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## 4 Abstract

### **MR-morphometric investigation of the Capsula Interna within families affected with schizophrenia**

In the presented study the capsula interna of first degree relatives compared to independent controls was measured and analyzed on cranial MRI scans.

Therefore the capsula interna was bilaterally manually marked in transversal orientation on MRI scans of 99 study subjects by using the software program Analyze. Due to a lower signal-to-noise-ratio in the posterior limb the measurement was restricted to anterior inferior limb of the internal capsule. The thickness of the slices was 1.0 mm.

Out of this 99 brain MRI scans, 22 were of family members affected with schizophrenia, 34 of family members without schizophrenia and 43 of healthy control subjects from non-affected families. Standardized clinical examinations relevant for schizophrenia were performed on each subject.

To show reliability the two independent raters who did the measurement were blinded for diagnosis. On a selected sample the morphological measurement were performed twice.

The statistical analyses comparing the three diagnostic groups yielded significant main effects for right and left capsula interna volumes. A significant bilateral volume reduction of the capsula interna of family members without schizophrenia compared to control subjects was shown. The family members with schizophrenia showed volume reduction of the capsula interna compared to healthy controls, but only on the right side. In addition to that a significantly reduced maximal cross sectional area was found bilaterally in both diagnostic groups of family members compared to controls. In contrast the capsula interna length indicated only significant reduction on the right side of family members without schizophrenia compared to control subjects.

A correlation between the capsula interna volume and cognitive skills was detected. Better performance in specific cognitive tests was negatively correlated with the internal capsule volume. In other words smaller capsula interna volumes were associated with cognitive deficits.

In conclusion, the results of this morphometric study underline the hypothesis that disturbances of neuronal connectivity influenced by genetic vulnerability may contribute to the pathogenesis of schizophrenia.