INTRODUCTION

• HIV-infected individuals were exposed to high risk for developing significant neurological and neuropsychological dysfunction prior to the use of combination antiretroviral therapy (cART).
• The risk of severe cognitive impairment has declined since the first use of cART, while the rate of milder forms of impairment has remained relatively unaffected.
• It is not clear how cognitive functions in HIV-infected individuals changed after beginning cART from existing data and the extent to which impairment prior to cART is associated with subsequent cognitive functions.
• The goal of this project was to figure out how cognitive functions will change in HIV-infected individuals after the use of cART.

METHODS

Study Population
• This project used data prior to October, 2017 from Multicenter AIDS Cohort study (MACS). Only individuals with all neuropsychological (NP) domain scores available and naïve to cART are included in the analysis, which consists of 537 HIV-infected and 1667 uninfected individuals initially.

Cognitive Impairment Classification
• Cognitive impairment is classified based on the multivariate normative comparison (MNC) method, which computes a single measure of distance between an individual participant’s domain scores and the “normative” mean of the seronegative subjects (reference group) across all domains.
• Six NP domains include motor speed and coordination, executive functioning, memory, working memory and attention, learning and speed of information processing.
• MNC takes intercorrelation of cognitive functions into account to control false discovery rate.
• Reference group contains uninfected individuals with six NP domain scores available.
• Individuals are coded as having prior impairment if they have any cognitive abnormalities at any visit prior to time 0. Time 0 is defined as the beginning of cART for HIV-infected individuals.
• 90 out of 537 HIV-infected individuals were classified to having prior impairment.

Matching
• HIV-infected individuals were manually matched with uninfected individuals based on race and prior impairment status.
• For uninfected individual candidates, time 0 was defined as the date of MACS visit closest to time 0 of matched HIV-infected individual.

RESULTS

Matching
• Matching was then based on propensity score, which was computed with age at time 0, depression symptoms at time 0, education level, cognitive functions at time 0 and cohort.

Trajectories
• LOWESS curves of each NP domain score for each group of individuals were plotted along with 95% bootstrap confidence interval from 5 years prior to time 0 to 15 years after time 0.

RESULTS (con’t)

Matching Result
• 506 matched pairs were utilized after matching, which consists of 83 pairs with prior impairment and 423 pairs without prior impairment.
• By propensity score matching, the matched pairs were comparable with small effect size and large P-value with respect to age, depression scales, cognitive functions at time 0, race, education and cohort.

Comparison between Impaired and Unimpaired Group
• Impaired individuals tend to be older, more depressed and have lower cognitive functioning.

Trajectories Comparison
• No significant differences were observed between HIV-infected and uninfected individuals with same impairment status in trajectories regarding executive functioning, speed of information processing, learning, memory and working memory and attention.
• Faster decline in motor speed and coordination was found for HIV-infected individuals approximately 8 years after using cART, especially for the group without prior impairment.
• Overall, individuals without prior impairment have higher scores for all six NP domains compared with individuals with prior impairment.
• No significant improvement was found in cognitive functions of HIV-infected men with prior impairment after the beginning of treatment.

CONCLUSIONS

• Matching HIV-infected individuals with uninfected men with same prior impairment status facilitates the evaluation of relative cognitive function declines among HIV-infected men after using cART.
• Trajectories suggest no significant improvement or decline in cognitive functions of HIV-infected individuals with prior impairment and that prior impairment will have a lasting effect on cognition over follow-up.

REFERENCES