

# MOTOR UNIT NUMBER ESTIMATION (MUNE) IN PATIENTS WITH CHRONIC DISIMMUNE NEUROPATHIES

## OBJECTIVE

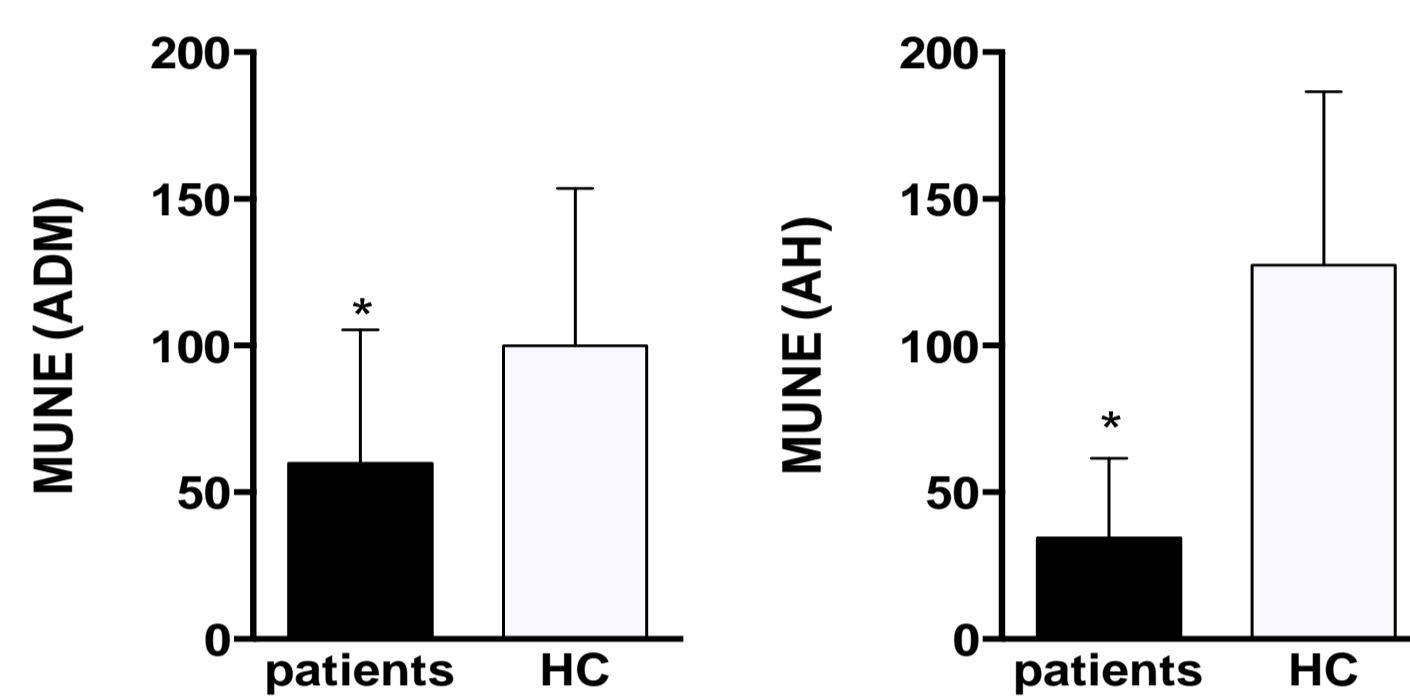
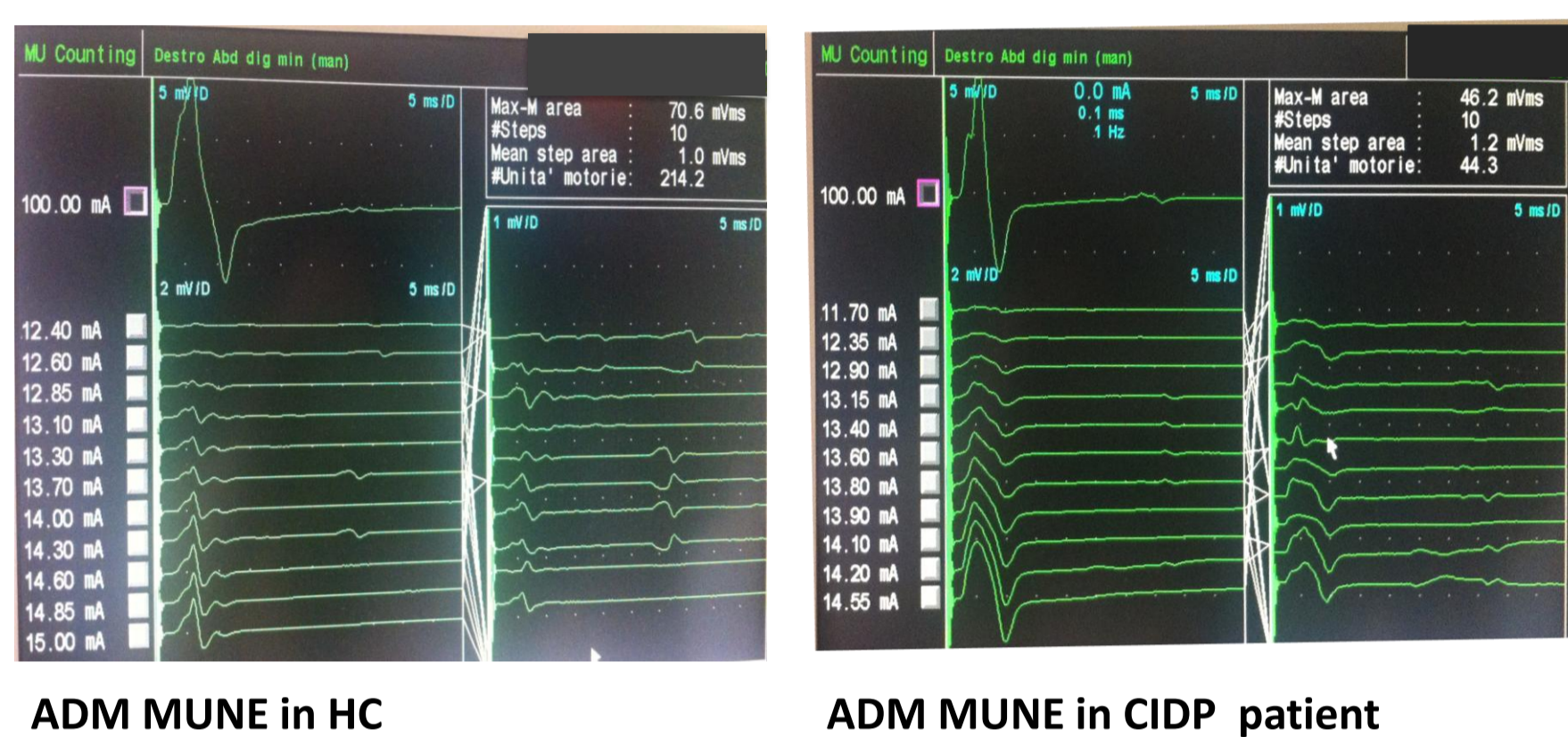
The only electrophysiological parameter currently used to describe axonal loss in neuropathies is the amplitude of distal cMAP. We aimed to analyse motor unit number estimation (MUNE), a technique that provides information on the number of functional motor units, in a sample of patients affected by chronic disimmune neuropathies. Furthermore we aimed to investigate the relation between axonal loss and other relevant clinical and functional measures in these patients.

## METHODS

55 subjects were included in this study. 30 patients with a diagnosis of Disimmune Neuropathy (23M, aged 59.4±14.8), were recruited in our Unit of Disimmune Neuropathies. Patients with history of radiculopathy and other causes of neuropathies were excluded. 25 age and sex-matched healthy controls (HC), (15M, aged 54.0±15.1) served as reference population. Patients were described for age, sex, disease duration; they underwent clinical assessment of disability by mean of Medical Research Council (MRC) grading system, INCAT motor sum score and Fatigue Severity Scale (FSS). Electrophysiological evaluation was performed by a different neurologist of the Unit, unaware of patients' clinical condition. In order to standardize electrophysiological results, the right limbs were selected for each exam, irrespectively of the distribution of motor deficit. Stimulation and recordings sites were standardized. The distal compound muscle action potential (cMAP) amplitudes, distal latency, distal area and nerve conduction velocity were determined. Motor unit number estimation (MUNE) of the abductor digiti minimi (ADM) and abductor hallucis (AH) was performed using the manual area incremental method described by McComas et al (1) in all sites where distal cMAP was recordable.

## RESULTS

### MUNE IS ALTERED IN PERIPHERAL DISIMMUNE NEUROPATHIES

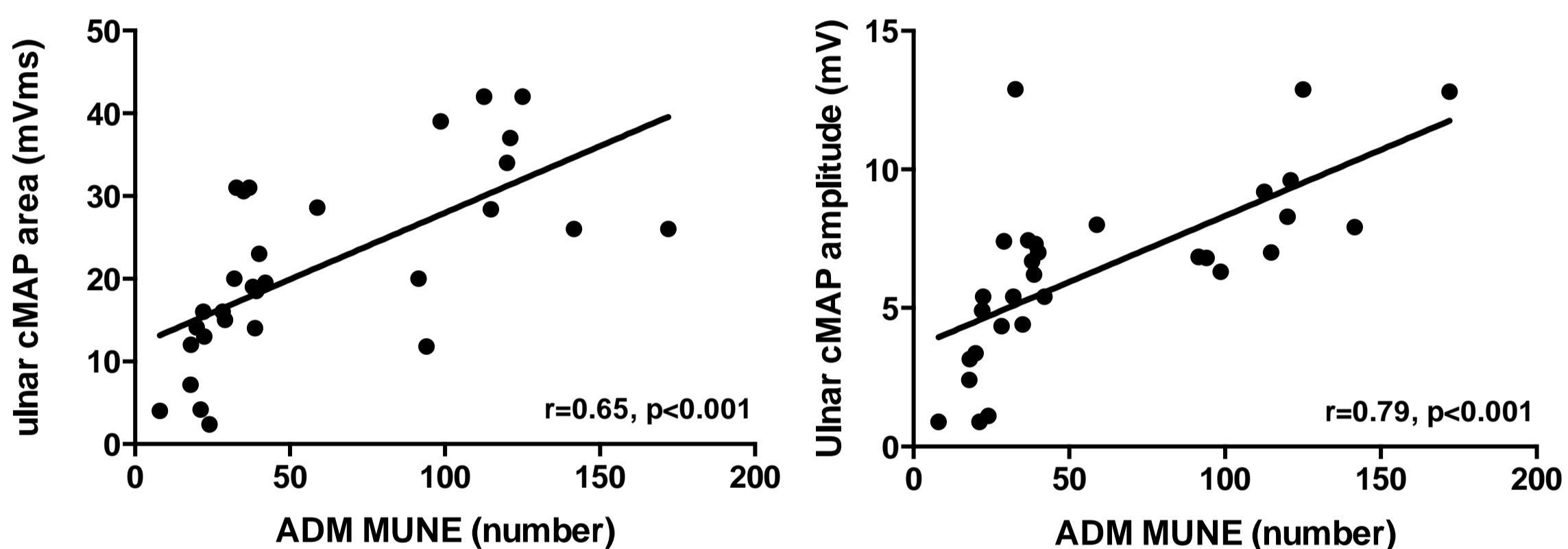


MUNE was reduced both in the upper and lower limb in neuropathic patients respect to HC

Variable	OR	SE	p	CI
ADM MUNE	0.98	0.006	0.02	0.97 - 0.99
gender	1.59	1.06	0.48	0.43 - 5.86
age	1.00	0.20	0.92	0.96 - 1.04

In a multivariate logistic regression analysis ADM MUNE was independently able to discriminate patients from HC

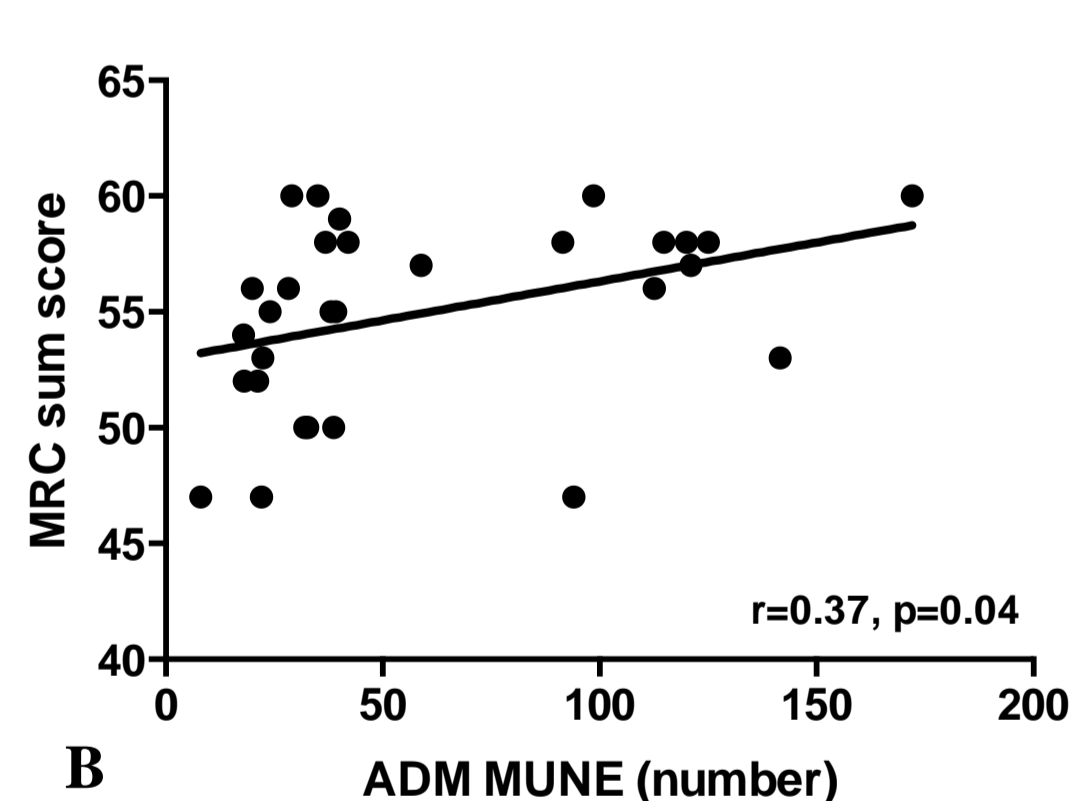
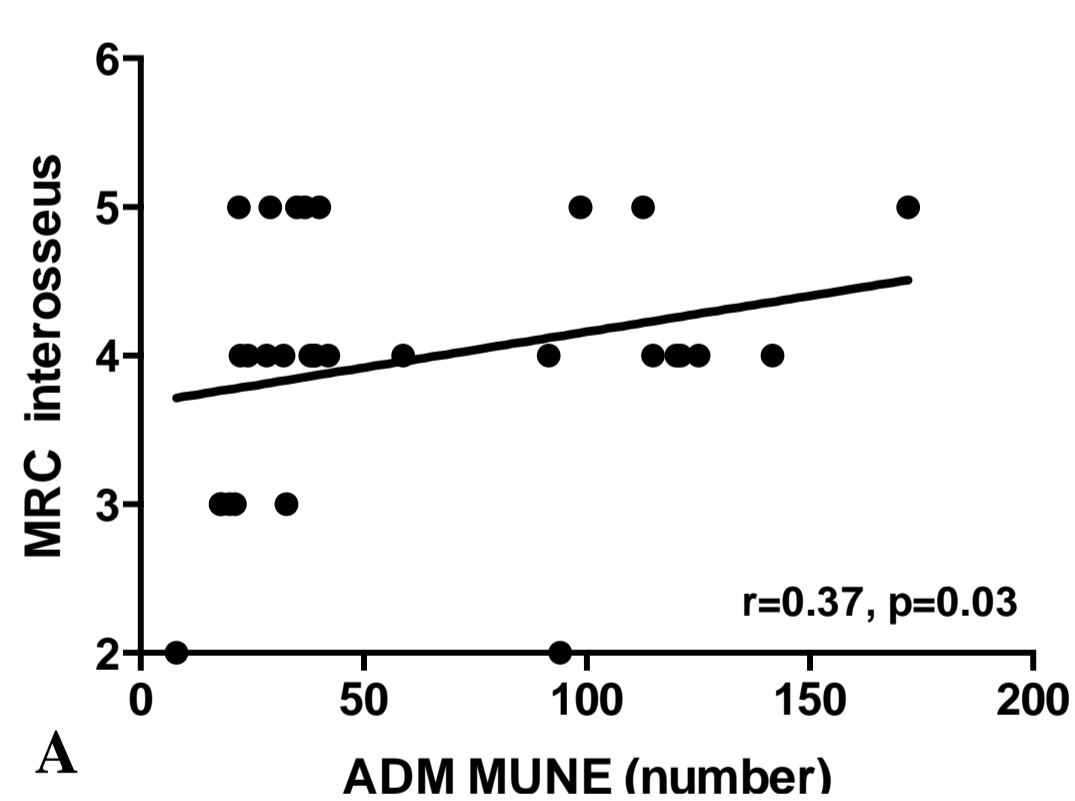
### MUNE CORRELATES WITH CORRESPONDENT DISTAL CMAP PARAMETERS



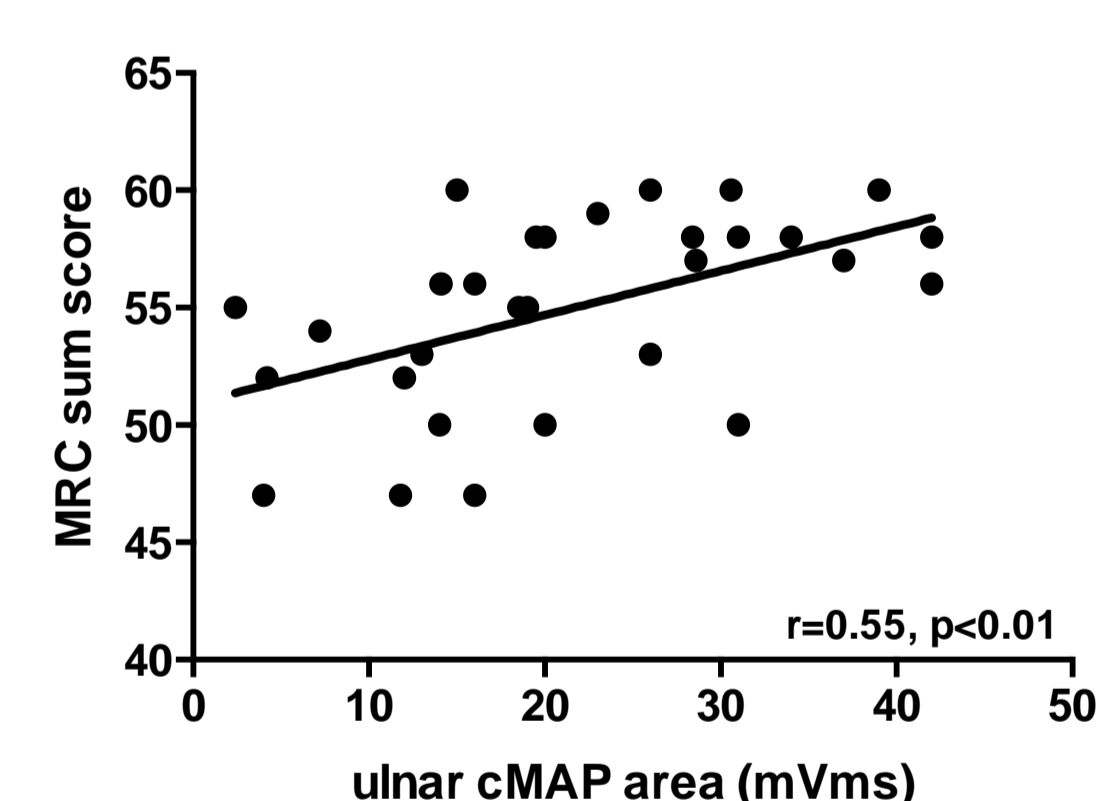
A linear multivariate regression analysis, including demographic and clinical variables as covariates, confirmed ADM MUNE as independent predictor of ulnar cMAP amplitude.

Variable	coefficient	SE	p	CI
ADM MUNE	0.05	0.01	<0.001	0.03-0.07
gender	-0.43	1.01	0.67	-2.52 - 1.65
age	0.53	0.02	0.05	-0.001-0.1
disease duration	0.10	0.06	0.15	-0.03 - 0.23

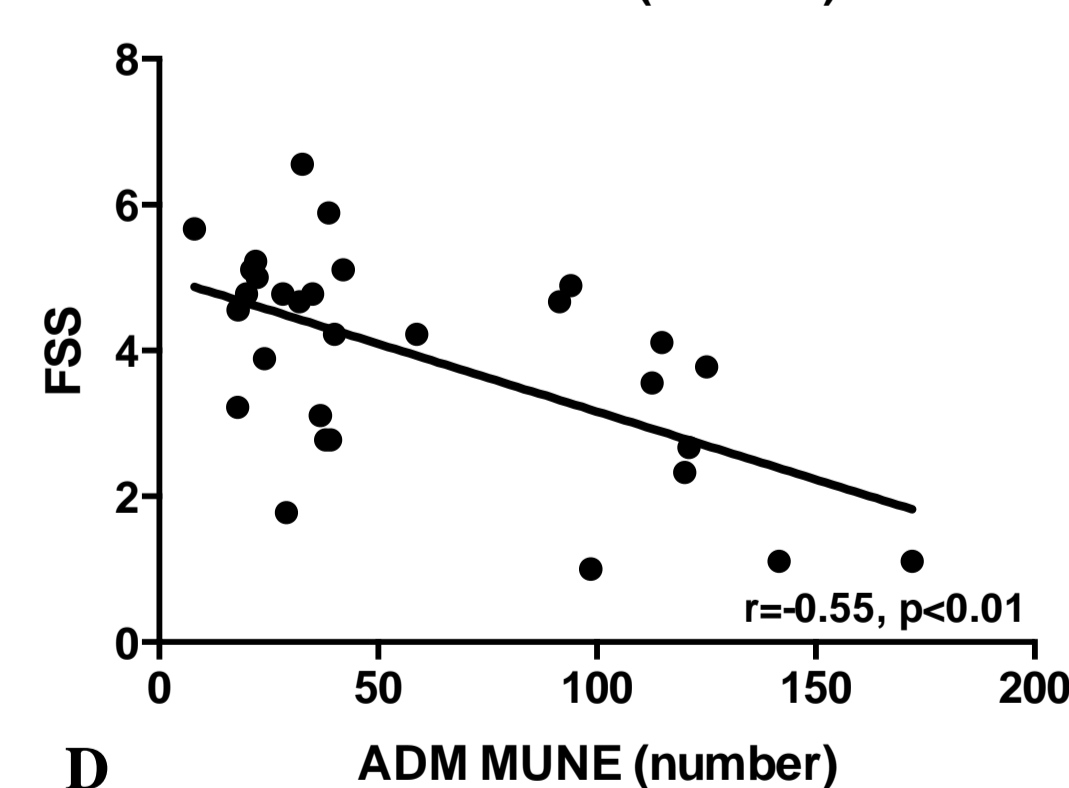
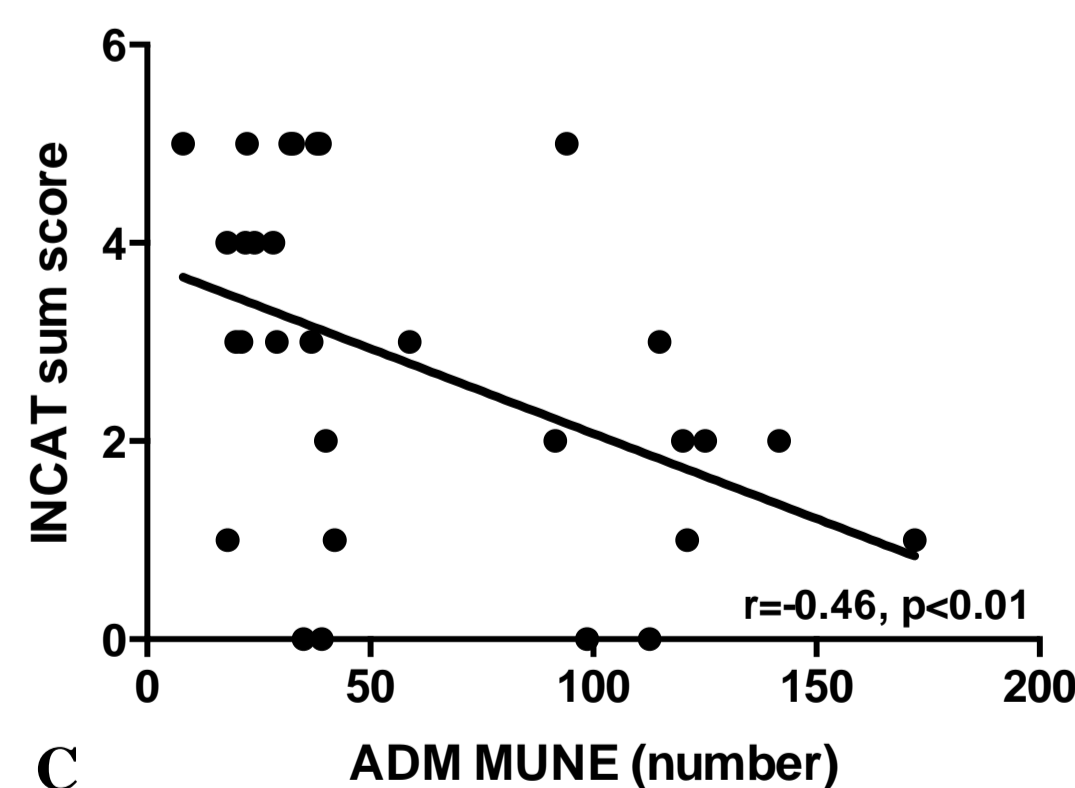
### MUNE AND DISTAL cMAP AREA CORRELATE WITH DISABILITY SCORES IN PATIENTS AFFECTED BY PERIPHERAL DISIMMUNE NEUROPATHY



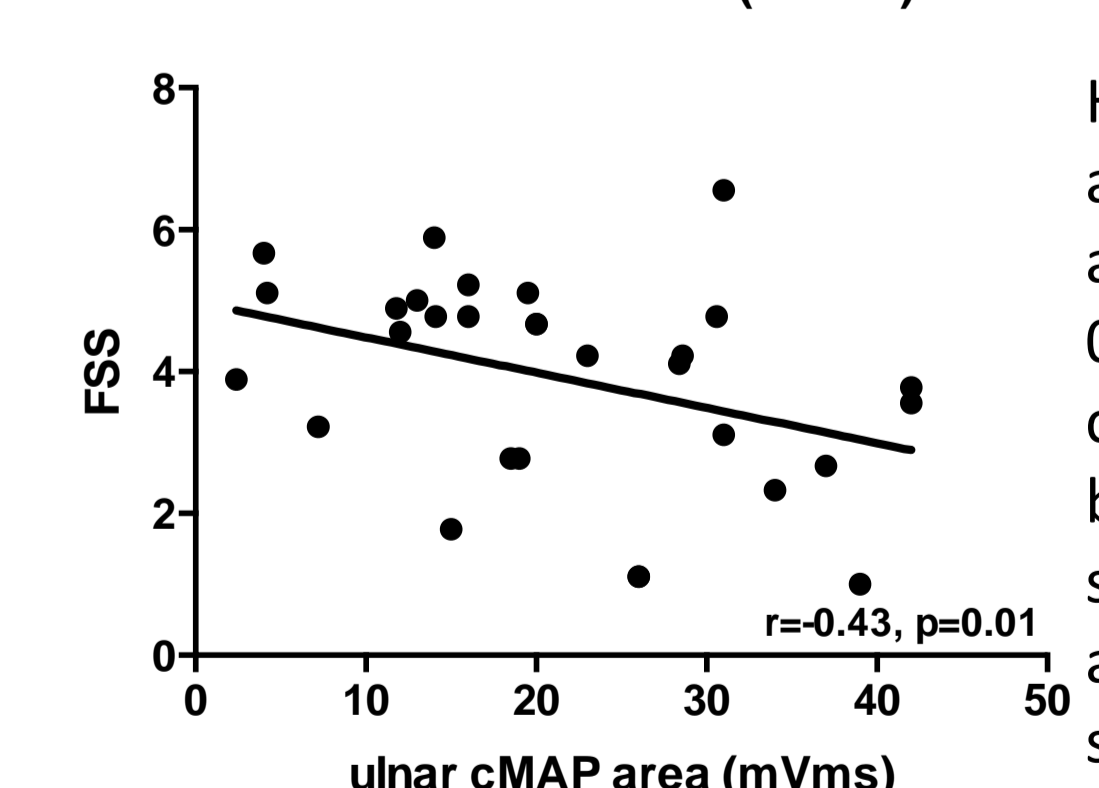
A positive correlation was found between ADM MUNE and distal MRC score of the correspondent arm (A), confirming the efficacy of MUNE in describing the number of functional motor units. Of note, ADM MUNE was also correlated with total MRC score (B).



A positive correlation was also revealed between global MRC score and ulnar distal cMAP area and amplitude (r=0.38, p=0.03).



Lower ADM MUNE value was associated to higher disability expressed by total motor INCAT score (C) and to subjective perceived clinical fatigue expressed by FSS (D)



Higher FSS score was associated to lower cMAP area and amplitude (r=-0.46, p=0.01). A positive correlation was also found between total motor INCAT score and distal ulnar cMAP area (r=-0.50, p=0.01, not shown).

## CONCLUSIONS

- MUNE and distal cMAP area, besides distal cMAP amplitude, can further highlight the pathophysiological process that undergoes chronic disimmune neuropathies, by quantifying the number of functional motor units (MUNE) and the efficacy of their neurogenic rearrangement (cMAP area).
- We suggest that MUNE and cMAP area of the upper limb could be correlated to global strength and disability in chronic disimmune neuropathies
- We intend to follow-up longitudinally these patients to evaluate the prognostic value of MUNE estimation.