

Subjects with Vascular dementia show different distributions of medial temporal atrophy on MRI as compared to subjects with Alzheimer's dementia

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Objective: To determine if patients with Vascular Dementia (VaD, diagnosed by modified NINDS-AIREN that required MRI in all subjects), Alzheimer's Disease (AD, by NINCDS-ADRDA) and age-matched normal controls have different distributions of hippocampal size.

Background: Hippocampal atrophy is a common finding in AD, but there have been limited studies of hippocampal size in VaD diagnosed by NINDS-AIREN criteria.

Design/method: MRI T1-weighted images were obtained in 283 patients screened for an ongoing clinical trial of donepezil in VaD. Clinically none had concurrent AD. For this analysis, the scans were reviewed and scored for medial temporal atrophy (MTA) using the Scheltens' scale (0-4, most severe is 4). In addition scans were assessed for cerebral infarction (presence/absence) and infarct size (large versus small). All ratings were performed by an experienced rater who was blind to the screen failure status of the subjects. Approximately two thirds met inclusion criteria and were enrolled in the ongoing, blinded therapeutic trial. Data from these patients were compared with that of 64 AD subjects and 75 normal controls (NC) from the MIRAGE study, who had previously been analyzed in the same manner by the same rater, who was also blind to diagnostic status.

Results: The mean MTA ratings for NC, VaD and AD subject groups were 0.8 ± 0.2 , 1.7 ± 0.2 , 2.8 ± 0.3 . The distribution of MTA severity scores also varied significantly across groups ($\chi^2=128$, $p < 0.0001$). Of NC, 92% had a score of 0-2; while 8% had a score of 3 and 4 (most severe atrophy). In contrast, of those with AD 40% scored 0-2 and 60% scored 3 or 4. The VaD group had a distinct pattern from either: only 29% had a high score of 3 and 4, while 71% had scores of 0-2. Of VaD subjects, those without any infarcts had a mean hippocampal atrophy rating of 1.8 versus 1.6 for those with small infarcts, and 1.7 for those with large infarcts ($p > 0.5$).

Conclusions: This population of VaD subjects diagnosed by modified NINDS-AIREN criteria shows a distinctly different pattern of hippocampal size distribution compared to AD subjects and NC. Nearly 70% of these VaD subjects had MTA scores below the range typically associated with AD arguing against coincident AD pathology within this group.