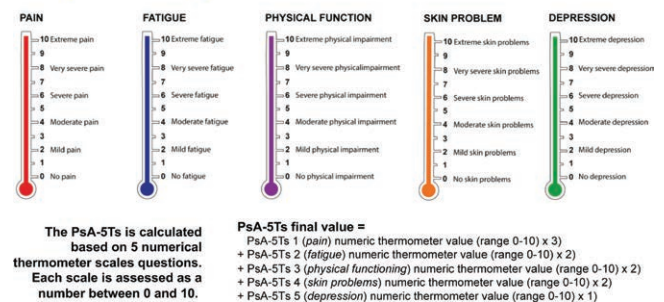


Figure 1. The Psoriatic Arthritis 5 Thermometer scales (PSA-5Ts) scoring and calculation rule