

Gray and White Matter Morphology in Patients with Schizophrenia (abstract)

**Tiziano Colibazzi**

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Schizophrenia is associated with several localized anatomical abnormalities. Whether disturbances in gray or white matter primarily account for these abnormalities has not been established. We sought to determine the relative contributions of gray and white matter to these abnormalities by comparing fine-grained anatomy of the cortical mantle and underlying white matter between patients with schizophrenia and healthy controls.

We recruited 76 persons with schizophrenia and 57 healthy controls and we obtained measures of cortical surface morphology, which can be understood as local measures of volume at each point of the cortical surface. We also measured both cortical thickness and morphological features of the underlying white matter. We compared these three measures across diagnostic groups and assessed their correlations with PANSS scores, as well as with performance on the serial-position task (SPT), a measure of working memory.

We detected, in patients, indentations at corresponding locations of the cortical and white matter surfaces and significant thickening of the lateral temporal cortices bilaterally. Patients with worse performance on the SPT had a higher burden of reductions in local white matter volumes. Anatomical measures were not associated with clinical symptoms.

We conclude that reduced volumes of white matter, rather than reduced thickness of the overlying cortex, account for the reduced volumes reported in schizophrenia. Anatomical features of white matter, but not of cortical thickness, correlated with measures of working memory, suggesting the presence of a dose-response relationship between the degree of anatomical disturbances in white matter and neuropsychological phenotype.