INTRODUCTION

- Cerebral microhemorrhages, although common among the elderly, are known to be related to the presence of amyloid in the brain, cognitive impairment and dementia severity.
- This work assesses the prevalence of microhemorrhages in ROSAS, a monocentric observational study which includes normal controls as well as MCI and AD subjects.

METHODS

Population

- The ROSAS study is a monocentric observational study which ran in Toulouse, France.
- Subjects aged 65 years or older were enrolled, including Normal Controls (NC), Mild Cognitive Impairment (MCI) and AD subjects.
- Subjects included Normal Controls (NC, n=51), MCI (n=41) and AD (n=61).

Data

- Susceptibility-Weighted (SWI) MRI scans were collected up to 3 times between Baseline and Month 48, at one site using a Philips Achieva 3T scanner, for consenting subjects (n=153, including 51 NC, 41 MCI and 61 AD).

MRI Data

- 3DTI data consisted of an axial VencBOLD High-Resolution sequence with a 1x1x1 mm^3 acquisition voxel size, reconstructed in each direction at ~0.5 mm.
- Minimum Intensity Projection (minIP) reconstructed slices were centrally generated (6 mm thick, with 3 mm overlap).

RESULTS

Image review and analysis

- Baseline SWI data (both native and minIP) were reviewed by one rater.
- Bleeds were categorized by location and size, as follows:
  - Deep: deep gray matter (basal ganglia and thalamus) and white matter of the corpus callosum, internal, external, and extreme capsule
  - Lobar: cortical gray matter and subcortical or periventricular white matter
  - Infratentorial: brain stem and cerebellum

- Bleeds were further classified by size, as being < 5 mm, between 5 and 10 mm (so-called large microhemorrhages) or > 10 mm.
- Descriptive statistics were computed for each group.
- Pearson Chi-Square tests were used to assess differences between groups.

- Microhemorrhages (≤10mm) were reported on 56.9% NC, 68.3% MCI and 65.6% AD.
- Infratentorial microhemorrhages were significantly more frequent in non-AD subjects.

- Only 2.0% NC had more than 4 microhemorrhages, as compared to 22.0% MCI and 11.5% AD.

- Significant differences between groups were found for the presence of infratentorial microhemorrhages (p<0.05) and of 4 microhemorrhages (p=0.01), and between NC and non-AD for the presence of large microhemorrhages (p=0.045) and >4 lobar microhemorrhages (p=0.029).

CONCLUSIONS

- A majority of ROSAS subjects from all clinical categories had 1 microhemorrhage.
- Multiple (>4), multiple lobar (>4), large (5-10 mm in size) and infratentorial microhemorrhages were significantly more frequent in non-NC subjects.
- Whether these findings could be a predictor for risk of conversion from MCI to AD will be investigated after the end of the study.