

Criteria for classifying the severity of Degenerative Cervical Myelopathy into mild, moderate and severe according to the Myelopathy Disability Index

Background: There are currently no cut-off values in the Myelopathy Disability Index (MDI) to classify the severity of degenerative cervical myelopathy (DCM).

Research question: What are the cut-off points on the MDI for classifying the severity of DCM into mild, moderate and severe?

Design: Observational prospective study

Methods: 64 patients diagnosed with DCM underwent a preoperative and two postoperative physical examinations. Anthropometric, diagnostic and neurological variables were collected and functional and quality of life scales were administered.

ROC curve statistical analysis was performed and the modified Japanese Orthopaedic Association (mJOA) scale was used as the anchor.

Validation of the cut-off points was performed using the ANOVA statistical test, and the chi-square test was used to analyse whether the severity groups found were related to the different levels of the Nurick scale.

Results: 64 patients (23 women) participated, with a mean age of 61.97 (SD 11.57) [range 34-83]. The mean MDI was 7.36 (SD 6.66) and 14.08 (SD 2.57) in the mJOA.

The cut-off values found for mild-moderate were between 4 and 5, whereas for moderate-severe were between 7 and 8 (Table 1). Regarding the validity of the cut-off points, it was shown that patients with greater severity had significantly lower functionality than patients with the mild form of the disease, which was measured in both the 30 Meter Walking Test (30MWT) and the Nine Hole Peg Test (9HPT) (Table 2). The groups obtained also demonstrate a significant relationship with the Nurick scale ($p = 0.000$).

Discussion: being a clinician-oriented measure, the mJOA scale may entail some subjectivity, potentially misclassifying the severity of DCM and affecting the surgeon's decision making, whereas the MDI is more patient-oriented and has a stronger reference to day-to-day activities.

A score of 0 to 4 on the MDI would correspond to mild DCM, 5 to 7 would be moderate and severe from 8 to 30.

Table 1: Cut-off points and their corresponding Area Under the Curve (AUC), sensitivity and specificity values

Cut-off point mild-moderate	4-5	AUC = 0.805
		Sensitivity = 0.853
		Specificity = 0.6
Cut-off point moderate-severe	7-8	AUC = 0.862
		Sensitivity = 0.857
		Specificity = 0.684

Table 2: Mean values and standard deviations of the functional tests and corresponding ANOVA tests

	0 ≤ MDI ≤ 4	5 ≤ MDI ≤ 7	8 ≤ MDI ≤ 30	P - Value
30MWT	34.38 ± 7.12	44.85 ± 12.62	84.1 ± 83.22	0.004
9HPT der	35.1 ± 9.7	44.56 ± 10.85	68.93 ± 55.98	0.005
9HPT izq	38.8 ± 8.54	41.73 ± 12.69	63.57 ± 55.32	0.043