

Composite serum and CSF biomarker index correlated with clinical features for predicting ALS progression: a multivariate analysis



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Objectives

ALS is a progressive neurodegenerative disease; this study explores serum and CSF biomarkers as non-invasive predictors of progression for prognostic stratification and monitoring.

Materials and methods

A linear OLS regression model was applied to 134 ALS patients during 2021–2025 to evaluate biomarker prognostic value.

Using training/testing data split, the model assessed associations between biomarker levels and disease progression rate, measured by Δ FS.

Results

Cortisol, neutrophil-to-lymphocyte ratio, and CSF NFL correlated positively with Δ FS ($R^2=0.73$) and were combined into a composite prognostic model.

Discussion and conclusions

Clinimetric scales alone may poorly predict ALS progression; integrating them with biological markers enhances longitudinal monitoring.

The model's applicability is limited by sample size and geographic restriction, requiring validation in larger, diverse cohorts for improved prognostic accuracy.

References

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3. Leone MA, et al. - The Pooled Resource Open Access ALS Clinical Trials Consortium, Fontana A. - Neutrophils-to-Lymphocyte Ratio Is Associated with Progression and Overall Survival in Amyotrophic Lateral Sclerosis - Biomedicine s - 2022 - 1:10(2) - 354

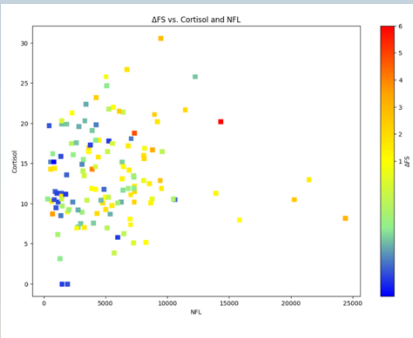


Fig. 1 scatter-plot Δ FS vs serum cortisol levels and CSF neurofilaments light chains (NFL)

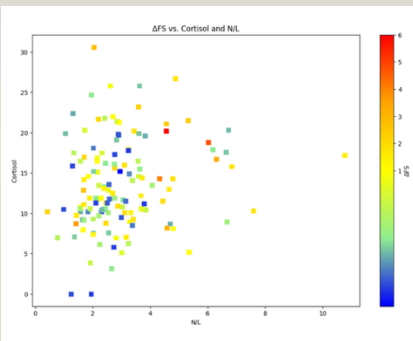


Fig. 2 scatter-plot Δ FS vs serum cortisol levels and neutrophil-to-lymphocyte ratio (NLR)

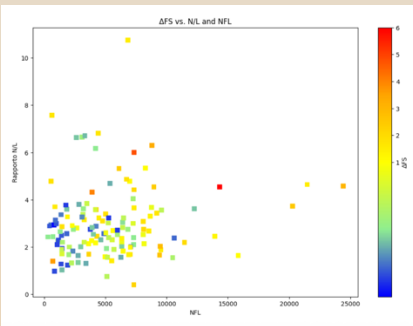


Fig. 3 scatter-plot Δ FS vs neutrophil-to-lymphocyte ratio and CSF neurofilaments light chains



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