

LETTER TO THE EDITOR

The Spanish version of the coma recovery scale-revised: Events on a correct timeline

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The assessment of the degree of consciousness has traditionally posed a challenge for clinicians. Different structured scales have been presented to quantify the severity of the disorder of consciousness. The Glasgow Coma Scale (GCS), the Disability Rating Scale (DRS), the Coma Recovery Scale, later revised (CRS-R) and the Loewenstein Communication Scale (LCS) [1] are good examples. However, the interpretation of the patients' reactions has been reported to be dependent on the variability of their behaviour and arousal level, but also on the examiner [2]. This sensitivity urges to minimize the factors that can lead to misinterpretation of the signals. In this regard, the use of assessment tools in native language may help clinicians to avoid mistakes derived from particularities of each language. In a recent paper, Tamashiro et al. [3] have presented a validation of a Spanish version of the CRS-R. The concurrent validity of the translated scale with the GCS and the DRS and its inter-rater reliability are presented. However, the authors stated that no Spanish version was available at the moment of publication, which is not true. A Spanish version of the CRS-R was published 2 years before by our group [4], in a prospective study with a cohort of patients who presented disorders of consciousness after severe brain injury. The scale was also used for assessing patients in vegetative state and minimally conscious state in a randomized placebo-controlled trial to determine the effectiveness of a single daily dose of Zolpidem [5]. To create our version, the CRS-R was back-translated to Spanish and refined by four clinicians, who finally agreed on the definitive version. This version was, in fact, provided as a supplementary appendix to the article and is available for examination. A similar method has been used by our colleagues to create their version. We regret that a simple search in a scientific library engine (as PubMed.gov) before the elaboration of the second Spanish version of the CRS-R including the keywords 'coma recovery scale revised Spanish' would have displayed our paper, thus avoiding duplication of efforts. The variability of the patients' behaviour, the difficulties in detecting subtle

Table I. Comparison of the participants in both studies.

	Participants of the study by Noé et al. [4]	Participants of the study by Tamashiro et al. [3]
Age (years)	40.2 (16–64)	30.0 (18–62)
Chronicity (days)	118 (38–370)	146 (28–1154)
Gender (n, %)		
Males	22 (68.8%)	23 (65.7%)
Females	10 (31.3%)	12 (34.3%)
Aetiology (n, %)		
Traumatic brain injury	15 (46.9%)	24 (68.6%)
Stroke	12 (37.5%)	4 (11.4%)
Anoxia	5 (15.6%)	6 (17.1%)
Tumour	0 (0%)	1 (2.9%)
CRS-R	8.47 ± 7.74	9.31 ± 4.39
DRS	23.59 ± 2.45	23.20 ± 1.89

changes and to unambiguously interpret them could be better coped with more collaboration between groups. In this case, it could have led to a greater sample, which could have helped both groups to extract more reliable conclusions.

As a proof, we assessed the concurrent validity of the CRS-R, the GCS, the DRS and the LCS using the data derived from the initial assessment of our study. Interestingly, participants were very similar in both studies (Table I).

While all the participants in our study ($n = 32$) were assessed with the CRS-R, the DRS and the LCS, only participants with traumatic brain injury ($n = 15$) were assessed with the GCS. Replicating the procedures of the study by Tamashiro et al. [3], we estimated the Spearman correlations of the scores of the three scales collected from the participants in our study. Surprisingly, the correlation coefficient between our version of the CRS-R and the DRS ($r = -0.53$, $p < 0.01$) was almost equal to their finding ($r = -0.54$, $p < 0.01$). This tendency was also supported by the correlation with the LCS ($r = 0.71$, $p < 0.01$). However, we did not find significant correlation with the GCS. The limited sample of participants assessed with this scale and the lower sensitivity of the GCS to small changes could have led to this result [1]. This was evidenced by the fact that 12 participants (80%) had a score of three in this scale in the baseline.

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In conclusion, we commend the authors for their work at validating their version of the scale, but we encourage them to better research previous work. This could have avoided not only the replication of work, which seems to be evidenced by the similar characteristics of both versions, but also the dilemma for Spanish-speaking clinicians of choosing one version or another.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

References

1. American Congress of Rehabilitation Medicine BI-ISIGDoCTF; Seel RT, Sherer M, Whyte J, Katz DI, Giacino JT, Rosenbaum AM, Hammond FM, Kalmar K, Pape TL, et al. Assessment scales for disorders of consciousness: Evidence-based recommendations for clinical practice and research. *Archives of Physical Medicine & Rehabilitation* 2010;91:1795–1813.
2. Schnakers C, Vanhaudenhuyse A, Giacino J, Ventura M, Boly M, Majerus S, Moonen G, Laureys S. Diagnostic accuracy of the vegetative and minimally conscious state: Clinical consensus versus standardized neurobehavioral assessment. *BMC Neurology* 2009;9:35.
3. Tamashiro M, Rivas ME, Ron M, Salierno F, Dalera M, Olmos L. A Spanish validation of the Coma Recovery Scale-Revised (CRS-R). *Brain Injury* 2014;28:1744–1747.
4. Noe E, Olaya J, Navarro MD, Noguera P, Colomer C, Garcia-Panach J, Rivero S, Moliner B, Ferri J. Behavioral recovery in disorders of consciousness: A prospective study with the Spanish version of the Coma Recovery Scale-Revised. *Archives of Physical Medicine & Rehabilitation* 2012;93:428–433 e12.
5. O'Valle M, Moliner B, Navarro MD, Balmaseda R, Colomer C, Ferri J, Noé E. Accepted Abstracts from the International Brain Injury Association's Ninth World Congress on Brain Injury. *Brain Injury* 2012;26:519.