PARKINSON'S PROGRESSION MARKERS INITIATIVE

Play a Part in Parkinson's Research

Apolipoprotein A1 (ApoA1) and Epidermal Growth Factor (EGF) as Plasma-based Biomarkers in Parkinson's Disease

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Summary (or Abstract)

Suggested 200 words maximum

We assayed plasma from 100 normal controls as well as 154 PD individuals from the PPMI study at 3 timepoints (baseline, 6 mo, 12 mo) for epidermal growth factor (EGF) and Apolipoprotein A1 (ApoA1). EGF was measured using an enzyme-linked immunosorbent assay (ELISA) routinely used in our lab, while ApoA1 was measured using a clinical immunoturbidimetric assay. In the past, we have seen that low EGF levels correlate with poorer cognitive performance in PD patients (Chen-Plotkin et al., 2011) -- we sought to determine this also holds true in PPMI subjects. We have also previously observed that higher ApoA1 levels have a "protective effect" in PD -- correlating with increased age at disease onset and better levels of dopaminergic system integrity (Qiang et al., 2013). We evaluated if PPMI PD subjects with higher ApoA1 levels have a more benign course of disease.

Methods

Plasma levels of EGF were measured by enzyme-linked immunosorbent assay (ELISA; R&D Systems, Minneapolis, MN, Catalog #DEG00) as previously described (Chen-Plotkin et al., 2011) according to manufacturer instructions. Samples were run in duplicate and data used for this study met quality control measures for technical performance (coefficient of variation (CV) < 0.20 for replicates). In our hands, this EGF ELISA can be expected to yield values that are robust across plates/days/operators. To minimize variability, however, all samples from each subject were processed on one lot of ELISAs, with minimal time between runs, which all occurred within 2 weeks. Operators were blinded to disease status during ELISA measurement. A quality-control reference sample (generated by pooling plasma from multiple samples into a large batch that was then aliquoted into many identical samples) was run in duplicate on each plate, to evaluate plate-to-plate variation, which was minimal (CV=0.07 across 39 separate measurements – one plate had only one reference sample).

Plasma levels of ApoA1 and a basic lipid panel (comprised of HDL, LDL, total cholesterol, and triglycerides) were measured using a Roche Cobas c501 automated biochemical analyzer (Tina-quant assay, catalog number 03032566-122). Samples were run in five batches, by the same operator, who was blinded to disease status. Two quality-control pooled plasma samples were run in duplicate per batch, to test for batch-to-batch variation, which was minimal (CV = 0.03 across 10 measurements).

Samples with CV>0.2 across duplicate spots are flagged as "high-CV" samples. These datapoints should be interpreted with caution. In addition, samples whose measures were lower than the lowest measurement on the standards used for each assay are flagged as "low-value" samples.

References

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