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RISK AND RESILIENCE MARKERS: USE OF WHOLE-BRAIN STRUCTURAL MR SCANS TO PREDICT FAMILIAL RISK AND DISEASE EXPRESSION IN BIPOLAR DISORDER

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Aims: Conventional brain imaging analyses have confirmed that genetic risk and disease expression for Bipolar Disorder (BD) are associated with changes in brain structure. The current challenge is to develop new approaches to using brain imaging information to aid diagnostic classification and prediction of risk or resilience to BD.

Methods: We used a whole-brain classification approach employing a support vector machine (SVM) to the predictive value of structural MRI scans in two independent samples of BD patients and controls. Subsequently, using the same technique, we investigate whether it was possible to classify individuals at genetic risk for BD from BD patients and healthy controls.

Results: SVM correctly classified BD individuals at a specificity of 70% and a sensitivity of 81%. This approach differentiated individuals at risk for BD with a specificity of 73% and a sensitivity 64% of when compared to BD patients, and with a specificity 79% of and a sensitivity of 701% when compared to and controls.

Conclusions: Our results suggest that multivariate neuroanatomical pattern classification may provide a valuable tool in diagnosing BD and differentiating between affected and unaffected individuals given the same predisposing genotype.