

SUPPLEMENTARY TABLES

Supplementary Table 1. Participant demographic and clinical information of CSF , AV45 PET imaging and MRI measurements analyses.

Participant features	CSF biomarkers analyses			AV45 PET imaging analyses			MRI measurements analyses		
	Normal PP	High PP	P Value	Normal PP	High PP	P Value	Normal PP	High PP	P Value
N	517	460		381	358		583	554	
Age(Mean ± SD, year)	71.79±6.895	74.18±6.98	<0.0001	70.67±6.595	73.63±7.072	<0.0001	71.92±6.632	74.3±6.776	<0.0001
Gender (M/F)	287/230	250/210	0.715	201/179	180/178	0.457	325/258	296/258	0.433
Education (Mean ± SD, year)	16.2±2.723	16.17±2.679	0.757	16.5±2.545	16.22±2.662	0.164	16.21±2.798	15.92±2.837	0.068
APOE ε4 carrier status (2/1/0)	301/174/42	273/156/31	0.711	220/131/30	215/119/24	0.746	331/201/51	328/190/36	0.338
BMI (Mean ± SD, kg/m ²)	27.22±4.95	27.16±4.751	0.827	27.84±5.175	27.74±5.168	0.636	27.08±4.732	27.06±4.82	0.697
CVD(yes/no)	103/416	89/371	0.845	50/331	55/303	0.384	129/454	124/430	0.918
Hyperlipemia (yes/no)	246/271	226/214	0.243	190/191	177/181	0.908	272/311	262/292	0.830
Hypertension (yes/no)	211/306	233/227	0.002	156/225	183/175	0.006	245/338	281/273	0.003
T2DM (yes/no)	31/486	38/402	0.116	27/354	34/324	0.234	40/543	47/507	0.304
Cognitive diagnoses									
CN/MCI	192/326	173/287	0.830	140/241	140/218	0.509	223/360	220/334	0.614

Abbreviations: Normal PP=normal pulse pressure; High PP=high pulse pressure; CSF, cerebrospinal fluid; SD=standard deviation; APOE, *apolipoprotein epsilon*; BMI ,Body Mass Index; CVD, Cardiovascular Disease; T2DM, Type 2 diabetes mellitus; CN ,cognitively normal; MCI, mild cognitive impairment.

Supplementary Table 2. Association between PP and CSF biomarkers and AV45 PET imaging in cross-sectional and longitudinal analyses.

Variables	Total		cognitive diagnostic strata				Age subgroups			
	β	P Value	CN		MCI		Young old group		Very old group	
			β	P Value	β	P Value	β	P Value	β	P Value
Cross-sectional outcomes										
Aβ ₄₂	-0.525	0.015	-0.477	0.923	-0.068	0.002	-0.483	0.084	-0.063	0.019
T-tau	0.077	0.011	0.064	0.154	0.104	0.009	0.035	0.084	0.102	0.031
P-tau	0.097	0.003	0.112	0.026	0.099	0.018	0.078	0.062	0.111	0.024
T-tau/ Aβ ₄₂	0.131	0.004	0.094	0.309	0.155	0.002	0.141	0.041	0.156	0.009
P-tau/Aβ ₄₂	0.157	0.001	0.230	0.047	0.159	0.004	0.142	0.065	0.201	0.002
Summary	0.018	0.011	-2.888*e ⁻⁴	0.974	0.034	0.003	0.027	<0.001	0.025	0.211
SUVR										
Longitudinal outcomes										
Aβ ₄₂	0.079	0.919	0.075	0.960	-0.035	0.965	1.458	0.161	-1.650	0.138
T-tau	-1.032	0.183	-0.279	0.750	-1.485	0.191	-1.477	0.140	-0.028	0.980
P-tau	0.201	0.759	1.617	0.096	-0.833	0.365	-1.061	0.241	1.669	0.134
T-tau/ Aβ ₄₂	-0.010	0.123	-4.239*e ⁻³	0.468	-0.015	0.119	-0.020	0.019	0.004	0.707
P-tau/Aβ ₄₂	-7.114*e ⁻⁴	0.889	9.941*e ⁻³	0.123	-8.105*e ⁻³	0.273	-0.012	0.090	0.013	0.104
Summary	1.457*e ⁻³	0.144	3.277*e ⁻⁴	0.840	2.293*e ⁻³	0.069	1.525*e ⁻³	0.221	1.033*e ⁻⁴	0.953
SUVR										

Abbreviations: PP, pulse pressure; CSF, cerebrospinal fluid; CN ,cognitively normal; MCI, mild cognitive impairment; Young old group, <75 years old; Very old group, ≥75 years old; Aβ₄₂, β-amyloid 42; T-tau ,total tau; P-tau, phosphorylated tau.

Supplementary Table 3. Association between PP and brain aging biomarkers in cross-sectional and longitudinal analyses.

Variables	Total		cognitive diagnostic strata				Age subgroups			
			CN		MCI		Young old group		Very old group	
	β	P Value	β	P Value	β	P Value	β	P Value	β	P Value
Cross-sectional outcomes										
Hippocampal Volume	-1.084*e ³	0.312	-1.242*e ¹	0.863	-8.861*e ¹	0.222	-1.114*e ⁴	0.251	-8.833*e ¹	0.279
Entorhinal Volume	-2.311*e ¹	0.554	-1.053*e ¹	0.848	-3.245*e ¹	0.545	-1.522*e ¹	0.750	-3.575*e ¹	0.592
Mid-temporal Volume	4.364*e ¹	0.752	1.030*e ²	0.606	2.378*e ¹	0.900	1.085*e ²	0.558	-9.282*e ¹	0.663
ADNI-MEM	-0.030	0.343	-0.016	0.729	-0.031	0.467	-0.092	0.036	0.036	0.437
ADNI-EF	-0.042	0.298	-0.074	0.235	-0.015	0.777	-0.090	0.103	-0.005	0.940
Longitudinal outcomes										
Hippocampal Volume	-16.903	0.039	-12.534	0.222	-18.935	0.094	-11.173	0.307	-19.181	0.121
Entorhinal Volume	-20.014	0.031	-2.800	0.837	-32.776	0.007	-23.673	0.046	-12.120	0.426
Mid-temporal Volume	-23.890	0.382	-39.120	0.167	-16.890	0.664	-54.620	0.128	17.348	0.683
ADNI-MEM	-1.829*e ⁻²	0.058	0.001	0.896	-0.034	0.012	-0.016	0.214	-0.009	0.526
ADNI-EF	1.395*e ⁻⁴	0.991	4.115*e ⁻⁵	0.998	-6.049*e ⁻⁴	0.972	-0.001	0.937	0.013	0.409

Abbreviations: PP, pulse pressure; CN, cognitively normal; MCI, mild cognitive impairment; Young old group, <75 years old; Very old group, ≥75 years old.

Supplementary Table 4. Association between SBP and AD biomarkers and brain aging in cross-sectional analyses.

Variables	Total		cognitive diagnostic strata				Age subgroups			
			CN		MCI		Young old group		Very old group	
	β	P Value	β	P Value	β	P Value	β	P Value	β	P Value
A β ₄₂	-0.373	0.014	-5.575	0.113	-0.027	0.065	-0.164	0.417	-0.061	<0.001
T-tau	0.047	0.026	0.024	0.464	0.073	0.008	0.006	0.685	0.106	0.001
P-tau	0.060	0.007	0.077	0.032	0.060	0.037	0.050	0.097	0.082	0.014
T-tau/ A β ₄₂	0.084	0.008	0.063	0.341	0.098	0.006	0.044	0.370	0.148	<0.001
P-tau/A β ₄₂	0.106	0.002	0.223	0.007	0.081	0.034	0.078	0.160	0.151	<0.001
Summary SUVR	0.011	0.037	0.003	0.596	0.016	0.041	0.015	0.003	0.012	0.362
Hippocampal Volume	-3.019*e ⁻²	0.690	4.465*e ¹	0.392	-6.319*e ¹	0.209	-1.711*e ³	0.809	-2.560*e ¹	0.642
Entorhinal Volume	-3.313*e ¹	0.228	-2.351*e ¹	0.556	-3.582*e ¹	0.334	-4.856*e ¹	0.162	-1.369*e ¹	0.761
Mid-temporal Volume	-1.837*e ⁻²	0.059	6.416*e ¹	0.658	-3.200*e ²	0.014	-2.062*e ⁻²	0.127	-1.379*e ²	0.337
ADNI-MEM	-0.036	0.108	-0.029	0.386	-0.040	0.175	-0.064	0.042	-4.794*e ⁻⁴	0.988
ADNI-EF	-0.055	0.053	-0.036	0.424	-0.063	0.079	-0.080	0.046	-0.035	0.396

Abbreviations: SBP, systolic blood pressure; CN ,cognitively normal; MCI, mild cognitive impairment; Young old group, <75 years old; Very old group, ≥75 years old; A β ₄₂, β -amyloid 42; T-tau ,total tau; P-tau, phosphorylated tau.

Supplementary Table 5. Association between DBP and AD biomarkers and brain aging in cross-sectional analyses.

Variables	Total		cognitive diagnostic strata				Age subgroups			
			CN		MCI		Young old group		Very old group	
	β	P Value	β	P Value	β	P Value	β	P Value	β	P Value
A β ₄₂	0.018	0.923	-3.756	0.394	0.017	0.346	0.217	0.369	-0.019	0.426
T-tau	-0.016	0.537	0.055	0.174	-0.063	0.063	-0.016	0.361	-0.021	0.609
P-tau	-0.033	0.232	-0.009	0.832	-0.036	0.307	-0.039	0.279	-0.014	0.755
T-tau/ A β ₄₂	-0.017	0.662	0.126	0.136	-0.068	0.114	-0.059	0.316	-0.002	0.969
P-tau/A β ₄₂	-0.033	0.437	0.027	0.793	-0.048	0.300	-0.070	0.291	-0.005	0.933
Summary SUVR	-0.005	0.460	0.006	0.425	-0.001	0.246	-0.005	0.425	0.003	0.835
Hippocampal Volume	1.447*e ³	0.109	-7.129*e ¹	0.247	-6.045*e ¹	0.316	3.431*e ²	0.967	-5.790*e ¹	0.396
Entorhinal Volume	-3.808*e ¹	0.246	-5.520*e ¹	0.242	-1.974*e ¹	0.657	-1.814	0.964	-6.853*e ¹	0.219
Mid-temporal Volume	-3.337*e ²	0.004	-3.049*e ²	0.074	-3.178*e ²	0.042	-2.807*e ²	0.072	-2.895*e ²	0.104
ADNI-MEM	-0.055	0.044	-0.067	0.091	-0.040	0.277	-0.015	0.698	-0.084	0.034
ADNI-EF	-0.055	0.117	0.026	0.625	-0.099	0.028	-0.024	0.621	-0.075	0.145

Abbreviations: DBP, diastolic blood pressure; CN ,cognitively normal; MCI, mild cognitive impairment; Young old group, <75 years old; Very old group, ≥75 years old; A β ₄₂, β -amyloid 42; T-tau ,total tau; P-tau, phosphorylated tau.

Supplementary Table 6. Association between Hypertension and AD biomarkers and brain aging in cross-sectional analyses.

Variables	Total		cognitive diagnostic strata				Age subgroups			
			CN		MCI		Young old group		Very old group	
	β	P Value	β	P Value	β	P Value	β	P Value	β	P Value
A β ₄₂	-1.916	0.529	3.783	0.456	-0.023	0.301	-0.320	0.273	-0.011	0.687
T-tau	-3.578	0.169	-0.054	0.239	-0.012	0.764	-0.026	0.217	0.007	0.889
P-tau	-1.104	0.359	-0.023	0.652	-0.012	0.782	-	-	-	-
T-tau/ A β ₄₂	-0.032	0.498	-0.109	0.255	0.013	0.801	-0.029	0.682	0.017	0.778
P-tau/A β ₄₂	-0.009	0.857	-0.079	0.512	0.020	0.727	0.040	0.615	-0.021	0.751
Summary SUVR	-0.005	0.531	-0.006	0.538	-0.002	0.841	0.008	0.290	-0.023	0.277
Hippocampal Volume	-5.023*e ³	0.186	-8.436*e ¹	0.313	-7.653*e ¹	0.400	-2.357*e ²	0.008	2.108*e ⁵	0.753
Entorhinal Volume	-5.063*e ¹	0.269	-8.490*e ¹	0.182	-1.631*e ¹	0.799	-1.221*e ²	0.033	2.820*e ¹	0.714
Mid-temporal Volume	-2.049*e ²	0.213	-9.223*e ¹	0.698	-2.500*e ²	0.264	-5.001*e ²	0.021	1.158*e ²	0.658
ADNI-MEM	-0.063	0.103	-0.063	0.247	-0.069	0.190	-0.125	0.018	-0.032	0.570
ADNI-EF	-0.163	0.001	-0.122	0.112	-0.182	0.005	-0.245	<0.001	-0.159	0.031

Abbreviations: CN ,cognitively normal; MCI, mild cognitive impairment; Young old group, <75 years old; Very old group, ≥75 years old; A β ₄₂, β -amyloid 42; T-tau ,total tau; P-tau, phosphorylated tau.