

Title: Prodromal Huntington's Disease Frontal Grey Matter

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Introduction

Huntington's Disease (HD) is an autosomal dominant, neurodegenerative illness. It is characterized by involuntary or abnormal movements, disorganization, and depression symptoms. A clinical diagnosis of HD requires that a patient exhibit severe motor and cognitive symptoms. However, cognitive, motor, and psychiatric decline have been detected in prodromal individuals. Our goal was to identify which brain regions are sensitive to specific clinical measures. We anticipated that changes in obsession would be negatively correlated with lobe specific grey matter volumes.

Methods

We used 490 prodromal cases taken from the PREDICT-HD data set. We tested 13 neuropsychiatric variables against 5 grey matter volumes; frontal, temporal, occipital, parietal, and total. For our statistical analyses, we performed a multiple hierarchical regression. In our first block, we included our demographic variables: age, intracranial volume, gender, and years of education. In our next block, we included all of the different scanning sites, as site differences can act as a confound. Our final block included the 13 clinical subscales ranging from obsession/compulsion, global severity, and more.

Results

We identified obsessive-compulsive tendencies and global severity index scores as positive and negative predictors of frontal lobe grey matter, respectively. Obsessive compulsive tendency scores positively predict frontal grey volumes, $\beta=.218$, $t= 2.377$, $p<.05$. Global severity index was a negative predictor of frontal grey matter, $\beta=-.869$, $t= -2.267$, $p<.05$. Overall, we accounted for 72.8% of the variability of frontal grey matter volumes with our model.

Discussion and Conclusion

Symptom severity and obsessive tendencies are more sensitive to changes in grey matter volume in individuals with prodromal HD. The negative relationship between symptom severity and grey matter loss is consistent with previous studies. Previous studies have identified the same positive relationship between obsessiveness and grey matter loss. The number of our predictors could have hindered our ability to find more significant relationships, and we suggest for future analyses that we use predictors for each model that correspond to with specific lobes identified in the literature.

Keywords: Prodromal Huntington's Disease, frontal grey matter, obsession, compulsion, global severity index