Developing an assay for easy and rapid detection of ALS biomarker(s): A Hypothesis

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Background: Death of motor neurons is the key pathology underlying neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS). Biomarkers are chemical changes in the biological fluids. Biomarkers serving as a diagnostic tool should be specific to the concerned disease. Biomarkers indicating disease progression should be very sensitive to demonstrate changes during the disease process as well as therapeutics development. Biomarkers proposed for ALS include poly (GP) repeats in C9orf72, neurofilaments, miRNAs, glutathione and 4HNE in CSF, SOD1/TDP43 protein, poly (GP) repeats in C9orf72, neurofilaments, T regulatory cells, CRP, chitotriosidase, creatinine, creatinine kinase, miRNAs, glutamate, albumin, uric acid, glutathione, ferritin, 3-nitrotyrosine and 4HNE in blood, p75ECD, F2-isoprostane, collagen type 4, lucosylgalactosyl hydroxylysine, neoptrin and 8hydroxy-2`-deoxyguanosine in urine. Our hypothesis is to develop a kit-based assay for detection of ALS. Lateral flow immunoassays are one of the rapid, point-of-care diagnostic tests enabling high sensitivity and multiplexing.
Methods: Leftover biological samples of ALS/Non-ALS individuals can be obtained from the clinics, age group 40-90. The samples can be evaluated for the expression of biomarkers and the levels can be compared between ALS and Non-ALS individuals. Using this preliminary data, kit-based assay can be developed that might be based on lateral flow principle.
Result: The assay developed should be chromogenic and the intensity of chromogen should indicate the disease severity when compared to the reference.
Conclusion: Development of a successful kit-based assay will enable its rapid and easy detection and establish a new milestone in the field of ALS.

Keywords: Amyotropic Lateral Sclerosis; Biomarkers; Lateral Flow Immunoassay