Clinical Disease Activity Index (CDAI)

Purpose. The CDAI combines single measures into an overall, continuous measure of RA disease activity. It is feasible to use the CDAI for monitoring of RA disease activity in daily clinical practice and lack of a laboratory value may facilitate more routine evaluation of RA disease activity.

Content. The CDAI includes a 28-swollen joint count, 28-tender joint count, PtGA on a 10 cm VAS, and PrGA on a 10 cm VAS.

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Versions. The CDAI is analogues to the SDAI however excludes laboratory measurement of CRP.

Number of items in scale. The CDAI has 4 items.

Subscales. None.

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

Other uses. Not validated for other rheumatic disorders.

ACR core set components. Tender joint count, swollen joint count, PtGA, PrGA.

Administration

Method. Clinical assessment of joint counts and PrGA combined with self-administered patient assessment of disease activity.

Training. Training is necessary for reliable assessment of joint counts.

Time to complete. Patient: approximately 10 seconds; Provider: <2 minutes; Laboratory: N/A.

Equipment needed. None

Availability/cost. The CDAI is available free of charge; no specialized form is needed.

Scoring

Responses.

Scale. The 28-swollen and 28-tender joint counts each range from 0-28. The PtGA and PrGA each range from 0-10.

Score. The range of the CDAI is 0-76.

Interpretation of scores. The level of disease activity can be interpreted as remission (CDAI ≤ 2.8), low (2.8 < CDAI ≤ 10), moderate (10 < CDAI ≤ 22), or high (CDAI > 22).(5)

Method of scoring. The CDAI is calculated by adding the 4 items together.

Training to interpret. None

Norms available. Reference values are available, and are useful for the interpretation of the disease activity scores from individual patients, see "interpretation of scores."

Psychometric Information

Reliability.

Test-Retest. The test-retest reliability of the CDAI was not tested. The components of the CDAI are individually accepted as reliable in RA assessment.

Reproducibility. Reproducibility of the CDAI was evaluated in cross-sectional inception cohort of RA patients seen every 3 months for 1 year

(N = 91) and observational routine care cohorts (N = 279) with significant correlations (P < 0.001) as compared to DAS28, CDAI, and HAQ.(5) CDAI was sensitive in discriminating between different ACR response categories and HAQ change scores (P < 0.0001).(11)

Validity.

Content. The CDAI includes variable from the core set of measures used to assess outcomes in RA. No measures of disability or joint damage are included. The CDAI has been shown to correlate closely with the SDAI with only 5% of the variance in SDAI explained by CRP.(11) CDAI is highly related to patient reported pain (r = 0.671, P < 0.001).(8)

Criterion. In validation studies the CDAI showed correlation coefficients as compared to DAS28 of 0.89 (P < 0.001)(11) and the patient's assessment of pain on a VAS has also been shown to be significantly related to CDAI scores (R = 0.671, P < 0.001).(8) CDAI scores correlate with radiographic change as measured by Larsen scores (R = 0.59, P < 0.0001).(11)

Convergent. Median CDAI scores (10.7, range 0-42.10) are slightly lower (P < 0.001) than median SDAI scores (11.6, range 0.07-46.60) and demonstrate gender differential with median CDAI 11.3 (0.00-42.10, P < 0.001) in females and 7.1 (0.00-32.00, P < 0.001) in males.(8)

Responsiveness to change. The CDAI demonstrates a linear relationship with the HAQ/MHAQ (r = 0.47-0.56, P < 0.0001)(6) and demonstrates ability to discriminate degrees of ACR response.(11)

Comments and Critique

The CDAI was based on the SDAI which in turn was based on the DAS28. This measure was developed as a simple calculation of disease activity for use in the clinic at point of care. The CDAI constitutes a simple numerical addition of individual measures on their original scale, overcoming problems of transformations and weighting used in other composite indices. There is no need to use a calculator or computer for calculations. Like the SDAI, no functional or quality of life index was included in the CDAI.(6) Like the SDAI, one drawback of the CDAI is not all physicians perform detailed joint exams when assessing RA disease activity. Additionally, the CDAI does not include any laboratory measurement and thus all variables are easily available at point of care in the clinical setting which can in turn produce more consistency in timing and completeness of disease measurement. While exclusion of laboratory measurements decreases face and content validity of the composite measure, similar correlations to the DAS28 and HAQ have been demonstrated as well as discrimination between ACR response categories with and without the addition of CRP to the remaining variables.(6, 11) Additionally, although acute phase reactants correlate with long-term outcomes in RA, they have not been shown to contribute sufficient information in other composite scores to change judgment of disease activity.(11) Although gender appears to have a small effect on the CDAI score,(4) different disease activity cutoffs for male and female patients are not established.