Background: Among other emerging amyloid-targeting blood-based biomarkers, Multimer Detection System-Oligomeric Amyloid-β (MDS-OAβ) measures dynamic changes in concentration of oligomeric amyloid-β (OAβ), which is considered the main pathogenic culprit of Alzheimer’s disease (AD), in plasma after spiking with synthetic amyloid-β (Aβ). We aimed to investigate predictability of MDS-OAβ on amyloid Positron Emission Tomography (PET) positivity.

Method: A total of 96 subjects who visited Seoul National University Bundang Hospital for medical check-up complaining of cognitive decline and had undergone extensive medical assessment were recruited. Amyloid statuses were dichotomized into positive or negative based on visual assessment of amyloid PET. Plasma OAβ concentration was measured by MDS-OAβ. In the previous validation study, 0.78ng/ml was established as the cut-off value and the plasma OAβ concentration higher than or equal to the cut-off value was defined MDS-OAβ positive.

Result: MDS-OAβ positivity could discriminate amyloid PET positivity with the AUC value of 0.855 (95% CI 0.776–0.933). Adding MDS-OAβ positivity to prediction models including age, MMSE score, and APOE ε4 status improved the performance up to the AUC value of 0.926 (95% CI 0.871–0.980).

Conclusion: The Aβ oligomerization tendency in plasma could predict amyloid PET positivity with high performance, and when it is combined with age, MMSE score, and APOE ε4 status, the predictability was improved substantially. This suggests the potential of MDS-OAβ as a useful initial stage test in clinical and research field of AD.