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Letter to the Editor (Matters arising from published papers)

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Comment on: Development and validation of an alternative ankylosing spondylitis disease activity score when patient global assessment is unavailable

Dear Editor, We read with great interest the article by Ortolan *et al.* [1], titled 'Development and validation of an alternative ankylosing spondylitis disease activity score when patient global assessment is unavailable', in which the authors developed a simplified version of the ankylosing spondylitis disease activity score (ASDAS) [2] in its CRP version, replacing patient global assessment (PGA), in the original ASDAS formula, by the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) [3].

The ASDAS has proven to be a very useful tool for assessing disease activity in spondylitis, with excellent validity, discriminative capacity and responsiveness. The study by Ortolan *et al.* is very complete and solves the problem of calculating ASDAS when the PGA is not available. They propose to replace the PGA with the BASDAI in the ASDAS formula and obtain excellent agreement with the original ASDAS: Alt.-ASDAS=0.12×Q2 + 0.06×Q6 + 0.11×BASDAI+0.07×Q3 + 0.58×Ln(CRP + 1).

Previously, we adopted a similar approach to simplify the original ASDAS formula by replacing not only PGA but also individual questions of the BASDAI [4]. Our aim was to obtain a new formula (the BASDAI-based ASDAS – BASDAS) for use in previous data collections or in other retrospective studies where individual items of the BASDAI were not available. Another possible use is when automatically extracting outcomes from hospital medical records: these usually include the patient BASDAI but not individual items of the BASDAI, and the BASDAS could thus be calculated instead of the ASDAS. The BASDAS uses only the BASDAI score and CRP: BASDAS=0.393 ×BASDAI+0.58×Ln(CRP + 1).

The objective of these two studies was to obtain a simplified ASDAS for use when the PGA or individual questions from the PGA and the BASDAI are not available. Thus, the new score must demonstrate good agreement with the original index. Applying the OMERACT filter (truth, discrimination and feasibility) is fundamental for the development of new outcome measures, but in this case, agreement with the original index is the most important feature.

Ortolan *et al.* used two cohorts of patients (development: $n = 1026$; and validation: $n = 1059$) for their analysis. In our case, we used 3359 patients for validation of the BASDAS. We have tested the features of the new Alt.-ASDAS score in our cohort and examined the level of agreement with the original ASDAS.

Table 1 shows the value of the different scores, their mean value (SD), intraclass correlation coefficient (ICC), standard error of the mean (SEM), minimal detectable change (MDC), and results from Bland–Altman analysis (bias and lower and upper limits of agreement). The results reported by Ortolan *et al.* for their patients are also included.

As shown in Table 1, the Alt.-ASDAS results in the two patient cohorts are very similar. As expected, because BASDAS is a more simplified formula than Alt.-ASDAS, the Alt.-ASDAS results are better than those of BASDAS and achieved high agreement with the original ASDAS. Thus, we confirm the good agreement level of Alt.-ASDAS in our cohort.

In our study, we expected the PGA to be highly correlated with the BASDAI. Ortolan *et al.* proposed a

Table 1 Value of different scores and results from Bland–Altman analysis (bias and lower and upper limits of agreement)

Score	Mean (S.D.)	ICC (95%CI)	S.E.M.	MDC	Bland–Altman		
					Bias	Low	Upp
ASDAS	2.62 (1.07)						
Alt.-ASDAS[a]	2.57 (1.07)	0.98 (0.98, 0.98)	0.03	0.07	0.05	−0.34	0.44
Alt.-ASDAS[b]		0.98 (0.98, 0.99)			0.06	−0.32	0.43
BASDAS	2.69 (1.13)	0.96 (0.95, 0.96)	0.07	0.19	−0.07	−0.71	0.56

[a]Alternative-ASDAS in our cohort. [b]Results reported by [1] in their validation cohort. Mean value (S.D.), intraclass correlation coefficient (ICC), S.E.M., minimal detectable change (MDC), and results from Bland–Altman analysis (bias and lower and upper limits of agreement).

conversion ratio between PGA and BASDAI of 0.99, very close to 1, so these outcomes can be treated as interchangeable in the ASDAS formula. In our cohort, this ratio was slightly inferior (0.91), but the agreement results were very similar.

Simplified formulas for the ASDAS (Alt.-ASDAS and BASDAS) produce similar results to the original score that can be used interchangeably. The indicated use of these scores would be as follows: first, the original ASDAS score; second, Alt.-ASDAS if the PGA is not available; and third, BASDAS if individual BASDAI questions are not available. None of these alternative scores should replace the original ASDAS, which has, since its appearance in 2009, proven to be a valid and reliable tool, widely used in research and daily clinical practice.

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Data availability statement

Data are available upon reasonable request by any qualified researchers who engage in rigorous, independent scientific research, and will be provided following review and approval of a research proposal and Statistical Analysis Plan (SAP) and execution of a Data Sharing Agreement (DSA). All data relevant to the study are included in the article.

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