Rheumatoid Arthritis Disease Activity Index-5 (RADAI-5)

General Description

Purpose. The RADAI-5 is a patient-assessed measure for disease activity in rheumatoid arthritis. The RADAI-5 may complement of replace the physician's assessment of disease activity in health services or epidemiologic research, or may be used for patient management.

Content. The RADAI-5 is a 5-item questionnaire. The items ask about global disease activity in the last 6 months, current disease activity with respect to joint tenderness and swelling, arthritis pain, duration of morning stiffness, and general health.

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Versions. The RADAI-5 is analogous to the RADAI with replacement of joint counts by the patient's general health assessment and change of question format to an ordered category scale. Translations in German and English are available.

Number of items in scale. The RADAI-5 contains 5 items.

Subscales. None.

Populations. *Developmental/target.* Patients with RA.

Other uses. The RADAI-5 may be useful in other forms of inflammatory arthritis. A modified version of the RADAI-5 has been tested in patients with psoriatic arthritis

ACR Components. Patient assessment of pain, PtGA.

Administration

Method. Self-administered questionnaire. The RADAI-5 was devised to be self-explanatory.

Training. None.

Time to complete. Patient: < 1 minute; Provider: < 30 seconds; Laboratory: N/A.(29)

Equipment needed. None.

Availability/cost. The RADAI-5 is available free of charge.

Scoring

Responses.

Scale. All items are scored on a 0-10 ordered category scale. For items 1 and 2, 0 indicates "completely inactive" and 10 indicates "extremely active." For item 3, 0 indicates "no pain" and 10 indicates "unbearable pain." For item 4, 0 indicates "very good" health status and 10 indicates "very bad" health status. For item 5, 0 indicates "no stiffness" and 10 indicates "stiffness the whole day."

Score. The RADAI-5 is calculated as the mean of the non-missing items and ranges from 0-10.

Interpretation of scores. A RADAI-5 score of 0 means no RA disease activity with higher scores indicating higher levels of disease activity.

Method of scoring. The RADAI-5 can be scored by hand or with a calculator.

Training to score. None.

Training to interpret. None.

Norms available. Disease activity categories for the RADAI-5 have been proposed: 0.0–1.4 for a remission-like state, 1.6–3.0 for mild disease activity, 3.2–5.4 for moderate disease activity, and 5.6–10.0 for high disease activity.(29)

Psychometric Information

Reliability. *Test- retest reliability*. Test-retest reliability has not been proven.

Internal consistency. Cronbach alpha of 0.917 has been reported. Factor analysis by principal component analysis reveals the RADAI-5 to be a one-dimensional instrument with all items contributing significantly to the final score.(30)

Validity.

Content. The RADAI-5 items score the most apparent symptoms of RA with exception of joint scores. There are no physician derived measures of disease activity or laboratory parameters included.

Criterion. The RADAI-5 is significantly correlated with the original RADAI, CDAI, SDAI, DAS28-ESR, and DAS28-CRP ($P < 0.0001$). The kappa for the relationship between the RADAI-5 and the original RADAI was 0.882, with agreement for RADAI-5 as compared to DAS28-ESR, DAS28-CRP, SDAI, and CDAI 0.290, 0.337, 0.385, and 0.369, respectively.(30)

Predictive validity. Spearman's Rho demonstrated a linear relationship between change in RADAI-5 scores compared to change in DAS28-ESR (0.589, $P < 0.001$) and change in CDAI (0.569, $P < 0.001$). Moderate

kappa correlation for the relationship between change in RADAI-5 and change in DAS28-ESR (0.295) and change in CDAI (0.538) have been demonstrated.(30)

Convergent. RADAI-5 was significantly correlated with tender joint counts, swollen joint counts, and PrGA (rho = 0.598-0.747, P<0.001), however no significant relationship was found between RADAI-5 and acute phase reactant values. Spearman rank-correlations between RADAI-5 and RADAI demonstrate near perfect correlation (rho = 0.995, P < 0.001). Statistically significant correlations between the RADAI-5 and DAS28-ESR, DAS28-CRP, SDAI, and CDAI were also found with Spearman's rho ranging from 0.638 to 0.740 (P < 0.001).(30)

Responsiveness to change. Despite significant changes for individual patients, no significant changes were seen at the group level between 2 assessments done within 3 months.(30)

Comments and Critique

The RADAI-5 is short and easy for patients to understand and is a completely patient administered tool designed for feasibility in a busy clinical setting. The RADAI-5 improves upon the original RADAI in terms of simplicity of calculation and like the RADAI produces a single index of disease activity. Additionally, the disease activity categories of the RADAI-5 demonstrate a more normal distribution than DAS28 and CDAI scores.(31) Although the RADAI-5 lacks assessment of joint counts or physician derived components, it has been shown to correlate well with these measures on an individual basis as well as with

other composite measures which contain such items.(32) Additionally, omission of joint counts makes assessment faster and eliminates the inter-observer variation seen with joint counts. No relationship has been detected between the RADAI-5 and acute phase reactant values which diminishes the face validity of the composite measure.(32) Additionally, the RADAI and RADAI-5 were both validated only in Caucasian cohorts(30) and have not been evaluated in other ethnic groups. The RADAI-5 has not been used in the research setting and neither sensitivity to change nor relationships to disease outcomes, such as bony erosions or prediction of disability, have been proven.