Evaluation of the potential role of UCHL1 and GFAP as diagnostic and prognostic biomarkers in Motor Neuron Diseases

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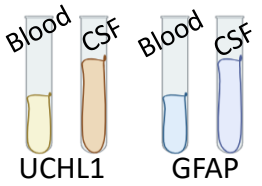
Background

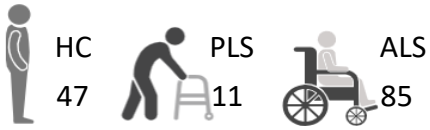
GFAP, a marker of astroglial activation, and UCHL1, a neuronal injury marker, have shown promise in ALS as indicators of neuroinflammation and neurodegeneration.

Objective



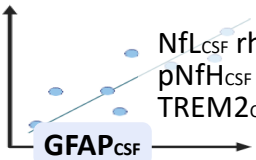
- Can discriminate between ALS and PLS patients?
- Correlate with clinical features and disease progression?

Methods

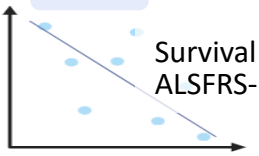


CSF and blood samples were collected at diagnosis and biomarker measured using ELISA

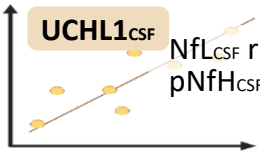
Results



NfL$_{CSF}$ rho = 0.30, p = 0.0057
pNfH$_{CSF}$ rho = 0.30, p = 0.0080
TREM2$_{CSF}$ rho = 0.35, p = 0.0142



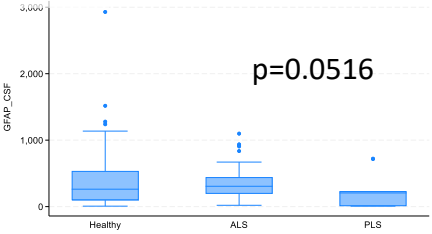
Survival time rho = –0.31, p = 0.0061
ALSFRS-R score rho = –0.26, p = 0.0197

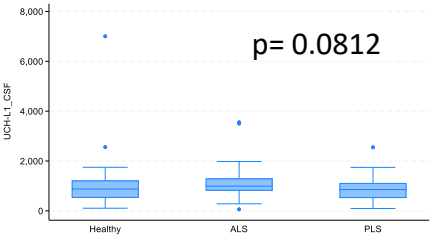


NfL$_{CSF}$ rho = 0.41, p = 0.0002
pNfH$_{CSF}$ rho = 0.34, p = 0.0026

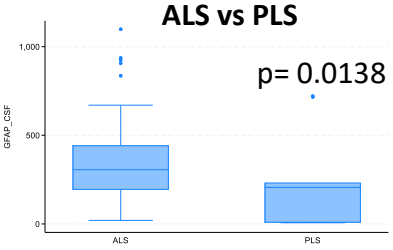
Neither GFAP nor UCHL1 correlated with disease progression rate or pulmonary function.

HC vs ALS vs PLS





ALS vs PLS



Discussion

UCHL1$_{CSF}$ correlated with neurofilament, but did not differ between ALS and PLS
➔ Limited diagnostic utility.
GFAP$_{CSF}$ was elevated in ALS and showed association with functional decline and shorter survival
➔ Potential diagnostic and prognostic biomarker.
These results support the involvement of astroglial activation in ALS pathophysiology and highlight the potential of GFAP to complement existing neurodegenerative biomarkers.

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