

## XII. Head MRI Measurements

MRI was performed on a 1.5T Toshiba instrument (VISART). The scanning protocol included a series of axial T1-(TR500, TE15) and T2-weighted(TR4000, TE120) scans angled parallel to the anterior-posterior commissure line.

### 1. Findings and diagnosis

#### 1) Periventricular hyperintensity

Divided into 4 classes according to Appendix1.

#### 2) Ventricular dilatation

Divided into 4 classes according to Appendix2.

#### 3) Brain atrophy

Divide into 4 classes according to Appendix3.

#### 4) Cerebrovascular disease

##### Cerebral infarction

Border zone

Include cerebral cortex

White matter

Basal ganglia, thalamus, internal capsule, midbrain, pons, medulla oblongata

Cerebellar white matter, cerebellar cortex

Decided as following,

Lacuna infarction: The lesions of white matter, basal ganglia, thalamus, internal capsule, midbrain, pons, medulla oblongata and whose size are larger than or equal to 3mm and smaller than or equal to 15mm.

Cerebral embolism : Include cerebral or cerebellar cortex, and which is not border zone infarction.

Cerebral thrombosis : Other than above.

##### Cerebral hemorrhage

On T2 weighted image(WI), hyperintensity inside the lesion and no signal around the lesion. Or on T2WI no signal slit lesion.

##### Cerebrovascular diseases

Cerebrovascular diseases were defined as all of cerebral infarction and cerebral hemorrhage.

### 2. Measurements

Total area of brain parenchyma (cm<sup>2</sup>)

Whole brain volume (cm<sup>3</sup>)

Area of vermis in midsagittal slice (cm<sup>2</sup>)

Area of ventral pons in midsagittal slice (cm<sup>2</sup>)

Area of corpus callosum in midsagittal slice (cm<sup>2</sup>)

Cross-sectional area of skull in midsagittal slice (cm<sup>2</sup>)

Area of lateral ventricle (cm<sup>2</sup>)

Area of brain parenchyma (cm<sup>2</sup>)

Area of subarachnoid CSF (forward from the tip of lateral ventricle)(cm<sup>2</sup>)

Area of subarachnoid CSF (subarachnoid CSF from anterior horn to posterior horn)(cm<sup>2</sup>)

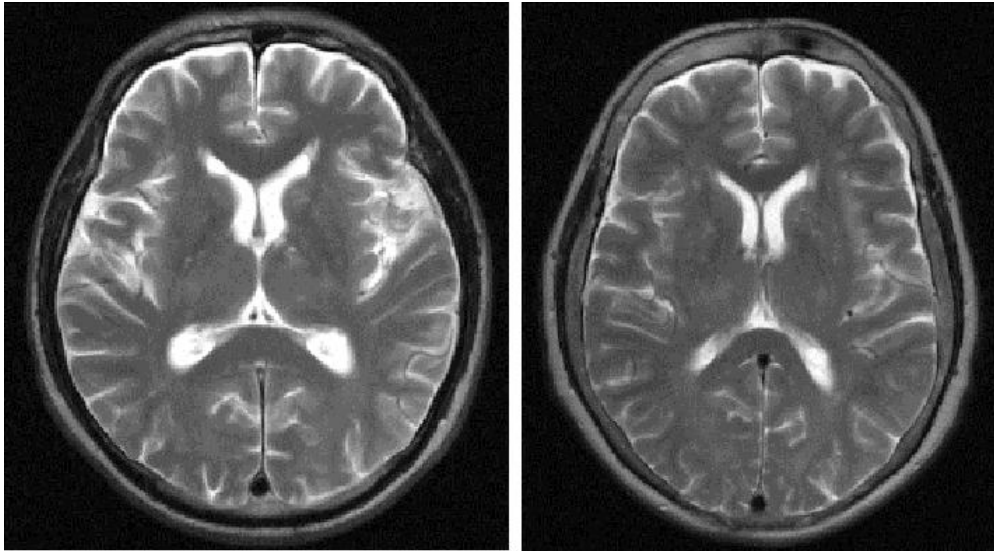
## References

Stroke 1994 vol25, p318-327  
Naika 1997 vol79 (4)  
Nihon naika gakkaiishi 1997 vol86  
Medicina 1994 vol31 (8)

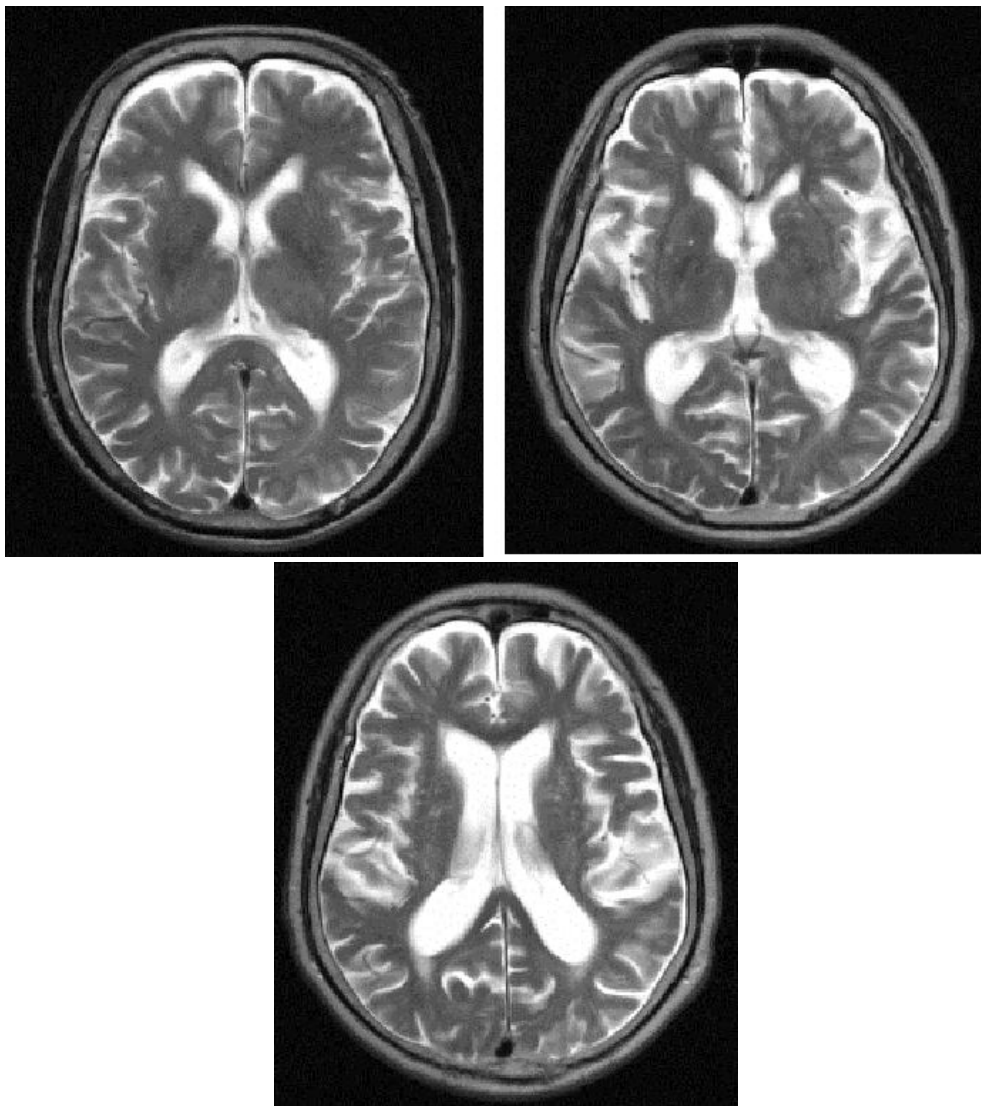
---

### Appendix 1 : Periventricular hyperintensity

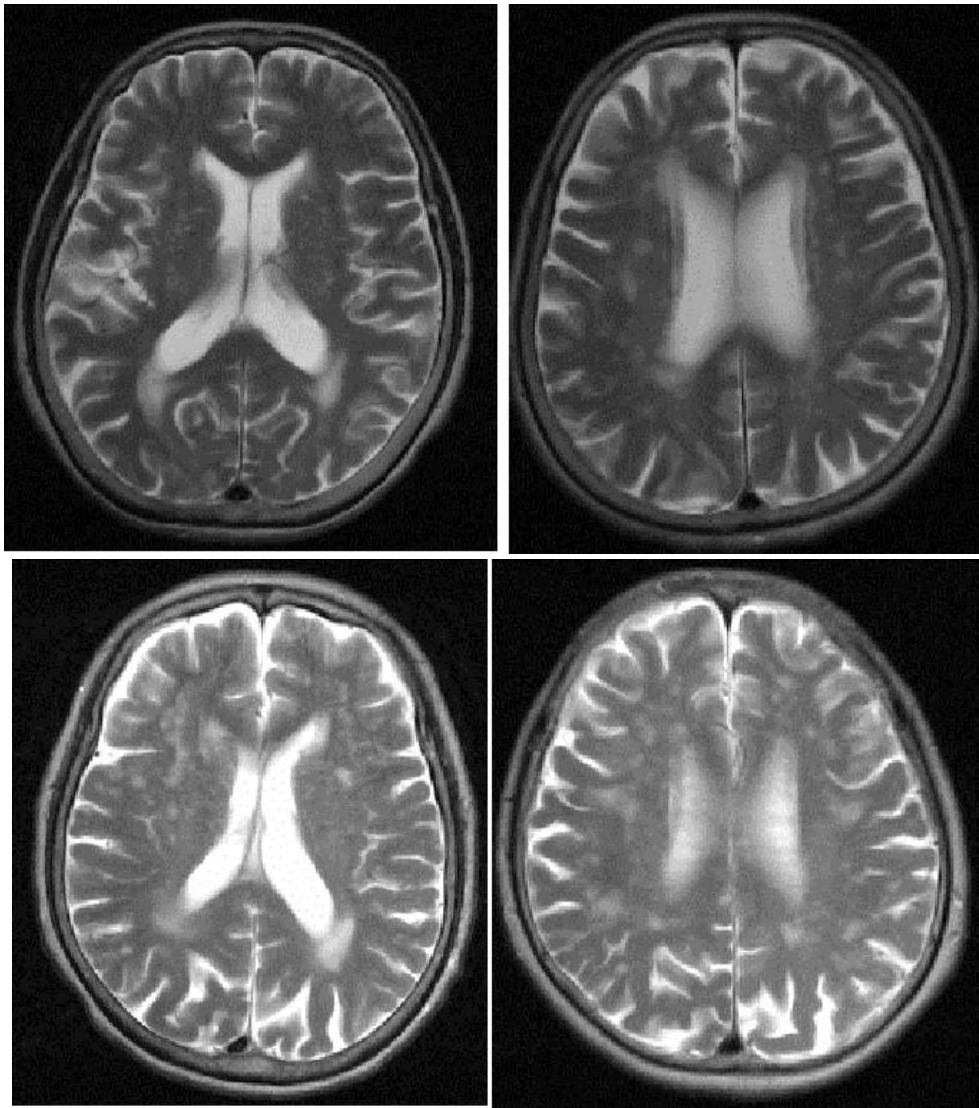
I. None : None or minimal periventricular signal hyperintensities in the form of caps only in the anterior horn of lateral ventricles.



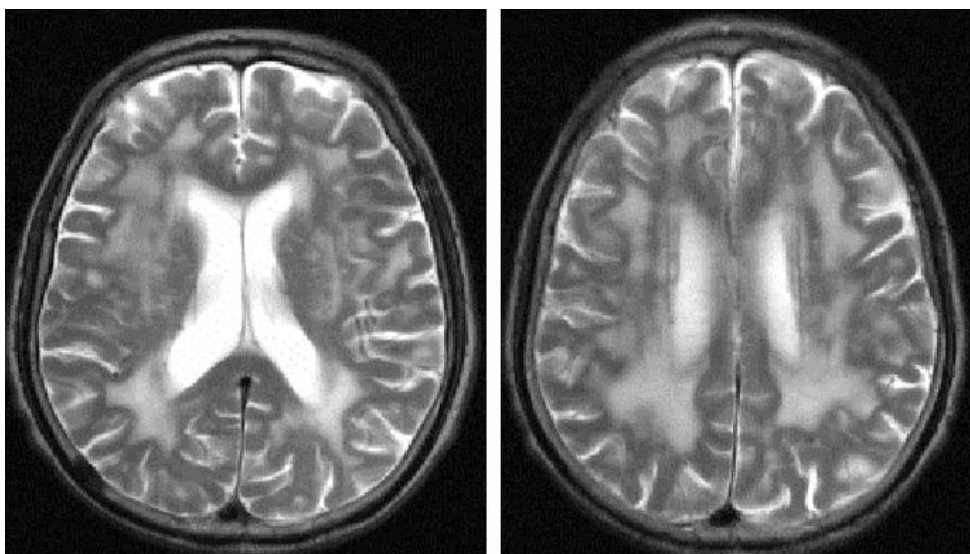
II. Mild : Caps in both anterior and posterior horns of lateral ventricles.



III. Moderate : Multifocal periventricular hyperintense punctuate lesions.

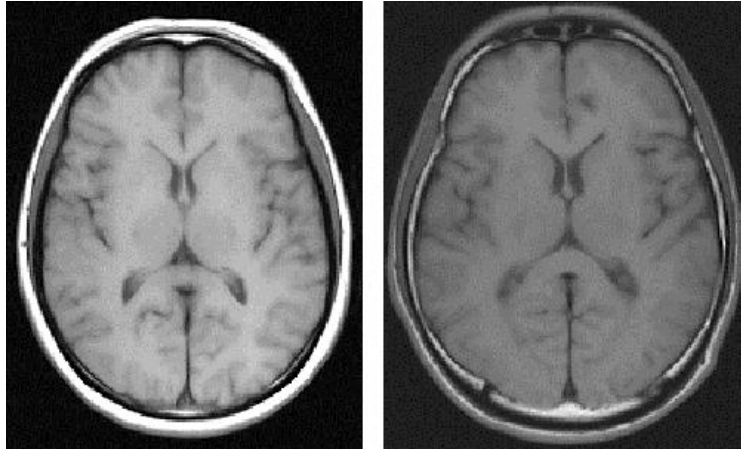


IV. Severe : Multiple high signal intensity area that reached confluency in the periventricular region and white matter.



## Appendix 2 : Ventricular dilatation

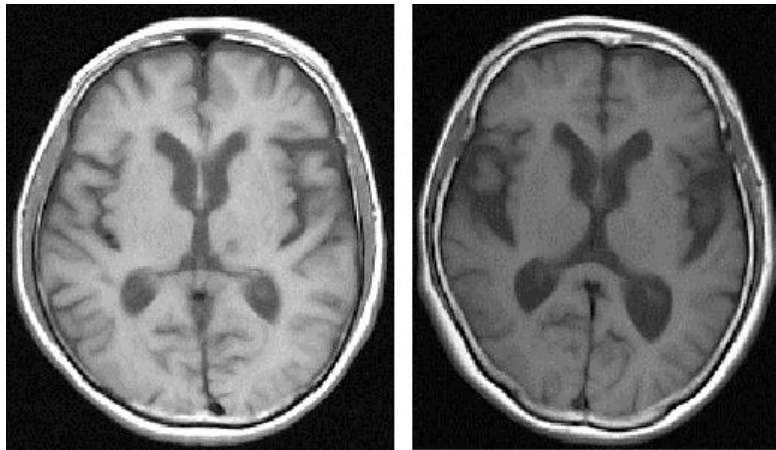
I. None



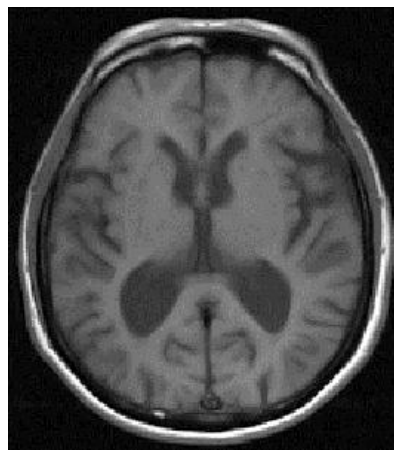
II. Mild



III. Moderate

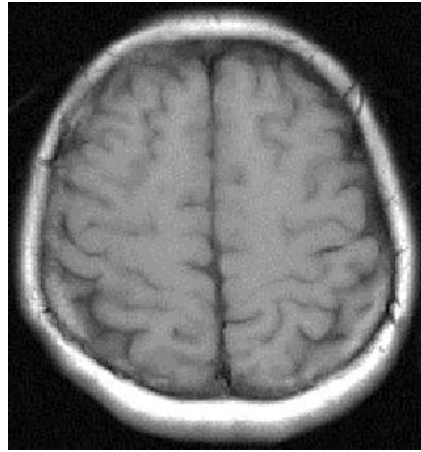


IV. Severe

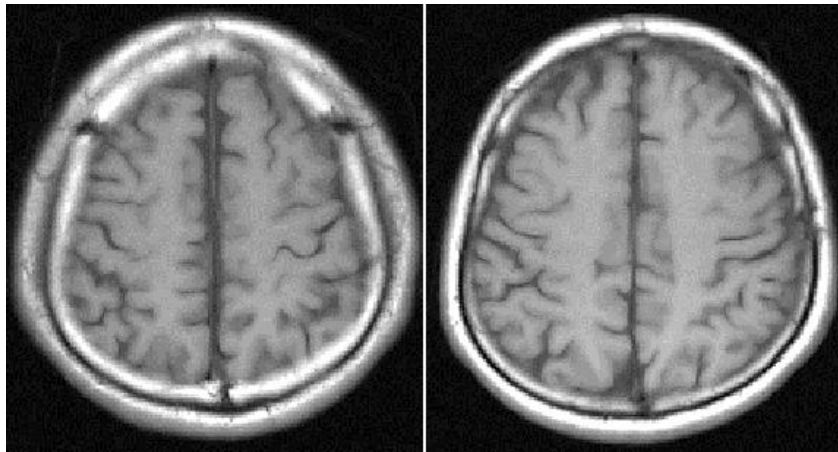


## Appendix 3 : Brain atrophy

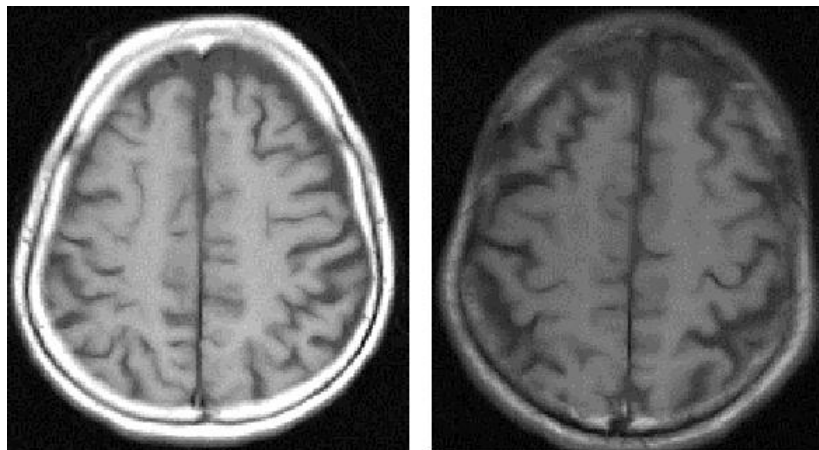
I. None



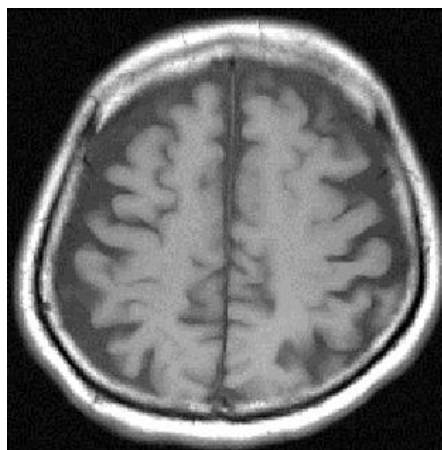
II. Mild



III. Moderate



IV. Severe



1.Findings and diagnosis

1) Periventricular hyperintensity (PVH)

Periventricular hyperintensity (PVH)

|              |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | Total |      |
|--------------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|
|              |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    |
| Not recorded | Male   | 0       | 0.0  | 0       | 0.0  | 0       | 0.0  | 0       | 0.0  | 0     | 0.0  |
|              | Female | 0       | 0.0  | 0       | 0.0  | 0       | 0.0  | 1       | 0.4  | 1     | 0.1  |
|              | Total  | 0       | 0.0  | 0       | 0.0  | 0       | 0.0  | 1       | 0.2  | 1     | 0.0  |
| None         | Male   | 281     | 97.6 | 247     | 88.8 | 161     | 59.0 | 98      | 35.5 | 787   | 70.6 |
|              | Female | 267     | 95.7 | 247     | 89.2 | 188     | 67.4 | 91      | 33.1 | 793   | 71.4 |
|              | Total  | 548     | 96.6 | 494     | 89.0 | 349     | 63.2 | 189     | 34.3 | 1580  | 71.0 |
| Mild         | Male   | 6       | 2.1  | 20      | 7.2  | 83      | 30.4 | 83      | 30.1 | 192   | 17.2 |
|              | Female | 10      | 3.6  | 28      | 10.1 | 56      | 20.1 | 88      | 32.0 | 182   | 16.4 |
|              | Total  | 16      | 2.8  | 48      | 8.6  | 139     | 25.2 | 171     | 31.0 | 374   | 16.8 |
| Moderate     | Male   | 1       | 0.3  | 11      | 4.0  | 23      | 8.4  | 85      | 30.8 | 120   | 10.8 |
|              | Female | 2       | 0.7  | 2       | 0.7  | 31      | 11.1 | 80      | 29.1 | 115   | 10.4 |
|              | Total  | 3       | 0.5  | 13      | 2.3  | 54      | 9.8  | 165     | 29.9 | 235   | 10.6 |
| Severe       | Male   | 0       | 0.0  | 0       | 0.0  | 6       | 2.2  | 10      | 3.6  | 16    | 1.4  |
|              | Female | 0       | 0.0  | 0       | 0.0  | 4       | 1.4  | 15      | 5.5  | 19    | 1.7  |
|              | Total  | 0       | 0.0  | 0       | 0.0  | 10      | 1.8  | 25      | 4.5  | 35    | 1.6  |

2) Ventricular dilatation

Ventricular dilatation

|          |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | Total |      |
|----------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|
|          |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    |
| None     | Male   | 242     | 84.0 | 172     | 61.9 | 113     | 41.4 | 34      | 12.3 | 561   | 50.3 |
|          | Female | 250     | 89.6 | 235     | 84.8 | 159     | 57.0 | 58      | 21.1 | 702   | 63.2 |
|          | Total  | 492     | 86.8 | 407     | 73.3 | 272     | 49.3 | 92      | 16.7 | 1263  | 56.8 |
| Mild     | Male   | 44      | 15.3 | 101     | 36.3 | 136     | 49.8 | 141     | 51.1 | 422   | 37.8 |
|          | Female | 27      | 9.7  | 41      | 14.8 | 103     | 36.9 | 161     | 58.5 | 332   | 29.9 |
|          | Total  | 71      | 12.5 | 142     | 25.6 | 239     | 43.3 | 302     | 54.8 | 754   | 33.9 |
| Moderate | Male   | 2       | 0.7  | 5       | 1.8  | 23      | 8.4  | 98      | 35.5 | 128   | 11.5 |
|          | Female | 2       | 0.7  | 1       | 0.4  | 17      | 6.1  | 55      | 20.0 | 75    | 6.8  |
|          | Total  | 4       | 0.7  | 6       | 1.1  | 40      | 7.2  | 153     | 27.8 | 203   | 9.1  |
| Severe   | Male   | 0       | 0.0  | 0       | 0.0  | 1       | 0.4  | 3       | 1.1  | 4     | 0.4  |
|          | Female | 0       | 0.0  | 0       | 0.0  | 0       | 0.0  | 1       | 0.4  | 1     | 0.1  |
|          | Total  | 0       | 0.0  | 0       | 0.0  | 1       | 0.2  | 4       | 0.7  | 5     | 0.2  |

3) Brain atrophy

Brain atrophy

|  |  | 40–49yr |   | 50–59yr |   | 60–69yr |   | 70–79yr |   | Total |   |
|--|--|---------|---|---------|---|---------|---|---------|---|-------|---|
|  |  | N       | % | N       | % | N       | % | N       | % | N     | % |

|          |        |     |      |     |      |     |      |     |      |      |      |
|----------|--------|-----|------|-----|------|-----|------|-----|------|------|------|
| None     | Male   | 269 | 93.4 | 233 | 83.8 | 155 | 56.8 | 72  | 26.1 | 729  | 65.4 |
|          | Female | 274 | 98.2 | 260 | 93.9 | 209 | 74.9 | 109 | 39.6 | 852  | 76.8 |
|          | Total  | 543 | 95.8 | 493 | 88.8 | 364 | 65.9 | 181 | 32.8 | 1581 | 71.1 |
| Mild     | Male   | 19  | 6.6  | 45  | 16.2 | 114 | 41.8 | 180 | 65.2 | 358  | 32.1 |
|          | Female | 4   | 1.4  | 17  | 6.1  | 68  | 24.4 | 153 | 55.6 | 242  | 21.8 |
|          | Total  | 23  | 4.1  | 62  | 11.2 | 182 | 33.0 | 333 | 60.4 | 600  | 27.0 |
| Moderate | Male   | 0   | 0.0  | 0   | 0.0  | 4   | 1.5  | 24  | 8.7  | 28   | 2.5  |
|          | Female | 1   | 0.4  | 0   | 0.0  | 2   | 0.7  | 13  | 4.7  | 16   | 1.4  |
|          | Total  | 1   | 0.2  | 0   | 0.0  | 6   | 1.1  | 37  | 6.7  | 44   | 2.0  |
| Severe   | Male   | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0    | 0.0  |
|          | Female | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0    | 0.0  |
|          | Total  | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0   | 0.0  | 0    | 0.0  |

4) Cerebrovascular disease (CVD)

Lacuna infarction

|                 |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | Total |      |
|-----------------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|
|                 |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    |
| None            | Male   | 286     | 99.3 | 268     | 96.4 | 236     | 86.4 | 201     | 72.8 | 991   | 88.9 |
|                 | Female | 277     | 99.3 | 271     | 97.8 | 261     | 93.5 | 227     | 82.5 | 1036  | 93.3 |
|                 | Total  | 563     | 99.3 | 539     | 97.1 | 497     | 90.0 | 428     | 77.7 | 2027  | 91.1 |
| Single lacuna   | Male   | 1       | 0.3  | 5       | 1.8  | 24      | 8.8  | 43      | 15.6 | 73    | 6.5  |
|                 | Female | 2       | 0.7  | 6       | 2.2  | 14      | 5.0  | 34      | 12.4 | 56    | 5.0  |
|                 | Total  | 3       | 0.5  | 11      | 2.0  | 38      | 6.9  | 77      | 14.0 | 129   | 5.8  |
| Multiple lacuna | Male   | 1       | 0.3  | 5       | 1.8  | 13      | 4.8  | 32      | 11.6 | 51    | 4.6  |
|                 | Female | 0       | 0.0  | 0       | 0.0  | 4       | 1.4  | 14      | 5.1  | 18    | 1.6  |
|                 | Total  | 1       | 0.2  | 5       | 0.9  | 17      | 3.1  | 46      | 8.3  | 69    | 3.1  |

Cerebral embolism

|              |        | 40–49yr |       | 50–59yr |      | 60–69yr |       | 70–79yr |      | Total |      |
|--------------|--------|---------|-------|---------|------|---------|-------|---------|------|-------|------|
|              |        | N       | %     | N       | %    | N       | %     | N       | %    | N     | %    |
| Embolism (–) | Male   | 288     | 100.0 | 277     | 99.6 | 273     | 100.0 | 273     | 98.9 | 1111  | 99.6 |
|              | Female | 278     | 99.6  | 276     | 99.6 | 278     | 99.6  | 272     | 98.9 | 1104  | 99.5 |
|              | Total  | 566     | 99.8  | 553     | 99.6 | 551     | 99.8  | 545     | 98.9 | 2215  | 99.6 |
| Embolism (+) | Male   | 0       | 0.0   | 1       | 0.4  | 0       | 0.0   | 3       | 1.1  | 4     | 0.4  |
|              | Female | 1       | 0.4   | 1       | 0.4  | 1       | 0.4   | 3       | 1.1  | 6     | 0.5  |
|              | Total  | 1       | 0.2   | 2       | 0.4  | 1       | 0.2   | 6       | 1.1  | 10    | 0.4  |

Cerebral thrombosis

|  |  | 40–49yr |   | 50–59yr |   | 60–69yr |   | 70–79yr |   | Total |   |
|--|--|---------|---|---------|---|---------|---|---------|---|-------|---|
|  |  | N       | % | N       | % | N       | % | N       | % | N     | % |

|                |        |     |       |     |      |     |       |     |      |      |      |
|----------------|--------|-----|-------|-----|------|-----|-------|-----|------|------|------|
| Thrombosis (-) | Male   | 288 | 100.0 | 274 | 98.6 | 268 | 98.2  | 263 | 95.3 | 1093 | 98.0 |
|                | Female | 278 | 99.6  | 276 | 99.6 | 279 | 100.0 | 266 | 96.7 | 1099 | 99.0 |
|                | Total  | 566 | 99.8  | 550 | 99.1 | 547 | 99.1  | 529 | 96.0 | 2192 | 98.5 |
| Thrombosis (+) | Male   | 0   | 0.0   | 4   | 1.4  | 5   | 1.8   | 13  | 4.7  | 22   | 2.0  |
|                | Female | 1   | 0.4   | 1   | 0.4  | 0   | 0.0   | 9   | 3.3  | 11   | 1.0  |
|                | Total  | 1   | 0.2   | 5   | 0.9  | 5   | 0.9   | 22  | 4.0  | 33   | 1.5  |

Cerebral hemorrhage

|                |        | 40–49yr |       | 50–59yr |      | 60–69yr |      | 70–79yr |      | Total |      |
|----------------|--------|---------|-------|---------|------|---------|------|---------|------|-------|------|
|                |        | N       | %     | N       | %    | N       | %    | N       | %    | N     | %    |
| Hemorrhage (-) | Male   | 288     | 100.0 | 277     | 99.6 | 272     | 99.6 | 275     | 99.6 | 1112  | 99.7 |
|                | Female | 278     | 99.6  | 276     | 99.6 | 278     | 99.6 | 273     | 99.3 | 1105  | 99.5 |
|                | Total  | 566     | 99.8  | 553     | 99.6 | 550     | 99.6 | 548     | 99.5 | 2217  | 99.6 |
| Hemorrhage (+) | Male   | 0       | 0.0   | 1       | 0.4  | 1       | 0.4  | 1       | 0.4  | 3     | 0.3  |
|                | Female | 1       | 0.4   | 1       | 0.4  | 1       | 0.4  | 2       | 0.7  | 5     | 0.5  |
|                | Total  | 1       | 0.2   | 2       | 0.4  | 2       | 0.4  | 3       | 0.5  | 8     | 0.4  |

Cerebrovascular disease (CVD)

|         |        | 40–49yr |      | 50–59yr |      | 60–69yr |      | 70–79yr |      | Total |      |
|---------|--------|---------|------|---------|------|---------|------|---------|------|-------|------|
|         |        | N       | %    | N       | %    | N       | %    | N       | %    | N     | %    |
| CVD (-) | Male   | 286     | 99.3 | 264     | 95.0 | 233     | 85.3 | 194     | 70.3 | 977   | 87.6 |
|         | Female | 274     | 98.2 | 269     | 97.1 | 259     | 92.8 | 216     | 78.5 | 1018  | 91.7 |
|         | Total  | 560     | 98.8 | 533     | 96.0 | 492     | 89.1 | 410     | 74.4 | 1995  | 89.7 |
| CVD (+) | Male   | 2       | 0.7  | 14      | 5.0  | 40      | 14.7 | 82      | 29.7 | 138   | 12.4 |
|         | Female | 5       | 1.8  | 8       | 2.9  | 20      | 7.2  | 59      | 21.5 | 92    | 8.3  |
|         | Total  | 7       | 1.2  | 22      | 4.0  | 60      | 10.9 | 141     | 25.6 | 230   | 10.3 |

2. Measurements

Total area of brain parenchyma (cm<sup>2</sup>)

|        | 40–49yr |       |     | 50–59yr |       |     | 60–69yr |       |     | 70–79yr |       |     | Total  |       |     |
|--------|---------|-------|-----|---------|-------|-----|---------|-------|-----|---------|-------|-----|--------|-------|-----|
|        | Mean    | SD    | N   | Mean    | SD    | N   | Mean    | SD    | N   | Mean    | SD    | N   | Mean   | SD    | N   |
| Male   | 1453.1  | 112.3 | 77  | 1400.8  | 117.7 | 72  | 1375.0  | 117.9 | 66  | 1320.6  | 120.4 | 71  | 1389.0 | 126.1 | 286 |
| Female | 1279.5  | 124.4 | 65  | 1253.3  | 82.9  | 77  | 1234.5  | 90.7  | 76  | 1222.5  | 89.3  | 69  | 1246.9 | 98.9  | 287 |
| Total  | 1373.6  | 146.1 | 142 | 1324.6  | 125.1 | 149 | 1299.8  | 125.4 | 142 | 1272.2  | 116.7 | 140 | 1317.8 | 133.7 | 573 |

Whole brain volume (cm<sup>3</sup>)

|        | 40–49yr |       |    | 50–59yr |       |    | 60–69yr |       |    | 70–79yr |       |    | Total  |       |     |
|--------|---------|-------|----|---------|-------|----|---------|-------|----|---------|-------|----|--------|-------|-----|
|        | Mean    | SD    | N  | Mean    | SD    | N  | Mean    | SD    | N  | Mean    | SD    | N  | Mean   | SD    | N   |
| Male   | 1380.4  | 106.7 | 77 | 1330.8  | 111.9 | 72 | 1306.2  | 112.0 | 66 | 1254.5  | 114.4 | 71 | 1319.6 | 119.8 | 286 |
| Female | 1215.6  | 118.2 | 65 | 1190.6  | 78.7  | 77 | 1172.8  | 86.1  | 76 | 1161.3  | 84.8  | 69 | 1184.5 | 93.9  | 287 |

|       |        |       |     |        |       |     |        |       |     |        |       |     |        |       |     |
|-------|--------|-------|-----|--------|-------|-----|--------|-------|-----|--------|-------|-----|--------|-------|-----|
| Total | 1305.0 | 138.8 | 142 | 1258.3 | 118.8 | 149 | 1234.8 | 119.1 | 142 | 1208.6 | 110.9 | 140 | 1251.9 | 127.0 | 573 |
|-------|--------|-------|-----|--------|-------|-----|--------|-------|-----|--------|-------|-----|--------|-------|-----|

#### Area of vermis in midsagittal slice (cm<sup>2</sup>)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 8.9     | 1.2 | 78  | 8.7     | 1.2 | 73  | 8.7     | 1.1 | 66  | 8.3     | 1.1 | 71  | 8.7   | 1.2 | 288 |
| Female | 8.3     | 1.1 | 66  | 8.4     | 1.1 | 79  | 8.3     | 1.1 | 76  | 8.0     | 1.1 | 70  | 8.2   | 1.1 | 291 |
| Total  | 8.6     | 1.2 | 144 | 8.5     | 1.2 | 152 | 8.5     | 1.1 | 142 | 8.1     | 1.1 | 141 | 8.4   | 1.2 | 579 |

#### Area of ventral pons in midsagittal slice (cm<sup>2</sup>)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 3.0     | 0.3 | 78  | 3.0     | 0.4 | 73  | 3.0     | 0.4 | 66  | 2.9     | 0.4 | 71  | 3.0   | 0.4 | 288 |
| Female | 2.8     | 0.3 | 66  | 2.8     | 0.3 | 79  | 2.8     | 0.3 | 76  | 2.8     | 0.3 | 70  | 2.8   | 0.3 | 291 |
| Total  | 2.9     | 0.3 | 144 | 2.9     | 0.4 | 152 | 2.9     | 0.4 | 142 | 2.9     | 0.4 | 141 | 2.9   | 0.4 | 579 |

#### Area of corpus callosum in midsagittal slice (cm<sup>2</sup>)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 5.5     | 0.7 | 78  | 5.4     | 0.7 | 73  | 5.3     | 0.8 | 66  | 4.9     | 0.9 | 71  | 5.3   | 0.8 | 288 |
| Female | 5.1     | 0.7 | 66  | 5.2     | 0.7 | 79  | 5.2     | 0.7 | 76  | 4.9     | 0.6 | 70  | 5.1   | 0.7 | 291 |
| Total  | 5.3     | 0.7 | 144 | 5.3     | 0.7 | 152 | 5.2     | 0.7 | 142 | 4.9     | 0.8 | 141 | 5.2   | 0.7 | 579 |

#### Cross-sectional area of skull in midsagittal slice (cm<sup>2</sup>)

|        | 40–49yr |      |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | Total |     |     |
|--------|---------|------|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD   | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 130.4   | 8.7  | 78  | 127.5   | 9.6 | 73  | 126.4   | 8.7 | 65  | 126.5   | 8.8 | 71  | 127.8 | 9.1 | 287 |
| Female | 120.5   | 9.0  | 66  | 119.6   | 7.2 | 79  | 118.6   | 8.0 | 76  | 119.3   | 7.7 | 70  | 119.5 | 7.9 | 291 |
| Total  | 125.9   | 10.1 | 144 | 123.4   | 9.3 | 152 | 122.1   | 9.2 | 141 | 122.9   | 9.0 | 141 | 123.6 | 9.5 | 578 |

#### Area of lateral ventricle (cm<sup>2</sup>)

|        | 40–49yr |     |     | 50–59yr |     |     | 60–69yr |     |     | 70–79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 7.5     | 3.4 | 78  | 9.0     | 3.6 | 72  | 10.8    | 4.3 | 66  | 13.4    | 4.5 | 71  | 10.1  | 4.5 | 287 |
| Female | 6.3     | 2.8 | 66  | 6.7     | 2.8 | 79  | 8.9     | 3.8 | 76  | 11.5    | 4.4 | 70  | 8.3   | 4.0 | 291 |
| Total  | 7.0     | 3.2 | 144 | 7.8     | 3.4 | 151 | 9.8     | 4.2 | 142 | 12.5    | 4.5 | 141 | 9.2   | 4.4 | 578 |

Area of brain parenchyma (cm )

|        | 40-49yr |      |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | Total |      |     |
|--------|---------|------|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|------|-----|
|        | Mean    | SD   | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD   | N   |
| Male   | 155.7   | 8.5  | 78  | 151.7   | 7.8 | 72  | 149.7   | 9.4 | 66  | 145.7   | 8.8 | 71  | 150.8 | 9.3  | 287 |
| Female | 144.9   | 8.6  | 66  | 141.1   | 7.7 | 79  | 139.4   | 7.6 | 76  | 137.5   | 6.7 | 70  | 140.7 | 8.1  | 291 |
| Total  | 150.7   | 10.1 | 144 | 146.2   | 9.4 | 151 | 144.2   | 9.9 | 142 | 141.6   | 8.8 | 141 | 145.7 | 10.1 | 578 |

Area of subarachnoid CSF (forward from the tip of lateral ventricle) (cm<sup>2</sup>)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 3.0     | 1.6 | 78  | 3.5     | 1.4 | 72  | 4.3     | 1.9 | 66  | 5.7     | 2.3 | 71  | 4.1   | 2.1 | 287 |
| Female | 2.2     | 1.1 | 66  | 2.7     | 1.3 | 79  | 3.4     | 1.7 | 76  | 3.9     | 1.6 | 70  | 3.1   | 1.6 | 291 |
| Total  | 2.7     | 1.4 | 144 | 3.1     | 1.4 | 151 | 3.8     | 1.8 | 142 | 4.8     | 2.2 | 141 | 3.6   | 1.9 | 578 |

Area of subarachnoid CSF (subarachnoid CSF from anterior horn to posterior horn) (cm<sup>2</sup>)

|        | 40-49yr |     |     | 50-59yr |     |     | 60-69yr |     |     | 70-79yr |     |     | Total |     |     |
|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|---------|-----|-----|-------|-----|-----|
|        | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean    | SD  | N   | Mean  | SD  | N   |
| Male   | 2.7     | 1.1 | 78  | 3.2     | 1.1 | 72  | 4.0     | 1.6 | 66  | 5.2     | 2.9 | 71  | 3.7   | 2.0 | 287 |
| Female | 1.9     | 0.9 | 66  | 2.3     | 1.0 | 79  | 3.0     | 1.1 | 76  | 3.7     | 1.6 | 70  | 2.8   | 1.4 | 291 |
| Total  | 2.4     | 1.1 | 144 | 2.7     | 1.1 | 151 | 3.5     | 1.5 | 142 | 4.5     | 2.4 | 141 | 3.2   | 1.8 | 578 |