MONITORING THE PROGRESSION OF ALZHEIMER'S DISEASE WITH LATENT TRANSITION MODELS

BACKGROUND AND PURPOSE: Alzheimer's disease is currently a neurodegenerative diseases without any effective treatments to slow or reverse the progression. To develop any potential treatments, the need of a good statistical model to assess the progression of Alzheimer's disease is becoming increasingly urgent. This study proposed a latent transition model to monitor the progression of Alzheimer's disease which can help the development of a given proposed treatment.

METHOD: A latent transition model was used to assess the progression of Alzheimer's disease. The volume of Hippocampus and fluorodeoxyglucose –PET (FDG) were employed as biomarkers in this model. These two biomarkers are very sensitive to the pathological signs of the Alzheimer's disease. The proposed latent transition model was performed with real data from Alzheimer's disease Neuroimaging Initiative (ADNI), which contain 2,126 participants from 2005 to 2014.

RESULTS/FINDINGS: The latent transition model suggested six states of disease progression and two different pathological profiles. One progression profile was mainly determined by the biomarker of FDG and the other by the volume of Hippocampus.

CONCLUSION: The results revealed the existence of various progression profiles of Alzheimer's disease, suggesting a new way to evaluate the disease progression.