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BIOMARKERS

POSTER PRESENTATION

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NEUROIMAGING

[18F] RO948 Tau PET imaging and plasma biomarkers in PART and LATE patients compared with sporadic Alzheimer's Disease

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Abstract

Background: Although the diagnosis of Alzheimer´s disease (AD) dominates in the tertiary memory clinic setting, there are also patients which show no sign for presence of amyloid in brain when assessed for CSF biomarkers after lumbar puncture (LP) or amyloid PET. Since these amyloid negative (A-) patients can clinically mimic symptomatic AD patients, it is important to obtain further insight into the in vivo pathology of these patients. This study therefore aimed to perform tau PET imaging with the tracer [18F]RO948 and measure plasma biomarkers in patients clinically diagnosed as primary age-related tauopathy (PART) and limbic dominant TDP-43 age-related encephalopathy (LATE) at the clinic for cognitive disorders at Karolinska University Hospital.

Method: Four patients diagnosed with **PART** (mean age 76 years) and four with **LATE** (mean age 79 years) were included in the study. Clinical characteristics and biomarkers are reported in Table 1. The ATN classification for PART patients was A-T+N+ and for LATE patients A-T-N+. On the same day, all participants underwent [18F]RO948 tau PET and MRI scans, and blood sampling for plasma biomarker analysis using the NuLISAseq (Alamarbio) CNS panel. The obtained data was compared with 27 amyloid positive MCI and AD patients from Karolinska as well as 10 cognitive healthy controls.

Result: Low uptake of [18F]RO948 was observed in PART and LATE brains compared to MCI A+ as shown in Figure 1, including also Radar plots of different brain regions. Box plot data (Figure 2) showed low [18F]RO948 regional uptake except for a higher uptake (p <0.05) in the putamen in PART and LATE compared to controls. Higher plasma levels of ptau217, ptau181, ptau231 were observed in PART patients (p <0.05)

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but not in LATE compared to cognitively healthy controls. Plasma ptau217 levels were however higher in LOAD (p <0.05) compared to PART. Higher plasma Aß42 values were observed both in LATE and PART compared to LOAD.

Conclusion: PART and LATE patients exhibit Tau PET uptake similar to that of controls, except in the putamen. Additionally, PART patients show elevated plasma levels of *p*-tau 217, *p*-tau 181, and *p*-tau 231, whereas LATE patients do not.

Table 1

Marker	PART (n=4)	LATE (n=4)
ApoE	3/3 (n=3), 3/4 (n=1)	3/3 (n=4)
CSF biomarkers	Aß42/40 ratio, normal range pTau181 (mean 64; cut-off<56.6) total Tau (mean 498; cut off < 404)' NFL (mean 2330; cut off <1850)	Aß42/40 ratio, normal range pTau181, normal range total Tau, normal range NFL (mean 1980), n=3 elevated
MTA (MRI)	1-3 (n=4)	2-4 (n=3), 1 (n=1)
Cognition	MMSE (mean 29/30), NP testing indicated MCI	MMSE (mean 27/30), NP testing indicated MCI

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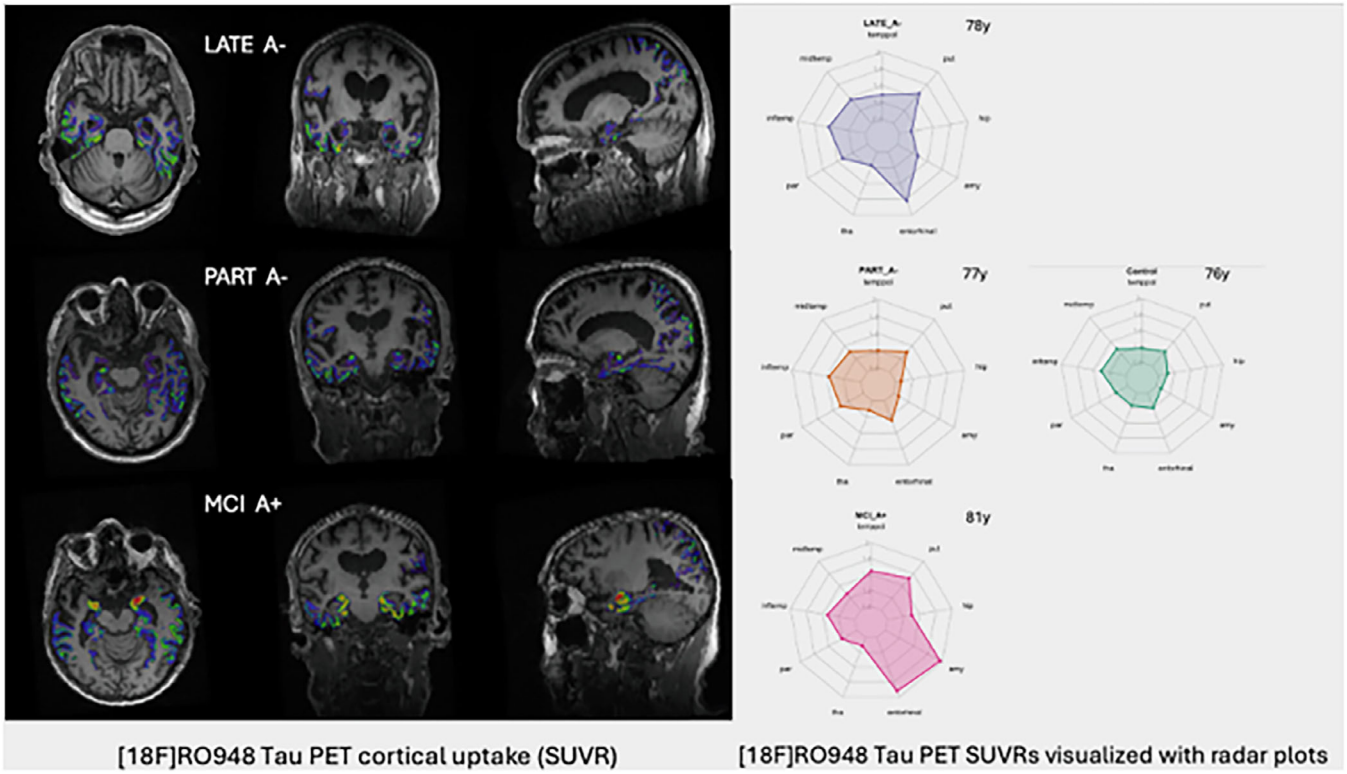

[18F]RO948 Tau PET cortical uptake (SUVR)

[18F]RO948 Tau PET SUVRs visualized with radar plots