Utility of Motor Unit Number Estimation as a biomarker of ALS Progression

Dr. Divya Rani, Dr S.K.Chandan, Department of Neurology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi

Introduction

- Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disorder and most patients within 3-5 years of diagnosis.
- Motor unit number estimation (MUNE) is a type of electrophysiological study that measures an approximate number of LMNs innervating a single muscle or small group of muscles.
- Motor unit numbers begin to drop before the onset of clinical weakness, and changes in this can be used as an outcome measure in clinical trials.

Materials and methods

- Single-centre, prospective, hospital-based observational study conducted over 18 months.
- Patients diagnosed with Definite or probable ALS as defined by the Revised El Escorial Criteria, were included in the study.
- MUNE was calculated at baseline and at 6 months and rate of decline in MUNE was calculated.
- The multi-point incremental method was used to calculate MUNE.
- Either the median or ulnar nerve in one upper extremity was selected for study. Surface recording electrodes were placed on the abductor pollicis brevis (innervated by the median nerve) or the abductor digiti minimi (innervated by the ulnar nerve) using a standard belly-tendon montage.

Results and Conclusion

MUNE	Mean ± SD	Median (25th-75th percentile)	Range	P value*
At baseline	16.36 ± 5.22	16.4 (12.55-18.765)	5.4-28.4	<0.0001
At 6 months	13.37 ± 4.96	13.51 (10.78-15.45)	1.14-22.4	

- At baseline, the mean value of MUNE was 16.36 ± 5.22 which significantly reduced to 13.37 ± 4 .96 at 6 months.
- Our study demonstrated a significant reduction in MUNE over six months, indicating disease progression.