Title: High Parameter Immune Profiles Evaluated by Time of Flight Mass Cytometry Demonstrate a Pro-inflammatory Profile in a Pilot Study of Individuals With ALS Compared To Healthy Controls

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Abstract:

Background: Amyotrophic Lateral Sclerosis (ALS) is a fatal, progressive neurodegenerative disease. Although genetic causes have been identified, the majority of cases of ALS are sporadic in origin. Recent findings, however, have identified neuroinflammation and altered immune responses as important pathological contributors. Hypothesis: We hypothesized that immune dysfunction occurred in ALS, and that the degree of dysfunction correlated with disease severity. Methods: We used time of flight mass cytometry to identify immune cell subsets isolated from the blood of 12 ALS patients and 6 healthy age matched controls. Clusters were formed based on X-shift cell subset analysis, and SpadeVizR analysis was used to identify the phenotype and abundance of clusters from each sample. Results: We identified specific clusters that were present at higher frequencies in ALS patients as compared to controls, primarily clusters representing CD8+ cytotoxic T cells and dendritic cells; in contrast, we found lower abundance of clusters representing CD4+ T helper and NK cells in ALS patients.
Discussion: In this small pilot study we demonstrated that patients with ALS demonstrated a relative increase in the abundance of pro-inflammatory and activated immune cells and a relative decrease in anti-inflammatory cells, supporting the view that immune system dysfunction may play a role in the neuropathology of ALS.