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The clinical, imaging and biological features of psychosis in Han Chinese patients with Huntington's disease

Xiao-Yan Li, MD,[1#] Bin Gao, MD,[1#] Juan-Juan Xie, MD, PhD,[1] Yu-Feng Bao,[1] Yi Dong, MD, PhD,[1, 2] Zhi-Ying Wu, MD, PhD[1, 3*]

[1]Department of Neurology and Research Center of Neurology in Second Affiliated Hospital, and Key Laboratory of Medical Neurobiology of Zhejiang Province, Zhejiang University School of Medicine, Hangzhou, China

[2]Department of Neurology, Huashan Hospital, Shanghai Medical College, Fudan University, Shanghai, China

[3]CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China

[#]Authors contributed equally to this work.

Background and purpose

Huntington's disease (HD) is an autosomal dominant neurodegenerative disease involving motor, cognitive and psychiatric disturbances. HD patients with psychosis symptoms usually have bad prognosis. Exploring clinical, imaging and biological features of psychosis in patients with HD is of importance.

Methods

A total of 118 Han Chinese patients with HD confirmed by Huntingtin genetic testing were recruited during 2013 to 2020. They were assessed by Unified Huntington's Disease Rating Scale (UHDRS) and followed up in an average of 34 months by telephone. Psychosis was determined by the presence of delusions or hallucinations using UHDRS-Problem Behavior Assessment. Data of magnetic resonance imaging (n=28) and serum neurofilament light chain (NfL, n=28) were collected in some patients.

Results

Among 118 patients (mean age 46.0 years, SD 12.0; female 53.5%), the frequency of psychosis was 14.4% (n=17) in the cross-sectional analysis and 17.8% (n=21) in the longitudinal observation. Probands with psychosis were predominantly female (82.3%). They exhibited worse motor, cognitive, behavioral and functional performances compared with patients without psychosis. Furthermore, the lateral ventricles volume was larger in patients with psychosis compared with patients without psychosis (p=0.0013) while there was no difference in NfL levels between two groups. NfL levels of patients with psychosis were negatively correlated with caudate volumes (r=-0.54, p=0.044) and white matter volumes (r=-0.57, p=0.035).

Conclusions

In summary, HD patients with psychosis had distinct clinical, imaging and biological features. These features might help clinicians to identify psychosis in HD patients early and provide protective interventions before adverse outcomes occur.

Reference

Connors, M.H., Teixeira-Pinto, A., Loy, C.T., 2020. Psychosis and longitudinal outcomes in Huntington disease: the COHORT Study. Journal of neurology, neurosurgery, and psychiatry 91(1), 15-20.

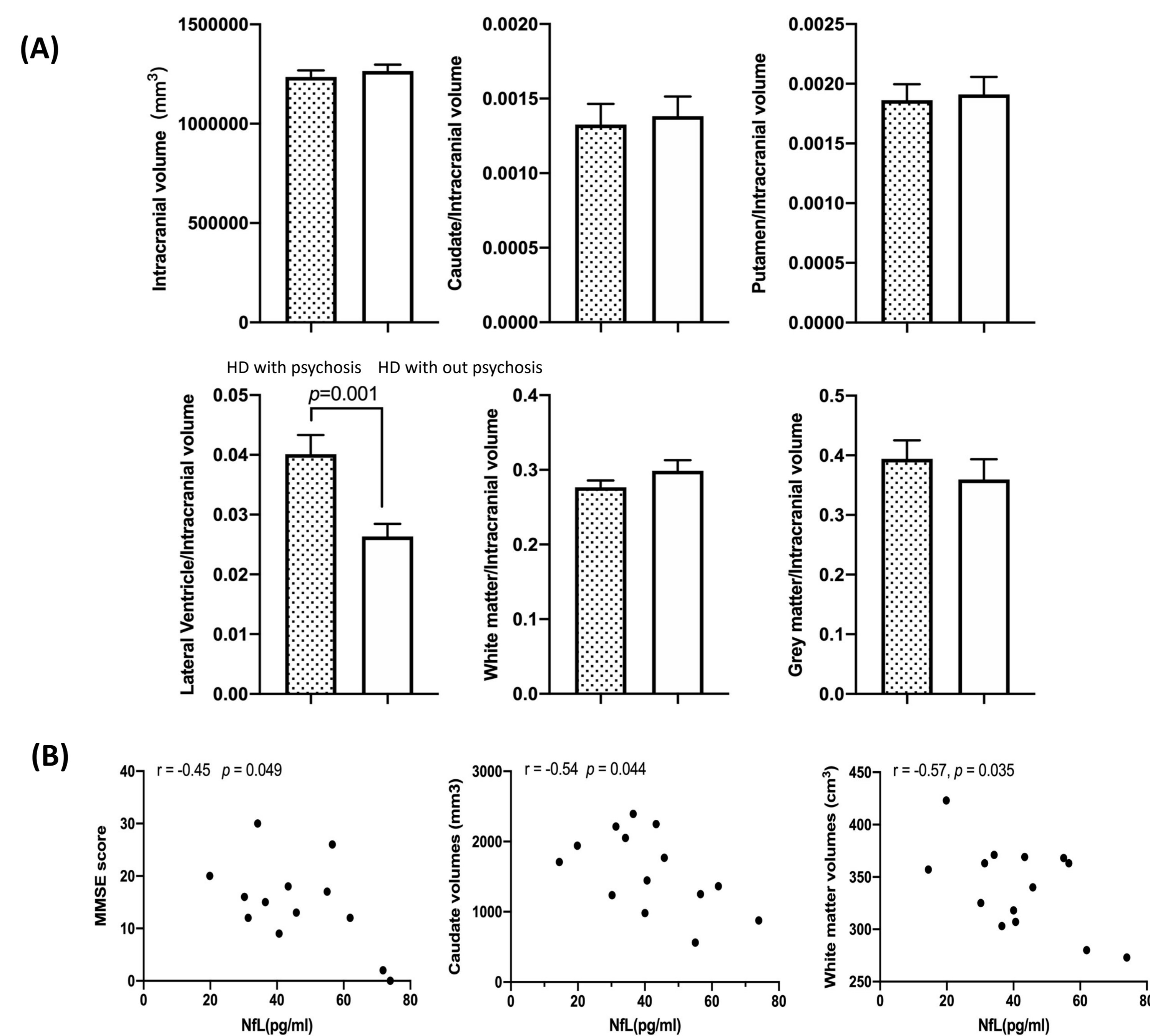### Figure 1 . The imaging and biological features of HD patients with psychosis.

Figure 2. T1-weighted magnetic resonance imaging (MRI) images of typical HD patients with psychosis.

(A-B) A 56-year-old woman with HD, was longitudinally followed up and underwent 1.5T MRI scanning in 2017 and 2020, respectively. In 2017 she didn't show any psychotic symptoms while in 2020 she had serious delusion and hallucination. The MRI images showed the enlargement of lateral ventricle and atrophy of temporal lobe. (C) A 56-year-old woman, diagnosed both as HD and schizophrenia, had 4-year disease duration. Her lateral ventricle was asymmetrically enlarged. (D-F) The 7T MRI images of a 40 years old woman with 9 years of disease duration. She developed serious and refractory psychosis after having a high fever. The lateral ventricle was enlarged accompanied by severe cerebral atrophy including caudate, putamen, parieto-temporal lobe and hippocampus.
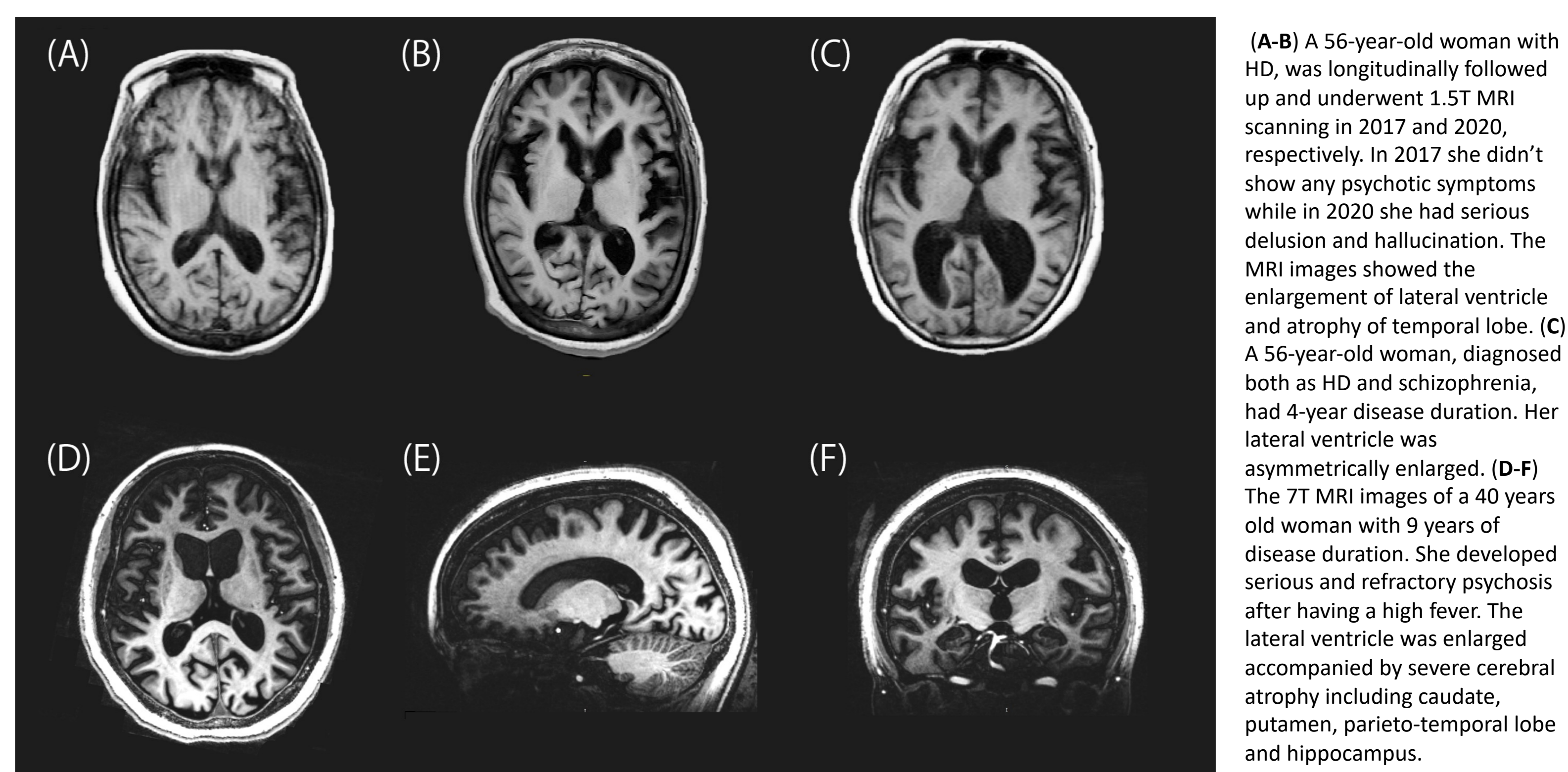
Figure 3. Relationships between CAG repeat length and age at onset of motor symptoms or psychosis in 17 HD patients with psychosis.