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

Bendersky M[1], Rugilo C, Kochen S, Schuster G, Sica RE.
Author information

- [1]Science and Technology Department, (UBACYT) Buenos Aires University, Paraguay 2155, Buenos Aires, Argentina. mbendersky@intramed.net.ar

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]