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Cerebellar structure across early and chronic stages of illness in schizophrenia spectrum disorders and psychotic bipolar disorder

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Prominent neural models hypothesize that the cerebellum contributes to psychosis pathophysiology, especially schizophrenia, and may be developmental in nature. While a recent mega-analysis found reduced posterior ('cognitive'-related) cerebellar grey matter in individuals with schizophrenia, it remains unclear whether abnormalities are transdiagnostic and present in early-stage psychosis. Using a large, cross-sectional dataset, the current study evaluated cerebellar structure in 357 patients (249 schizophrenia-spectrum [SZ; 122 early-stage, 127 chronic], 108 bipolar with psychotic features [BP-P; 46 early-stage, 62 chronic]), and 217 non-psychiatric controls. The SUIT toolbox was used to optimize cerebellar analysis. One-way ANOVAs were computed for each region of interest (covariates=total intracranial volume, age, sex). Whole cerebellar grey matter volume did not differ between diagnostic or illness stage groups (full-sample Cohen's d=0.052). More granular models investigated lobular-specific grey matter volume and voxel-based morphometry across diagnostic groups or stages of illness, with negligible effect sizes. In contrast, cerebral regions exhibited small to medium effect sizes, consistent with the literature. The current findings suggest that cerebellar anatomical abnormalities in psychosis are relatively modest or highly heterogenous across samples. This highlights the need for additional large-scale studies to determine whether cerebellar anatomical abnormalities are associated with illness severity, including cognitive impairment, and connectivity differences.

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