Magnetic resonance imaging identifies cytoarchitectonic subtypes of the normal human cerebral cortex.

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Abstract

BACKGROUND:
Magnetic Resonance Imaging (MRI) allows a detailed "in vivo" macroscopic study of the human brain; previously, it has been demonstrated that Fluid Attenuated Inversion Recovery (FLAIR) sequence shows higher signal intensity of cortices belonging to limbic structures.

PURPOSE:
To measure and compare signal intensities (SI) of cytoarchitectonically different cortical regions.

METHODS:
In 22 adult subjects, without psychiatric or neurological diseases, FLAIR sequence was performed in coronal slices, perpendicular to the main hippocampal axis. Signal intensity was measured, with a region-of-interest (ROI) function, in 12 different cortical regions. We compared these values and grouped the cortices into five groups: (1) limbic cortices, (2) paralimbic agranular cortices, (3) paralimbic granular cortices, (4) parietal-type neopallium, (5) frontal-type neopallium. A t-test for comparison of paired samples was performed, considering p<0.05 as statistically significant.

RESULTS:
We found statistically significant differences amongst the different groups, with the exception of groups 1 and 2, which did not show differences between them. No statistically significant differences were found among cortices belonging to the same group.

CONCLUSION:
Structural characteristics of the cerebral cortex cause changes in its signal intensity. Magnetic resonance imaging (FLAIR sequence) allows discrimination of different cytoarchitectonic areas of the human cerebral cortex.

Comment on

MRI cytoarchitectonics: the next level? [J Neurol Sci. 2003]