**Supplementary Table S1.** MRI scanning protocol in different MRI scanners.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scanner | Axial T1WI | Axial T2WI | Axial T2 FLAIR | Axial DWI |
| GE MEDICAL SYSTEMS Discovery MR 750w 3.0T | TR=2000 msTE=24.96 msFOV=240 mmmatrix=224×320ST=6 mm | TR=4356 msTE=103 msFOV=240 mmmatrix=416×416ST=6 mm | TR=6500 msTE=103 msFOV=240 mmmatrix=256×256ST=6 mm | TR=3641 msTE=78 msFOV=240 mmmatrix=130×169ST=6 mm |
| GE MEDICAL SYSTEMS Signa HDxt 3.0T | TR=2136 msTE=22 msFOV=240 mmmatrix=224×320ST=6 mm | TR=4000 msTE=94 msFOV=240 mmmatrix=384×384ST=6 mm | TR=8000 msTE=168 msFOV=240 mmmatrix=224×288ST=6 mm | TR=5000 msTE=74 msFOV=240 mmmatrix=160×160ST=6 mm |
| Philips MEDICAL SYSTEMS Ingenia 3.0T | TR=2000 msTE=20 msFOV=230 mmmatrix=196×168ST=6 mm | TR=2123 msTE=80 msFOV=230 mmmatrix=266×320ST=6 mm | TR=9000 msTE=110 msFOV=230 mmmatrix=193×208ST=6 mm | TR=2773 msTE=103 msFOV=230 mmmatrix=122×152ST=6 mm |
| Philips Medical systems Achieva 1.5T | TR=2000 msTE=24 msFOV=230 mmmatrix=205×256ST=6 mm | TR=4280 msTE=120 msFOV=230 mmmatrix=235×288ST=6 mm | TR=6000 msTE=120 msFOV=230 mmmatrix=198×256ST=6 mm | TR=2706 msTE=94 msFOV=230 mmmatrix=129×144ST=6 mm |
| TOSHIBA-MEC 1.5T | TR=2150 msTE=15 msFOV=240 mmmatrix=224×272ST=6 mm | TR=3200 msTE=90 msFOV=240 mmmatrix=224×320ST=6 mm | TR=8000 msTE=100 msFOV=240 mmmatrix=192×320ST=6 mm | TR=4000 msTE=100 msFOV=240 mmmatrix=120×122ST=6 mm |

TE, echo time; TR, repetition time; FOV, field of view; ST, slice thickness.

**Supplementary Table S2.** Summary of brain atrophy 43.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Normal=0 | Mild=1 | Moderate=2 | Severe=3 |
| Central atrophy (LVBI) | >4 | 3.6-4 | 3-3.5 | <3 |
| Cortical atrophy (sulci width) |  | 3-5 | >5 | >6 |

**Supplementary Table S3.** TheICC of linear indicators for central brain atrophy

|  |  |  |
| --- | --- | --- |
| Variables | ICC | P value |
| a | 1 | **<0.001** |
| b | 0.996 | **<0.001** |

a: minimum distance of lateral wall of bilateral lateral ventricle; b: brain transverse diameter at the same level; ICC: interclass correlation coefficient; bold means P < 0.05.

**Supplementary Table S4.** Results of ROC analysis for multiple indicators combined diagnosis in different group.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Group Variables | Cut off | AUC | 95%CI | SE (%) | SP (%) |
| PVWMH, LVBI, and cortical atrophy（mode 1） | 0.342 | 0.782 | 0.716-0.840 | 68.5 | 78.5 |
| PVWMH and LVBI(mode 2) | 0.341 | 0.734 | 0.640-0.815 | 71.0 | 77.6 |
| PVWMH, LVBI, and cortical atrophy(mode 3) | 0.259 | 0.757 | 0.674-0.828 | 83.8 | 65.6 |
| PVWMH and LVBI(mode 4) | 0.360 | 0.720 | 0.618-0.808 | 69.0 | 76.9 |

mode 1: CN vs cognitive impairment; mode 2: Aβ- subgroup; mode3: tau- subgroup; mode 4: Aβ-tau- subgroup; AUC: area under ROC curve; 95%CI: 95% Confidence interval; SE: sensitivity; SP: specificity.

**Figure Legends**

**Supplementary Figure S1.** Representations of grades 0, 1, 2, and 3 for DWMH and PVWMH.