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DOES ANTIPSYCHOTIC MEDICATION AFFECT WHITE MATTER IN SCHIZOPHRENIA AND BIPOLAR DISORDER? A REVIEW OF DIFFUSION TENSOR IMAGING LITERATURE

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Introduction: White matter (WM) abnormalities are considered integral to the pathophysiology of Schizophrenia (SZ) and Bipolar Disorder (BD), but there is ongoing uncertainty about the contribution of medication to these findings.

Objectives: Diffusion Tensor Imaging (DTI) is a neuroimaging technique that provides quantitative indices of the structural and orientational characteristics of WM. These indices include mean diffusivity (MD), which is a directionally averaged measure of the apparent diffusion coefficient, and fractional anisotropy (FA), which summarizes the orientational dependence of diffusivity. We wanted to determine if these indices are affected by antipsychotic medication.

Aims: Our aim was to examine the available literature in order to differentiate antipsychotic effects from disorder-specific WM abnormalities on DTI measures.

Methods: We conducted a systematic qualitative review of the DTI literature in Bipolar Disorder (BD) and Schizophrenia (SZ), between 1998 and 2010 and included only studies where the relationship between DTI measures and antipsychotic medication was explicitly examined and reported.

Results: We identified 40 studies in SZ and 8 in BD. All studies were cross-sectional and involved relatively small patient samples. 32 studies (80%) did not find any relationship between antipsychotic medication (dose, cumulative exposure) and FA or MD.

Conclusions: Current evidence does not indicate a major impact of antipsychotic treatment on DTI indices of WM integrity. However, the lack of longitudinal, within-subject designs is a major gap in the current literature.